Stanford University

Stanford, California
Reports on Federal Awards in Accordance with the Uniform Guidance
August 31, 2019
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I. Financial

Report of Independent Auditors

To the Board of Trustees of the
Leland Stanford Junior University

Report on the Consolidated Financial Statements

We have audited the accompanying consolidated financial statements of the Leland Stanford Junior University and its subsidiaries ("Stanford"), which comprise the consolidated statements of financial position as of August 31, 2019 and 2018, and the related consolidated statements of activities and cash flows for the years then ended, and the related notes to the financial statements.

Management's Responsibility for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on the consolidated financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on our judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, we consider internal control relevant to Stanford's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of Stanford's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the consolidated financial position of the Leland Stanford Junior University and its subsidiaries as of August 31, 2019 and 2018, and the changes in their net assets and their cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Emphasis of Matter

As discussed in Note 1 to the consolidated financial statements, Stanford changed the manner in which it presents net assets and reports certain aspects of its financial statements as a not-for-profit entity in 2019. Our opinion is not modified with respect to this matter.

Other Matters

Other Information

Our audit was conducted for the purpose of forming an opinion on the consolidated financial statements as a whole. The schedule of expenditures of federal awards for the year ended August 31, 2019 is presented for purposes of additional analysis as required by Title 2 U.S. *Code of Federal Regulations* Part 200, *Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards* (Uniform Guidance) and is not a required part of the consolidated financial statements. The information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the consolidated financial statements. The information has been subjected to the auditing procedures applied in the audit of the consolidated financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the consolidated financial statements or to the consolidated financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the schedule of expenditures of federal awards is fairly stated, in all material respects, in relation to the consolidated financial statements as a whole.

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated December 3, 2019 on our consideration of Stanford's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts and grant agreements and other matters for the year ended August 31, 2019. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing and not to provide an opinion on internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering Stanford's internal control over financial reporting and compliance.

PricewaterhouseCoopers LLP

December 3, 2019

CONSOLIDATED STATEMENTS OF FINANCIAL POSITION

At August 31, 2019 and 2018 (in thousands of dollars)

	2019	2018
ASSETS		
Cash and cash equivalents	$ 1,631,568	$ 1,199,367
Assets limited as to use	291,690	165,429
Accounts receivable, net	1,429,451	1,298,945
Prepaid expenses and other assets	448,772	329,700
Pledges receivable, net	1,469,686	1,518,486
Student loans receivable, net	51,998	60,336
Faculty and staff mortgages and other loans receivable, net	797,088	712,161
Investments at fair value, including securities pledged or on loan of $19,251 and $75,499 for 2019 and 2018, respectively	38,819,204	37,783,592
Plant facilities, net of accumulated depreciation	12,863,487	11,678,286
Works of art and special collections	—	—
TOTAL ASSETS	**$ 57,802,944**	**$ 54,746,302**
LIABILITIES AND NET ASSETS		
LIABILITIES:		
Accounts payable and accrued expenses	$ 2,518,600	$ 2,291,677
Accrued pension and postretirement benefit obligations	799,313	604,592
Liabilities associated with investments	758,161	708,629
Deferred income and other obligations	1,423,315	1,212,519
Notes and bonds payable	7,074,844	6,661,644
U.S. government refundable loan funds	39,745	39,678
TOTAL LIABILITIES	**12,613,978**	**11,518,739**
NET ASSETS:		
Without donor restrictions	27,065,691	25,591,149
With donor restrictions	18,123,275	17,636,414
TOTAL NET ASSETS	**45,188,966**	**43,227,563**
TOTAL LIABILITIES AND NET ASSETS	**$ 57,802,944**	**$ 54,746,302**

The accompanying notes are an integral part of these consolidated financial statements.

CONSOLIDATED STATEMENTS OF ACTIVITIES

For the years ended August 31, 2019 and 2018 (in thousands of dollars)

	2019	2018
NET ASSETS WITHOUT DONOR RESTRICTIONS		
OPERATING REVENUES:		
TOTAL STUDENT INCOME, NET	**$ 652,853**	**$ 635,020**
Sponsored support:		
Direct costs - University	850,779	801,534
Direct costs - SLAC National Accelerator Laboratory	545,359	580,314
Indirect costs	286,782	273,679
TOTAL SPONSORED SUPPORT	**1,682,920**	**1,655,527**
TOTAL HEALTH CARE SERVICES, primarily net patient service revenue	**7,050,672**	**6,302,278**
TOTAL CURRENT YEAR GIFTS IN SUPPORT OF OPERATIONS	**256,413**	**283,112**
Net assets released from restrictions:		
Payments received on pledges	153,478	142,632
Prior year gifts released from donor restrictions	75,852	55,943
TOTAL NET ASSETS RELEASED FROM RESTRICTIONS	**229,330**	**198,575**
Investment income distributed for operations:		
Endowment	1,319,170	1,254,315
Expendable funds pools and other investment income	263,641	254,492
TOTAL INVESTMENT INCOME DISTRIBUTED FOR OPERATIONS	**1,582,811**	**1,508,807**
TOTAL SPECIAL PROGRAM FEES AND OTHER INCOME	**807,021**	**728,076**
TOTAL OPERATING REVENUES	**12,262,020**	**11,311,395**
OPERATING EXPENSES:		
Salaries and benefits	6,892,410	6,328,491
Depreciation	701,163	656,104
Other operating expenses	4,045,911	3,854,513
TOTAL OPERATING EXPENSES	**11,639,484**	**10,839,108**
CHANGE IN NET ASSETS FROM OPERATING ACTIVITIES	**$ 622,536**	**$ 472,287**

The accompanying notes are an integral part of these consolidated financial statements.

CONSOLIDATED STATEMENTS OF ACTIVITIES, Continued

For the years ended August 31, 2019 and 2018 (in thousands of dollars)

	2019	2018
NET ASSETS WITHOUT DONOR RESTRICTIONS (continued)		
CHANGE IN NET ASSETS FROM OPERATING ACTIVITIES	**$ 622,536**	**$ 472,287**
NON-OPERATING ACTIVITIES:		
Increase in reinvested gains	1,222,273	1,159,554
Donor advised funds, net	8,518	(6,489)
Current year gifts not included in operations	3,251	3,064
Capital and other gifts released from restrictions	94,935	515,799
Pension and other postemployment benefit related changes other than net periodic benefit expense	(178,249)	99,844
Transfer to net assets with donor restrictions, net	(117,765)	(114,600)
Swap interest and change in value of swap agreements	(169,393)	56,211
Loss on extinguishment of debt	—	(47,613)
Other	(11,564)	(13,828)
NET CHANGE IN NET ASSETS WITHOUT DONOR RESTRICTIONS	**1,474,542**	**2,124,229**
NET ASSETS WITH DONOR RESTRICTIONS		
Gifts and pledges, net	590,419	575,294
Increase in reinvested gains	114,253	552,968
Change in value of split-interest agreements, net	3,827	24,115
Net assets released to operations	(252,362)	(218,239)
Capital and other gifts released to net assets without donor restrictions	(94,935)	(515,799)
Transfer from net assets without donor restrictions, net	117,765	114,600
Other	7,894	(3,746)
NET CHANGE IN NET ASSETS WITH DONOR RESTRICTIONS	**486,861**	**529,193**
NET CHANGE IN TOTAL NET ASSETS	**1,961,403**	**2,653,422**
Total net assets, beginning of year	43,227,563	40,574,141
TOTAL NET ASSETS, END OF YEAR	**$ 45,188,966**	**$ 43,227,563**

The accompanying notes are an integral part of these consolidated financial statements.

CONSOLIDATED STATEMENTS OF CASH FLOWS

For the years ended August 31, 2019 and 2018 (in thousands of dollars)

	2019	2018
CASH FLOW FROM OPERATING ACTIVITIES		
Change in net assets	$ 1,961,403	$ 2,653,422
Adjustments to reconcile change in net assets to net cash provided by operating activities:		
Depreciation	701,163	656,104
Amortization of bond premiums, discounts and other	(19,000)	(21,581)
Provision for doubtful accounts for health care services	—	63,097
Losses (gains) on disposal of plant facilities	(3,820)	4,350
Net gains on investments	(2,594,115)	(2,845,934)
Change in fair value of interest rate swaps	154,849	(74,093)
Change in split-interest agreements	28,549	44,979
Change in deferred tax asset and liability	15,350	—
Investment income for restricted purposes	(13,377)	(12,413)
Gifts restricted for long-term investments	(350,161)	(341,510)
Gifts of securities and properties	(28,660)	(31,093)
Loss on extinguishment of debt	—	47,613
Other	8,981	34,049
Premiums received from bond issuance	158,169	76,138
Changes in operating assets and liabilities:		
Accounts receivable	(126,210)	(99,051)
Pledges receivable, net	(54,166)	(14,565)
Prepaid expenses and other assets	(81,711)	(31,394)
Accounts payable and accrued expenses	191,274	141,623
Accrued pension and postretirement benefit obligations	194,721	(97,783)
Deferred income and other obligations	156,074	112,186
NET CASH PROVIDED BY OPERATING ACTIVITIES	**299,313**	**264,144**
CASH FLOW FROM INVESTING ACTIVITIES		
Additions to plant facilities, net	(1,920,325)	(1,879,306)
Change in assets limited as to use	(94,908)	285,606
Student, faculty and other loans:		
New loans made	(142,331)	(121,949)
Principal collected	66,276	69,831
Purchases of investments	(14,020,020)	(12,655,132)
Sales and maturities of investments	15,195,114	13,157,733
Sales (purchases) of investments with securities lending collateral, net	57,215	271,647
Change associated with short term investments	375,581	246,599
Swap settlement payments, net	(12,595)	(15,393)
NET CASH USED FOR INVESTING ACTIVITIES	**(495,993)**	**(640,364)**
CASH FLOW FROM FINANCING ACTIVITIES		
Gifts and reinvested income for restricted purposes	425,415	391,953
Proceeds from borrowing	1,001,445	1,247,671
Repayment of notes and bonds payable	(719,241)	(1,083,503)
Bond issuance costs and interest rate swaps	(2,135)	(6,783)
Contributions received for split-interest agreements	27,921	29,561
Payments made under split-interest agreements	(42,989)	(42,630)
Securities lending collateral (sold) received, net	(57,215)	(271,647)
Change in liabilities associated with investments	(11,237)	(71,322)
Other	6,917	12,169
NET CASH PROVIDED BY FINANCING ACTIVITIES	**628,881**	**205,469**
INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	**432,201**	**(170,751)**
Cash and cash equivalents, beginning of year	1,199,367	1,370,118
CASH AND CASH EQUIVALENTS, END OF YEAR	**$ 1,631,568**	**$ 1,199,367**
SUPPLEMENTAL DATA:		
Interest paid, net of capitalized interest	$ 200,064	$ 202,437
Cash collateral received under security lending agreements	$ 19,922	$ 77,137
Change in payables for plant facilities	$ (47,135)	$ 197,208

The accompanying notes are an integral part of these consolidated financial statements.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

1. Basis of Presentation and Significant Accounting Policies

BASIS OF PRESENTATION

The *Consolidated Financial Statements* include the accounts of The Leland Stanford Junior University ("Stanford University" or the "University"), Stanford Health Care (SHC), Lucile Salter Packard Children's Hospital at Stanford (LPCH) and other majority-owned or controlled entities of the University, SHC and LPCH. Collectively, all of these entities are referred to as "Stanford". All significant inter-entity transactions and balances have been eliminated in consolidation. Certain prior year amounts have been reclassified to conform to the current year's presentation. These reclassifications had no impact on total net assets or the change in total net assets.

University

The University is a private, not-for-profit educational institution, founded in 1885 by Senator Leland and Mrs. Jane Stanford in memory of their son, Leland Stanford Jr. A Board of Trustees (the "Board") governs the University. The University information presented in the *Consolidated Financial Statements* comprises all of the accounts of the University, including its institutes and research centers, and the Stanford Management Company.

SLAC National Accelerator Laboratory (SLAC) is a federally funded research and development center owned by the U.S. Department of Energy (DOE). The University manages and operates SLAC for the DOE under a management and operating contract; accordingly, the revenues and expenditures of SLAC are included in the *Consolidated Statements of Activities*, but SLAC's DOE funded assets and liabilities are not included in the *Consolidated Statements of Financial Position*. SLAC employees are University employees and participate in the University's employee benefit programs. The University holds some receivables from the DOE substantially related to reimbursement for employee compensation and benefits.

Hospitals

SHC and LPCH (the "Hospitals") are California not-for-profit public benefit corporations, each governed by a separate Board of Directors. The University is the sole member of each of these entities. SHC and LPCH support the mission of medical education and clinical research of the University's School of Medicine (SOM). Collectively, the SOM and Hospitals comprise Stanford Medicine. SHC and LPCH operate two licensed acute care and specialty hospitals on the Stanford campus and numerous physician clinics on the campus, in community settings and in association with regional hospitals in the San Francisco Bay Area and elsewhere in California. The University has partnered with SHC and LPCH, respectively, to establish physician medical foundations to support Stanford Medicine's mission of delivering quality care to the community and conducting research and education.

TAX STATUS

The University, SHC and LPCH are exempt from federal and state income taxes to the extent provided by Section 501(c)(3) of the Internal Revenue Code and equivalent state provisions, except with regard to unrelated business income which is taxable at corporate income tax rates, and provisions of the 2017 Tax Cuts and Jobs Act (TCJA).

In accordance with the guidance on accounting for uncertainty in income taxes, management regularly evaluates its tax positions and does not believe the University, SHC or LPCH have any uncertain tax positions that require disclosure in or adjustment to the *Consolidated Financial Statements*. The University, SHC and LPCH are subject to routine audits by taxing jurisdictions. Management of each of the consolidated entities believes they are no longer subject to income tax examinations for fiscal years prior to August 31, 2015.

The TCJA was signed into law on December 22, 2017. Under the TCJA, the University is subject to a 1.4% excise tax on its net investment income as defined under the Internal Revenue Code which, among other things, includes net investment income of certain related entities such as the Hospitals. In addition, the University and Hospitals are both subject to a 21% excise tax on annual compensation in excess of one million dollars paid to certain covered employees. These excise taxes became effective beginning fiscal year 2019. The University and Hospitals are also subject to a 21% income tax on certain expenses incurred in connection with providing qualified transportation benefits to employees. The tax is effective as of January 1, 2018.

The University has recorded a current tax liability and a deferred tax asset and liability based on reasonable estimates under the currently available guidance for the year ended August 31, 2019. The University continues to evaluate the impact of the TCJA on current and future tax positions.

BASIS OF ACCOUNTING

The *Consolidated Financial Statements* are prepared in accordance with accounting principles generally accepted in the United States of America ("U.S. GAAP"). These principles require management to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the *Consolidated Financial Statements* and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

For financial reporting purposes, net assets and revenues, expenses, gains and losses are classified into one of two categories - net assets without donor restrictions and net assets with donor restrictions based on the existence or absence of legal or donor-imposed restrictions (see *Note 11*).

Net assets without donor restrictions are expendable resources which are not subject to donor-imposed restrictions. These net assets may be designated by Stanford for specific purposes under internal operating and administrative arrangements or be subject to contractual agreements with external parties (see *Note 11*).

Net assets with donor restrictions include gifts, pledges and split-interest agreements (a) which by donor stipulation must be made available in perpetuity for investment or specific purposes, or (b) for which legal or donor imposed restrictions have not yet been met. Such restrictions include purpose restrictions where donors have specified the purpose for which the net assets are to be spent, or time restrictions imposed by donors, or appreciation and income on certain donor-restricted endowment funds that have not yet been appropriated for spending (see *Note 12*).

Contributions with donor restrictions that relate to Stanford's core activities and are received and expended or deemed expended based on the nature of donors' restrictions are classified as net assets without donor restrictions. Gifts and pledges subject to donor-imposed restrictions for specific purposes are recorded as net assets with donor restrictions and reclassified to net assets without donor restrictions upon expiration of time and purpose restrictions. Donor-restricted resources intended for capital projects are initially recorded as net assets with donor restrictions and then released and reclassified as net assets without donor restrictions when the asset is placed in service.

Transfers from net assets without donor restrictions to net assets with donor restrictions are primarily the result of donor redesignations or matching funds that are added to donor gift funds which then take on the same restrictions as the donor gift.

The operating activities of Stanford include the revenues earned and expenses incurred in the current year to support teaching, research, and health care. The non-operating activities of Stanford include increases in reinvested gains, current year gifts not included in operations, capital and other gifts released from restrictions, pension and other postemployment benefit related changes other than net periodic benefit expense, and certain other non-operating activities. All expenses are recorded as a reduction of net assets without donor restrictions with the exception of investment expenses that are required to be netted against investment returns.

CASH AND CASH EQUIVALENTS

Cash and cash equivalents included in the *Consolidated Statements of Financial Position* consist of U.S. Treasury bills, certificates of deposit, money market funds and all other short-term investments available for current operations with original maturities of 90 days or less at the time of purchase. These amounts are carried at amortized cost, which approximates fair value. Cash and cash equivalents that are held for investment purposes are classified as investments (see *Note 6*).

ASSETS LIMITED AS TO USE

Assets limited as to use consist of deferred compensation plan assets and tax-exempt bond proceeds as described below:

Deferred compensation plan assets

The University's custodians hold 457(b) non-qualified deferred compensation plan assets under a grantor trust which requires that they be used to satisfy plan obligations to participants and beneficiaries unless the University becomes insolvent. The funds are primarily invested in mutual funds, at the participants' discretion, which are valued based on quoted market prices (and exchange rates, if applicable) on the last trading date of the principal market on or before August 31.

Tax-exempt bond proceeds

The proceeds of tax-exempt bonds issued for the benefit of the University and trustee-held accounts holding proceeds of tax-exempt bonds issued for the benefit of SHC and LPCH are limited by the terms of indentures to use for qualified capital projects. The assets consist of cash and cash equivalents and short-term investments, recorded at cost, which approximates fair value.

ACCOUNTS AND LOANS RECEIVABLE

Accounts and loans receivable are carried at cost, less an allowance for doubtful accounts.

PREPAID EXPENSES AND OTHER ASSETS

Prepaid expenses consist of amounts paid in advance for goods or services that will be received after the end of the fiscal year including software licenses and travel programs. Other assets include cash collateral held for interest rate swaps (see *Note 8*), deferred tax assets (see *Note 1*), and restricted cash.

PLEDGES RECEIVABLE

Unconditional promises to give are included in the *Consolidated Financial Statements* as pledges receivable and are classified as donor restricted. Pledges recognized on or after September 1, 2009 are recorded at an applicable risk-adjusted discount rate commensurate with the duration of the donor's payment plan. Pledges recognized in periods prior to September 1, 2009 were recorded at a discount based on the U.S. Treasury rate. Conditional promises to give are not recorded until specified obligations or barriers, such as milestones or performance targets, are met.

INVESTMENTS

Investments are recorded at fair value. Gains and losses (realized and unrealized) on investments are recognized in the *Consolidated Statements of Activities* (see *Note 6*).

PLANT FACILITIES

Plant facilities are recorded at cost or, for donated assets, at fair value at the date of donation. Interest expense for construction financing, net of income earned on unspent proceeds, is capitalized as a cost of construction. Depreciation is computed using the straight-line method over the estimated useful lives of the assets. The useful lives used in calculating depreciation for the years ended August 31, 2019 and 2018 are as follows:

Land improvements	5-25 years
Buildings and building improvements	3-50 years
Furniture, fixtures and equipment	3-20 years
Utilities	5-40 years

WORKS OF ART AND SPECIAL COLLECTIONS

Works of art, historical treasures, literary works and artifacts, which are preserved and protected for educational, research and public exhibition purposes, are not capitalized. Donations of such collections are not recorded for financial statement purposes. Purchases of collection items are recorded as operating expenses in the period in which they are acquired. Proceeds from sales of such items are used to acquire other items for the collections.

DONATED ASSETS

Donated assets, other than works of art and special collections, are recorded at fair value at the date of donation. Undeveloped land, including land acquired under the original endowment to the University from Senator Leland and Mrs. Jane Stanford, is reported at fair value as of the date of acquisition. Under the terms of the original founding grant, a significant portion of University land may not be sold.

DONOR ADVISED FUNDS

The University receives gifts from donors under donor advised fund (DAF) agreements. These funds are owned and controlled by the University and are separately identified by donor. A significant portion of the gift must be designated to the University. At August 31, 2019 and 2018, approximately $509.1 million and $491.7 million, respectively, of DAFs may be used to support other approved charities; the donors have advisory privileges with respect to the distribution of these funds.

Current year gifts under the DAF agreements are included in the *Consolidated Statements of Activities* as "donor advised funds, net" at the full amount of the gift. Transfers of funds to other charitable organizations are included in the *Consolidated Statements of Activities* as a reduction to "donor advised funds, net" at the time the transfer is made.

SPLIT-INTEREST AGREEMENTS

Split-interest agreements consist of arrangements with donors where Stanford has an interest in the assets and receives benefits that are shared with other beneficiaries. Stanford's split-interest agreements with donors, for which Stanford serves as trustee, consist primarily of irrevocable charitable remainder trusts, charitable gift annuities, pooled income funds, perpetual trusts and charitable lead trusts. Assets are invested and payments are made to donors or other beneficiaries in accordance with the respective agreements. Contribution revenues are recognized at the date the agreements are established. The fair value of the estimated future payments to beneficiaries under these agreements is recorded as a liability.

The assets held under split-interest agreements, where the University is the trustee, were $844.4 million and $823.1 million at August 31, 2019 and 2018, respectively, and were recorded in specific investment categories. The assets held under split-interest agreements, where LPCH is the trustee, were $11.4 million and $11.2 million at August 31, 2019 and 2018, respectively, and were recorded in specific investment categories. Liabilities for the discounted present value of any income beneficiary interest are reported in "liabilities associated with investments" in the *Consolidated Statements of Financial Position*. At August 31,

2019 and 2018, the University used discount rates of 2.2% and 3.4%, respectively, based on the Charitable Federal Midterm Rate. The LPCH discount rate used during the years ended August 31, 2019 and 2018 was 1.8% and 2.9%, respectively, determined using the T-bill rate.

Included in assets held under split-interest agreements are amounts held to meet legally mandated annuity reserves of $27.2 million and $26.6 million as of August 31, 2019 and 2018 respectively, as required by California state law.

For irrevocable split-interest agreements whose assets are held in trusts not administered by the University, Stanford recognizes the estimated fair value of its beneficial interest in the trust assets and the associated gift revenue when reported to Stanford. These split-interest agreements are recorded in the "assets held by other trustees" category of "investments" in the *Consolidated Statements of Financial Position* as described in *Note 6*.

During fiscal years 2019 and 2018, the discounted present value of new University gifts subject to split-interest agreements, net of any income beneficiary share, was $16.9 million and $20.9 million, respectively, and was included in net assets with donor restrictions as "gifts and pledges, net" in the *Consolidated Statements of Activities*. Actuarial gains or losses were included in "change in value of split-interest agreements, net" in the *Consolidated Statements of Activities*.

DEFERRED INCOME AND OTHER OBLIGATIONS

Deferred income and other obligations consist of advance payments of student tuition, student room and board, sponsored support, and support of other operating programs. Revenue is recognized as it is earned or as the associated conditions are satisfied. In addition, the University records other deferred income and obligations as described below.

Deferred Rental Income

As part of its investment portfolio, the University holds certain investment properties that it leases to third parties under non-cancellable leases. In some lease transactions with properties in the Stanford Research Park and other properties, including the Stanford Shopping Center, prepaid rent is received, recorded as deferred rental income and amortized over the term of the lease (see also the *Future Minimum Rental Income* section in *Note 6*). As of August 31, 2019 and 2018, deferred rental income was $704.3 million and $601.9 million, respectively.

457(b) Deferred Compensation Plan

The University offers a non-qualified deferred compensation plan under Internal Revenue Code 457(b) to a select group of highly compensated employees. There is no University contribution related to the plan. The University has recorded both an asset and a liability related to the plan of $196.8 million and $165.4 million as of August 31, 2019 and 2018, respectively; the assets are included in "assets limited as to use" in the *Consolidated Statements of Financial Position*.

Repurchase Obligations

In an effort to provide affordable housing, certain residential units are offered to eligible faculty and staff under long-term restricted ground leases. These units are located on or in close proximity to Stanford's campus. The cost of the units that are constructed or purchased by the University is included in "plant facilities, net of accumulated depreciation" in the *Consolidated Statements of Financial Position*.

The University has the obligation to repurchase certain residential units when specified triggering events occur. As of August 31, 2019 and 2018, Stanford has recognized a net repurchase obligation of $86.5 million and $63.2 million, respectively, to repurchase its interests in these residential units, net of home mortgage financing assistance provided by the University of $167.4 million and $117.9 million, respectively (see *Note 5*). The change in the repurchase obligation and the original purchase price is recorded as interest accretion

and is reflected in "other operating expenses" in the *Consolidated Statements of Activities*. For the years ended August 31, 2019 and 2018, interest accretion was $6.9 million and $1.5 million, respectively.

Asset Retirement Obligations

Asset retirement obligations are legal obligations associated with the retirement of long-lived assets. These liabilities are initially recorded at fair value and the related asset retirement costs are capitalized at the same amount as the liability. Asset retirement costs are subsequently amortized over the useful lives of the related assets and the obligations are increased based on an appropriate discount rate. As of August 31, 2019 and 2018, SHC had asset retirement obligations of $100.6 million and $97.2 million, respectively.

SELF-INSURANCE

The University self-insures at varying levels for unemployment, disability, workers' compensation, property losses, certain health care plans and general and professional liability losses. SHC and LPCH self-insure at varying levels for health care plans, workers' compensation and, through their captive insurance company, for professional liability losses. In some cases, third-party insurance is purchased to cover liabilities in excess of self-insured retentions. Estimates of retained self-insured losses are reserved and accrued.

INTEREST RATE EXCHANGE AGREEMENTS

The University and SHC have entered into several interest rate exchange agreements to reduce the effect of interest rate fluctuation on their variable rate revenue bonds and notes. Current accounting guidance for derivatives and hedges requires entities to recognize all derivative instruments at fair value. The University and SHC do not designate and qualify their derivatives for hedge accounting; accordingly, any changes in the fair value (i.e. gains or losses) flow directly to the *Consolidated Statements of Activities* as a non-operating activity in "swap interest and change in value of swap agreements." The settlements (net cash payments less receipts) under the interest rate exchange agreements are also recorded in the *Consolidated Statements of Activities* in "swap interest and change in value of swap agreements."

The University has also entered into interest rate exchange agreements to reduce the effect of interest rate fluctuations of certain investment positions (see *Note 8*).

REVENUE

Student income and financial aid

"Student income, net" reported in the *Consolidated Statements of Activities* consists of tuition, room and board, and other student fees from undergraduate and graduate students which are recognized as revenue ratably during the fiscal year in which the academic services are rendered. The University also provides financial aid in the form of scholarship and fellowship grants that cover a portion of tuition, room and board, and other student fees; this financial assistance is reflected as a reduction of student income. Student payments are due at the beginning of each academic term. Payments received for future academic terms are recorded as deferred income and totaled $47.0 million and $55.8 million for the years ended August 31, 2019 and 2018, respectively. These payments are recognized in the subsequent fiscal year. The following table presents student income, net of financial aid, for the years ended August 31, in thousands of dollars:

	2019	2018
Student income:		
Undergraduate programs	$ 383,776	$ 368,383
Graduate programs	385,712	374,857
Room and board	205,422	195,225
Student financial aid	(322,057)	(303,445)
TOTAL STUDENT INCOME, NET	**$ 652,853**	**$ 635,020**

In addition to student financial aid, the University also provided other graduate support in the form of stipends, teaching and research assistantships, and related allowances for tuition. These amounts are reflected in operating expenses.

Sponsored Support

The University conducts substantial research pursuant to contracts and grants from the federal government, state and local governments, private corporations, foundations and others. Sponsored support earned from the federal government (including SLAC) is the largest segment of sponsored support. For both years ended August 31, 2019 and 2018, federal sponsored support was $1.3 billion. The Office of Naval Research is the University's cognizant federal agency for determining indirect cost rates charged to federally sponsored agreements. It is supported by the Defense Contract Audit Agency, which has the responsibility for auditing direct and indirect charges under those agreements.

The majority of sponsored support is contribution revenue and is recognized when any sponsor-imposed conditions have been met, typically when qualifying expenditures are incurred. Sponsored contribution revenue for the year ended August 31, 2019 was $993.6 million.

Other sponsored arrangements are considered exchange transactions and revenue is recognized in accordance with the terms of each contract or grant which are primarily based on costs incurred, completion of milestones, or other obligations as specified in the contracts. For the year ended August 31, 2019, the University recognized $143.9 million in revenue from exchange contracts.

SLAC is managed and operated by the University for the DOE under a management and operating contract, which is considered to be an exchange transaction. The University operates SLAC and the DOE is obligated to pay for allowable operating costs. The University recognizes revenue from the DOE as costs are incurred in the management and operation of SLAC per the terms of the contract. Revenue of $545.4 million and $580.3 million was recognized for the years ended August 31, 2019 and 2018, respectively.

Deferred income of $162.8 million and $191.1 million was recorded at August 31, 2019 and 2018, respectively, for payments received from sponsors that have not been spent. During the year ended August 31, 2019, $114.3 million of revenue was recognized that was included in the prior year deferred income balance. In addition, as of August 31, 2019, the University had been awarded $993.8 million in sponsored support for which the conditions to recognize revenue have not been met. These are conditional contributions and are not recorded in the *Consolidated Financial Statements*.

Health Care Services

"Total health care services" is reported in the *Consolidated Statements of Activities* at the estimated net realizable amounts from patients, third-party payers, and others for services rendered (collectively, "patient care revenue"). Estimated net realizable amounts represent amounts due, net of price concessions. Price concessions are based on management's assessment of expected net collections considering economic conditions, historical experience, trends in health care coverage and other collection indicators. SHC and LPCH derive a majority of patient care revenues from contractual agreements with Medicare, Medi-Cal and other third-party payers. Payments under these agreements and programs are based on a variety of payment models (see *Note 13*). Health care revenue is recognized as services are rendered either at a point in time or, for inpatient acute care services, over time generally from admission to discharge. Generally, patients and third-party payers are billed several days after services are performed or shortly after discharge. All health care revenue relates to contracts with customers with a duration of less than one year.

The University has entered into various operating agreements with SHC and LPCH for the professional services of School of Medicine faculty members, and for non-physician services such as telecommunications, facilities, and other services. The payments by the Hospitals to the University for professional services are eliminated in consolidation.

SHC and LPCH provide care to patients who meet certain criteria under their charity care policies without charge or at amounts less than their established rates. The Hospitals do not record revenue for amounts determined to qualify as charity care (see *Note 13*).

Gifts

Gifts are contributions primarily received from donors such as alumni and other private individuals, trusts, and foundations. Gifts may be designated by donors for specific purposes; accordingly, they are recognized in the period received in the appropriate net asset category based on the presence or absence of donor restrictions on their use. Contributions designated for the acquisition of plant facilities and long-term investments are initially reported in net assets with donor restrictions.

Gifts are considered conditional if the terms of the agreement require Stanford to return funds if certain specified obligations, or barriers, are not met such as milestones and performance targets. Conditional gifts are not recorded until the obligations or barriers are met.

Special Program Fees and Other Income

Special program fees and other income consists of several other exchange contracts including instruction fees for professional education programs, membership affiliation fees, rental income, conference trip revenue, distributions from the Pac-12 Conference, Stanford Blood Center fees, and various other types of income. Depending on the program, revenue is recognized at a point in time or over time as obligations are met.

RECENT ACCOUNTING PRONOUNCEMENTS

Periodically, the Financial Accounting Standards Board (FASB) issues updates to the Accounting Standards Codification (ASC) which impact Stanford's financial reporting and related disclosures. The following paragraphs summarize relevant updates. Unless otherwise noted, Stanford is currently evaluating the impact that these updates will have on the *Consolidated Financial Statements*.

Works of art and special collections

Accounting Standards Update (ASU) 2019-03, FASB Issue Date: March 2019, Effective Date: Fiscal Year 2021
The ASU modifies the definition of the term "collections" so that they are subject to an organizational policy that stipulates the use of proceeds from collection items that are sold to be for the acquisition of new collection items, the direct care of existing collections, or both.

Fair value

ASU 2018-13, FASB Issue Date: August 2018, Effective Date: Fiscal Year 2021
The ASU adds, modifies, and removes certain fair value measurement disclosure requirements. The portion of this guidance that modifies and removes fair value disclosure requirements was early adopted in fiscal year 2019.

ASU 2016-01, FASB Issue Date: January 2016, Effective Date: Fiscal Year 2020
The ASU eliminates the requirement to disclose the fair value of financial instruments measured at cost and requires equity investments (except those accounted for under the equity method of accounting) to be measured at fair value with changes in fair value recognized in net income. The portion of this guidance that eliminates the requirement to disclose the fair value of financial instruments measured at cost (such as the fair value of debt) has been early adopted in fiscal year 2019. The remaining guidance is not expected to have a material impact on the *Consolidated Financial Statements*.

Defined benefit plan disclosures

ASU 2018-14, FASB Issue Date: August 2018, Effective Date: Fiscal Year 2022

The ASU adds, removes, and clarifies disclosure requirements related to defined benefit pension and other postretirement plans. The new guidance was evaluated and will not have a material impact on the *Consolidated Financial Statements*.

Cloud computing arrangements

ASU 2018-15, FASB Issue Date: In August 2018, Effective Date: Fiscal Year 2022

The ASU allows capitalization of implementation costs incurred in a cloud computing arrangement in a manner that is consistent with the capitalization of implementation costs incurred to develop or obtain internal-use software.

Pension service costs

ASU 2017-07, FASB Issue Date: In March 2017, Effective Date: Fiscal Year 2020

The ASU requires that an employer report the service cost component of pension costs in the same line item as employee compensation costs within operating income. The other components of net benefit cost are required to be presented as "non-operating activities", and will not be eligible for capitalization. The new guidance was evaluated and will not have a material impact on the *Consolidated Financial Statements*.

Statement of cash flows

ASU 2016-18, FASB Issue Date: November 2016, Effective Date: Fiscal Year 2020

The ASU requires that the amounts generally described as restricted cash and restricted cash equivalents should be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total amounts shown on the statement of cash flows. The new guidance was evaluated and will not have a material impact on the *Consolidated Financial Statements*.

ASU 2016-15, FASB Issue Date: August 2016, Effective Date: Fiscal Year 2020

The ASU improves consistency of how certain transactions are classified across industries in the statement of cash flows.

Not-for-profit reporting

ASU 2016-14, FASB Issue Date: August 2016, Effective Date: Fiscal Year 2019

The ASU modifies Not-for Profit (NFP) reporting requirements by changing the way NFPs classify net assets and results in significant changes to financial reporting and disclosures for NFPs. The standard requires Stanford to reclassify its net assets (i.e., unrestricted, temporarily restricted, and permanently restricted) into two categories: net assets without donor restrictions and net assets with donor restrictions, among other requirements. The guidance also enhances disclosures about the composition of net assets, liquidity and expenses by both natural and functional classification. There is no significant impact to total net assets or total expenses from these changes. As a result of adopting this standard, net assets as of August 31, 2018, in thousands of dollars, have been reclassified as follows:

2018	ASU 2016-14 RECLASSIFICATIONS		
NET ASSETS CLASSIFICATIONS	WITHOUT DONOR RESTRICTIONS	WITH DONOR RESTRICTIONS	TOTAL NET ASSETS
As previously presented:			
Unrestricted	$ 25,589,701	$ —	$ 25,589,701
Temporarily restricted	—	9,701,287	9,701,287
Permanently restricted	—	7,936,575	7,936,575
TOTAL NET ASSETS	$ 25,589,701	$ 17,637,862	$ 43,227,563
Reclassification of underwater endowment	1,448	(1,448)	—
TOTAL NET ASSETS, REVISED	**$ 25,591,149**	**$ 17,636,414**	**$ 43,227,563**

Leases

ASU 2016-02, FASB Issue Date: February 2016, Effective Date: Fiscal Year 2020

The ASU requires lessees to recognize operating and financing lease liabilities and corresponding right-of use assets in the *Statements of Financial Position*.

Revenue recognition

ASU 2014-09, FASB Issue Date: May 2014, Effective Date: Fiscal Year 2019

The ASU improves consistency of revenue recognition practices across industries for economically similar transactions. Subsequently, the FASB has issued several amendments and updates to the original standard. The core principle is that an entity recognizes revenue for goods or services to customers in an amount that reflects the consideration it expects to receive in return. The guidance also requires expanded disclosures. Stanford adopted this standard in fiscal year 2019 using the modified retrospective approach. Stanford elected to apply the standard only to contracts that were not completed as of August 31, 2018, therefore, comparative information has not been adjusted and continues to be reported under the previous revenue recognition guidance. The adoption of this guidance did not have a material impact to Stanford's *Consolidated Financial Statements*.

ASU 2018-08, FASB Issue Date: June 2018, Effective Date: Fiscal Year 2019

The ASU assists entities in (1) evaluating whether transactions should be accounted for as contributions (nonreciprocal transactions) or as exchange (reciprocal) transactions and (2) determining whether a contribution is conditional. Stanford adopted this standard in fiscal year 2019 using the modified prospective approach and it did not have a material impact to Stanford's *Consolidated Financial Statements*.

2. Financial Assets and Liquid Resources

OVERVIEW

Stanford closely monitors its liquidity requirements and structures its financial assets to meet its short- and long-term needs and contractual commitments. To meet these needs, Stanford holds investments in various pools or in specific assets with varying degrees of liquidity, as well as having an authorized short-term commercial paper program. Stanford also has access to additional short-term financing facilities such as revolving lines of credit that can be available for unexpected liquidity needs (see *Note 10*).

OPERATIONS

The University, SHC and LPCH each manage their own operating cash through short-term investment pools. The primary investment objective for these funds is to preserve the principal value of the portfolio while meeting the liquidity needs of each of the entities. Cash flows vary seasonably during the year due to a variety of factors including timing of donor contributions, the University's academic calendar and the Hospitals' patient admission cycles. For working capital purposes, cash is managed by matching the timing of inflows and outflows as closely as possible, combined with active use of cash forecasting models to manage investment timing. Operating liquidity is tracked daily and reported weekly to provide management visibility. As noted above, back up borrowing facilities are also available to meet working capital needs.

MERGED POOL

The Merged Pool (MP) (see *Note 7*) is the primary investment pool for endowment and other long-term funds for the University and the Hospitals. Approximately 20% of the MP consists of liquid investments, with the balance representing investments which are generally subject to constraints which either limit Stanford's ability to withdraw such capital or limit the amounts available for withdrawal at given redemption dates (see *Note 6*). The MP further maintains sufficient liquidity to distribute the annual endowment payout in support of University operating expenditures, and to meet unfunded commitments associated with certain alternative investments (see *Note 6*). It is not the intention of the University to utilize its financial assets without donor restrictions-including board designated endowment funds-that are invested for the long-term for unplanned operating commitments; however, amounts could be made available from these sources if necessary, except for those underlying investments with lock-up provisions as discussed in *Note 6*.

Financial assets and liquid resources available within one year of the balance sheet date at August 31, 2019 in thousands of dollars, are as follows:

	UNIVERSITY	SHC	LPCH	CONSOLIDATED
2019				
Financial assets:				
Cash and cash equivalents	$ 856,553	$ 505,509	$ 269,506	$ 1,631,568
Assets limited as to use	94,896	—	—	94,896
Accounts receivable, net	235,153	685,425	427,956	1,348,534
Pledges receivable available for operations	82,947	—	8,273	91,220
Investments available for current use	385,376	1,049,485	588,875	2,023,736
Endowment payout in support of operations	1,362,000	—	—	1,362,000
Financial assets available to meet cash needs for general expenditure within one year	3,016,925	2,240,419	1,294,610	6,551,954
Liquid resources available for use:				
Taxable commercial paper	500,000	—	—	500,000
Tax-exempt commercial paper	300,000	—	—	300,000
Revolving credit facilities	369,430	200,000	170,000	739,430
TOTAL FINANCIAL ASSETS AND LIQUID RESOURCES AVAILABLE WITHIN ONE YEAR	**$4,186,355**	**$2,440,419**	**$1,464,610**	**$8,091,384**

3. Accounts Receivable

Accounts receivable, net of allowances for doubtful accounts, at August 31, 2019 and 2018, in thousands of dollars, are as follows:

	UNIVERSITY	SHC	LPCH	CONSOLIDATED
2019				
U.S. government sponsors	$ 109,218	$ —	$ —	$ 109,218
Non-federal sponsors and programs	79,871	7,510	—	87,381
Accrued interest on investments	13,669	—	—	13,669
Student	6,882	—	—	6,882
Patient and third-party payers:				
Blue Cross	—	175,161	101,414	276,575
Blue Shield	—	68,255	36,900	105,155
Medicare	—	86,861	2,550	89,411
Aetna	—	77,419	32,521	109,940
United Health	—	67,873	25,543	93,416
Medi-Cal	—	7,774	67,161	74,935
Other managed care and payers	—	202,082	134,744	336,826
Other	41,850	58,777	27,123	127,750
	251,490	751,712	427,956	1,431,158
Less allowance for doubtful accounts	(1,707)	—	—	(1,707)
ACCOUNTS RECEIVABLE, NET	**$ 249,783**	**$ 751,712**	**$ 427,956**	**$ 1,429,451**
2018				
U.S. government sponsors	$ 119,245	$ —	$ —	$ 119,245
Non-federal sponsors and programs	85,797	28,711	22,990	137,498
Pending trades of securities	11,318	—	—	11,318
Accrued interest on investments	17,934	—	—	17,934
Student	7,940	—	—	7,940
Patient and third-party payers:				
Blue Cross	—	176,858	84,585	261,443
Blue Shield	—	76,401	29,163	105,564
Medicare	—	114,210	1,419	115,629
Medi-Cal	—	17,159	43,740	60,899
Other managed care and payers	—	446,731	141,985	588,716
Other	44,536	18,479	32,317	95,332
	286,770	878,549	356,199	1,521,518
Less allowance for doubtful accounts	(1,732)	(208,282)	(12,559)	(222,573)
ACCOUNTS RECEIVABLE, NET	**$ 285,038**	**$ 670,267**	**$ 343,640**	**$ 1,298,945**

4. Pledges Receivable

Pledges are recorded at discounted rates ranging from 1.2% to 5.7%. At August 31, 2019 and 2018, pledges receivable, net of discounts and allowances, in thousands of dollars, are as follows:

	UNIVERSITY	SHC	LPCH	ELIMINATIONS	CONSOLIDATED
2019					
One year or less	$ 241,014	$ 29,691	$ 27,588	$ (16,301)	$ 281,992
Between one year and five years	889,219	33,348	107,009	(34,559)	995,017
More than five years	347,931	6,021	26,976	(7,900)	373,028
	1,478,164	69,060	161,573	(58,760)	1,650,037
Less discounts and allowances	(156,507)	(6,664)	(17,180)	—	(180,351)
PLEDGES RECEIVABLE, NET	**$ 1,321,657**	**$ 62,396**	**$ 144,393**	**$ (58,760)**	**$ 1,469,686**
2018					
One year or less	$ 217,754	$ 34,906	$ 42,720	$ (2,922)	$ 292,458
Between one year and five years	968,495	52,023	81,894	(22,671)	1,079,741
More than five years	295,908	7,000	39,460	(8,000)	334,368
	1,482,157	93,929	164,074	(33,593)	1,706,567
Less discounts and allowances	(160,989)	(9,394)	(17,698)	—	(188,081)
PLEDGES RECEIVABLE, NET	**$ 1,321,168**	**$ 84,535**	**$ 146,376**	**$ (33,593)**	**$ 1,518,486**

5. Loans Receivable

Loans receivable consist primarily of University student loans receivable and faculty and staff mortgages. University management regularly assesses the adequacy of the allowance for credit losses of its loans by performing ongoing evaluations considering the differing economic risks associated with each loan category, the financial condition of specific borrowers, the economic environment in which the borrowers operate, the level of delinquent loans and the value of any collateral.

STUDENT LOANS RECEIVABLE

Student loans receivable consist of institutional and federally-sponsored loans due from both current and former students. Student loans and allowance for student loan losses at August 31, 2019 and 2018, in thousands of dollars, are as follows:

	2019	2018
Institutional loans	$ 29,074	$ 26,714
Federally-sponsored loans	23,717	34,261
	52,791	60,975
Less allowance for student loan losses	(793)	(639)
STUDENT LOANS RECEIVABLE, NET	**$ 51,998**	**$ 60,336**

Institutional loans are funded by donor funds restricted for student loan purposes and University funds made available to meet demand for student loan borrowing in specific situations.

Federally-sponsored loans are funded by advances to the University primarily under the Federal Perkins Loan Program (the "Program"). During the year ended August 31, 2018, the University returned $14.3 million of Program funds to the U.S. Department of Education. Loans to students under the Program are subject to mandatory interest rates and significant restrictions and can be assigned to the federal government in certain non-repayment situations. In these situations, the federal portion of the loan balance is guaranteed.

Amounts received under the Program are ultimately refundable to the federal government in the event the University no longer participates in the Program, and accordingly, have been reported as an obligation in the *Consolidated Statements of Financial Position* as "U.S. government refundable loan funds." The Program expired in September 2017 and the University is no longer issuing new loans under the Program. The U.S. Department of Education is in the process of evaluating procedures to reimburse schools for the federal guaranteed portion of loans in certain non-repayment situations.

FACULTY AND STAFF MORTGAGES

In a program to attract and retain excellent faculty and senior staff, the University provides home mortgage financing assistance, primarily in the form of subordinated loans. The loans and mortgages are collateralized by deeds of trust on properties concentrated in the region surrounding the University. Notes receivable amounting to $780.2 million and $695.7 million at August 31, 2019 and 2018, respectively, from University faculty and staff are included in "faculty and staff mortgages and other loans receivable, net" in the *Consolidated Statements of Financial Position*. Management has determined that no allowance is necessary.

The August 31, 2019 and 2018 amounts are net of $167.4 million and $117.9 million, respectively, offset against the University's recorded obligation to repurchase certain residential units sold under long-term restricted ground leases. See the *Repurchase Obligations* section of *Note 1*.

6. Investments

Investments are measured and recorded at fair value. The valuation methodology, investment categories, fair value hierarchy, certain investment activities and related commitments for fiscal years 2019 and 2018 are presented below. Investments held by Stanford at August 31, 2019 and 2018, in thousands of dollars, are as follows:

	UNIVERSITY	SHC	LPCH	ELIMINATIONS	CONSOLIDATED
2019					
Investment assets:					
Cash and short-term investments	$ 488,132	$ 468,142	$ 3,477	$ —	$ 959,751
Collateral held for securities loaned	19,922	—	—	—	19,922
Public equities	8,163,632	377,663	51,547	—	8,592,842
Derivatives	17,384	—	—	—	17,384
Fixed income	2,049,289	211,169	98,820	—	2,359,278
Real estate	8,513,314	—	8,911	—	8,522,225
Natural resources	1,789,137	—	8,951	—	1,798,088
Private equities	9,941,833	—	25,144	—	9,966,977
Absolute return	5,565,483	—	19,471	—	5,584,954
Assets held by other trustees	124,736	—	15,275	—	140,011
Other	851,255	6,517	—	—	857,772
Total	37,524,117	1,063,491	231,596	—	38,819,204
Hospitals' funds invested in the University's investment pools	(2,232,489)	1,472,256	752,917	7,316	—
INVESTMENTS AT FAIR VALUE	**$35,291,628**	**$ 2,535,747**	**$ 984,513**	**$ 7,316**	**$ 38,819,204**
Investment liabilities:					
Income beneficiary share of split interest agreements[1]	$ 560,283	$ —	$ —	$ —	$ 560,283
Net investment income excise tax	42,892	—	—	—	42,892
Securities lending	19,922	—	—	—	19,922
Securities sold, not yet purchased	77,185	—	—	—	77,185
Accrued management fees	39,652	—	—	—	39,652
Pending trades of securities	18,227	—	—	—	18,227
LIABILITIES ASSOCIATED WITH INVESTMENTS	**$ 758,161**	**$ —**	**$ —**	**$ —**	**$ 758,161**

[1] *See split-interest agreements section in Note 1*

	UNIVERSITY	SHC	LPCH	ELIMINATIONS	CONSOLIDATED
2018					
Investment assets:					
Cash and short-term investments	$ 1,040,835	$ 447,307	$ 3,400	$ —	$ 1,491,542
Collateral held for securities loaned	77,137	—	—	—	77,137
Public equities	8,335,690	248,631	52,324	—	8,636,645
Derivatives	(554)	—	—	—	(554)
Fixed income	2,419,741	169,983	96,661	—	2,686,385
Real estate	7,367,786	41,688	8,215	—	7,417,689
Natural resources	2,525,967	—	10,944	—	2,536,911
Private equities	8,430,025	—	22,247	—	8,452,272
Absolute return	5,673,513	—	23,378	—	5,696,891
Assets held by other trustees	123,993	—	15,477	—	139,470
Other	648,308	896	—	—	649,204
Total	36,642,441	908,505	232,646	—	37,783,592
Hospitals' funds invested in the University's investment pools	(2,125,005)	1,393,429	724,423	7,153	—
INVESTMENTS AT FAIR VALUE	**$34,517,436**	**$ 2,301,934**	**$ 957,069**	**$ 7,153**	**$ 37,783,592**
Investment liabilities:					
Income beneficiary share of split interest agreements[1]	$ 541,558	$ —	$ —	$ —	$ 541,558
Securities lending	77,137	—	—	—	77,137
Securities sold, not yet purchased	69,092	—	—	—	69,092
Accrued management fees	6,693	—	—	—	6,693
Pending trades of securities	2,912	—	—	—	2,912
Other	11,237	—	—	—	11,237
LIABILITIES ASSOCIATED WITH INVESTMENTS	**$ 708,629**	**$ —**	**$ —**	**$ —**	**$ 708,629**

[1] *See split-interest agreements section in Note 1*

VALUATION METHODOLOGY

To the extent available, Stanford's investments are recorded at fair value based on quoted prices in active markets on a trade-date basis. Stanford's investments that are listed on any U.S. or non-U.S. recognized exchanges are valued based on readily available market quotations. When such inputs do not exist, fair value measurements are based on the best available information and usually require a degree of judgment. For alternative investments, which are principally interests in limited partnerships or similar investments in private equity, real estate, natural resources, public equities and absolute return funds, the value is primarily based on the Net Asset Value (NAV) of the underlying investments. The NAV is reported by external investment managers in accordance with their policies as described in their respective financial statements and offering memoranda. The most recent NAV reported is adjusted for any investment-related transactions such as capital calls or distributions and significant known valuation changes of its related portfolio through August 31, 2019 and 2018, respectively. These investments are generally less liquid than other investments, and the value reported may differ from the values that would have been reported had a ready market for these investments existed.

The University exercises due diligence in assessing the policies, procedures, and controls implemented by its external investment managers and believes its proportionate share of the carrying amount of these alternative investments is a reasonable estimate of fair value. Such due diligence procedures include, but are not limited to, ongoing communication, on-site visits, and review of information from external investment managers as well as review of performance. In conjunction with these procedures, estimated fair value is

determined by consideration of a range of factors, such as market conditions, redemption terms and restrictions, and risks inherent in the inputs of the external investment managers' valuations.

For certain alternative investments which are direct investments, Stanford considers various factors to estimate fair value, such as, but not limited to, the timing of the transaction, the market in which the company operates, comparable transactions, company performance and projections, as well as discounted cash flow analysis. The selection of an appropriate valuation technique may be affected by the availability and general reliability of relevant inputs. In some cases, one valuation technique may provide the best indication of fair value while in other circumstances, multiple valuation techniques may be appropriate. Furthermore, Stanford may review the investment's underlying portfolio as well as engage external appraisers, depending on the circumstances and the nature of the investment.

The investment portfolio may be exposed to various risks, including, but not limited to, interest rate, market, sovereign, geographic, counterparty, liquidity and credit risk. Stanford management regularly assesses these risks through established policies and procedures. Fair value reporting requires management to make estimates and assumptions about the effects of matters that are inherently uncertain. Actual results could differ from these estimates and such differences could have a material impact on the *Consolidated Financial Statements*.

INVESTMENT CATEGORIES

Investments are categorized by asset class and valued as described below:

Cash and short-term investments include cash, cash equivalents, mutual funds, and fixed income investments with maturities of less than one year (see also *Note 1*). Cash equivalents such as money market funds and overnight repurchase agreements are carried at cost. Fixed income investments such as short-term U.S. Treasury bills are carried at amortized cost. Due to the short-term nature and liquidity of these financial instruments, the carrying values of these assets approximates fair value. Cash may include collateral provided to or received from counterparties associated with investment-related derivative contracts (see *Note 8*).

Collateral held for securities loaned is generally received in the form of cash and cash equivalents and is reinvested for income in cash equivalent vehicles. These investments are recorded at fair value.

Public equities are investments valued based on quoted market prices (and exchange rates, if applicable) on the last trading date of the principal market on or before August 31. They include investments that are directly held as well as commingled funds which invest in publicly traded equities. The fair values of public equities held through alternative investments are calculated by the respective external investment managers as described under *Valuation Methodology* above.

Derivatives are used by Stanford to manage its exposure to certain risks relating to ongoing business and investment operations. Derivatives include forward currency contracts which are valued using industry standard models with the applicable forward exchange rates.

Fixed income investments are valued by independent pricing sources, broker dealers or pricing models that factor in, where applicable, recently executed transactions, interest rates, bond or credit default spreads and volatility. They primarily include investments that are actively traded fixed income securities or mutual funds.

Real estate represents directly owned real estate, mutual funds, interests in long-term ground leases and other real estate interests held through limited partnerships. A significant portion of the fair value of real estate directly owned by Stanford and subject to long-term ground leases, including the Stanford Shopping Center and the Stanford Research Park, is based on independent appraisals that use discounted cash flows and market data, if available. The fair value of alternative investments in real estate held through limited

partnerships is based on the NAV reported by the external investment managers and is adjusted as described under *Valuation Methodology* above. The fair value of real estate held through commingled and mutual funds are based on quoted market prices.

Natural resources represent commodity and energy related investments held through both public and non-public investments. Public securities are valued based on quoted market prices (and exchange rates, if applicable) on the last trading day of the principal market on or before August 31. The fair value of direct non-public investments are based on a combination of models, including appraisals, discounted cash flows and commodity price factors. The fair value of natural resources held as alternative investments is based on the NAV reported by the external investment managers and is adjusted as described under *Valuation Methodology* above.

Private equities are investments primarily in venture capital and leveraged buyout strategies. Distributions from these investments are received in the form of either cash or distributed shares, which are typically valued using quoted market prices. The fair value of alternative investments is based on the NAV reported by the external investment managers and is adjusted as described under *Valuation Methodology* above.

Absolute return investments are typically commingled funds that employ multiple strategies to produce positive returns which may be uncorrelated to financial market activities. The fair value of these types of alternative investments is valued based on the NAV reported by the external investment managers and is adjusted as described under *Valuation Methodology* above.

Assets held by other trustees generally represent Stanford's residual (or beneficial) interest in split-interest agreements where the University, SHC or LPCH is not the trustee. The residual interest represents the present value of the future distributions expected to be received over the term of the agreement, which approximates fair value, and the assets are based on estimates provided by trustees.

Other investments are typically non-public investments such as preferred stocks, convertible notes and mineral rights. The fair value of these types of direct investments is determined as described under *Valuation Methodology* above.

FAIR VALUE HIERARCHY

U.S. GAAP defines fair value as the price received upon sale of an asset or paid upon transfer of a liability in an orderly transaction between market participants. Current guidance establishes a hierarchy of valuation inputs based on the extent to which the inputs are observable in the marketplace. Inputs are used in applying the various valuation techniques and take into account the assumptions that market participants use to make valuation decisions. Inputs may include price information, credit data, liquidity statistics, and other factors specific to the financial instrument. Observable inputs reflect market data obtained from independent sources. In contrast, unobservable inputs reflect the entity's assumptions about how market participants would value the financial instrument. Valuation techniques used under U.S. GAAP must maximize the use of observable inputs to the extent available.

A financial instrument's level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement. The following describes the hierarchy of inputs used to measure fair value and the primary valuation methodologies used for financial instruments measured at fair value on a recurring basis:

Level 1 - Investments whose values are based on quoted market prices in active markets for identical assets or liabilities are classified as Level 1. Level 1 investments include active listed equities and certain short term fixed income securities. Such investments are valued based upon the closing price quoted on the last trading date on or before the reporting date on the principal market, without adjustment.

Level 2 - Investments that trade in markets that are not actively traded, but are valued based on quoted market prices, dealer quotations, or alternative pricing sources for similar assets or liabilities are classified as Level 2. These investments include certain U.S. government and sovereign obligations, government agency obligations, investment grade corporate bonds and certain limited marketable securities.

Privately negotiated over-the-counter (OTC) derivatives such as forward currency contracts, total return swaps, and interest rate swaps are typically classified as Level 2 (see *Note 8*). In instances where quotations received from counterparties or valuation models are used, the value of an OTC derivative depends upon the contractual terms of the instrument as well as the availability and reliability of observable inputs. Such inputs include market prices for reference securities, yield curves, or credit curves.

Level 3 - Investments classified as Level 3 have significant unobservable inputs, as they trade infrequently or not at all. The inputs into the determination of fair value of these investments are based upon the best information available and may require significant management judgment. These investments primarily consist of Stanford's direct real estate and alternative investments.

The following tables summarize Stanford's investment assets and liabilities within the fair value hierarchy and asset categories at August 31, 2019 and 2018, in thousands of dollars:

	LEVEL 1	LEVEL 2	LEVEL 3	TOTAL
2019				
Investment assets:				
Cash and short-term investments	$ 591,881	$ 361,572	$ —	$ 953,453
Collateral held for securities loaned	—	19,922	—	19,922
Public equities	3,276,709	157	—	3,276,866
Derivatives	—	17,384	—	17,384
Fixed income	495,955	1,863,324	—	2,359,279
Real estate	62,328	—	6,748,672	6,811,000
Natural resources	141,875	—	141,240	283,115
Private equities	1,322	—	1,263	2,585
Absolute return	1,138	—	25,911	27,049
Assets held by other trustees	—	—	140,011	140,011
Other	110,635	57	733,032	843,724
INVESTMENTS SUBJECT TO FAIR VALUE LEVELING	**$ 4,681,843**	**$ 2,262,416**	**$ 7,790,129**	**14,734,388**
Investments measured using Net Asset Value[1]				24,084,816
TOTAL CONSOLIDATED INVESTMENT ASSETS				**$ 38,819,204**
Investment liabilities:				
Income beneficiary share of split interest agreements	$ —	$ 560,283	$ —	$ 560,283
Net investment income excise tax	42,892	—	—	42,892
Securities lending	—	19,922	—	19,922
Securities sold, not yet purchased	77,185	—	—	77,185
Accrued management fees	39,652	—	—	39,652
Pending trades of securities	18,227	—	—	18,227
LIABILITIES ASSOCIATED WITH INVESTMENTS	**$ 177,956**	**$ 580,205**	**$ —**	**$ 758,161**

[1] *Entities may estimate the fair value of certain investments by using NAV as a practical expedient as of the measurement date. Investments measured under this method are not categorized in the fair value hierarchy. The fair value amounts of such investments are presented for reconciliation purposes.*

	LEVEL 1	LEVEL 2	LEVEL 3	TOTAL
2018				
Investment assets:				
Cash and short-term investments	$ 569,707	$ 914,425	$ —	$ 1,484,132
Collateral held for securities loaned	—	77,137	—	77,137
Public equities	2,996,887	1,417	—	2,998,304
Derivatives	—	(554)	—	(554)
Fixed income	470,099	2,216,286	—	2,686,385
Real estate	98,087	—	5,792,978	5,891,065
Natural resources	520,183	—	210,270	730,453
Private equities	505	—	20,188	20,693
Absolute return	1,278	—	27,378	28,656
Assets held by other trustees	—	—	139,470	139,470
Other	9,921	—	627,989	637,910
INVESTMENTS SUBJECT TO FAIR VALUE LEVELING	**$ 4,666,667**	**$ 3,208,711**	**$ 6,818,273**	**14,693,651**
Investments measured using Net Asset Value[1]				23,089,941
TOTAL CONSOLIDATED INVESTMENT ASSETS				**$ 37,783,592**
Investment liabilities:				
Income beneficiary share of split interest agreements	$ —	$ 541,558	$ —	$ 541,558
Securities lending	—	77,137	—	77,137
Securities sold, not yet purchased	69,092	—	—	69,092
Accrued management fees	6,693	—	—	6,693
Pending trades of securities	2,912	—	—	2,912
Other	—	—	11,237	11,237
LIABILITIES ASSOCIATED WITH INVESTMENTS	**$ 78,697**	**$ 618,695**	**$ 11,237**	**$ 708,629**

[1] *Entities may estimate the fair value of certain investments by using NAV as a practical expedient as of the measurement date. Investments measured under this method are not categorized in the fair value hierarchy. The fair value amounts of such investments are presented for reconciliation purposes.*

SUMMARY OF LEVEL 3 INVESTMENT ACTIVITIES AND TRANSFERS

The following tables present the activities for Level 3 investments for the years ended August 31, 2019 and 2018, in thousands of dollars:

FAIR VALUE MEASUREMENTS USING SIGNIFICANT UNOBSERVABLE INPUTS (LEVEL 3)	BEGINNING BALANCE AS OF SEPTEMBER 1, 2018	PURCHASES AND ADDITIONS	SALES AND MATURITIES	NET REALIZED AND UNREALIZED GAINS (LOSSES)	TRANSFERS IN*	TRANSFERS OUT*	ENDING BALANCE AS OF AUGUST 31, 2019
Real estate	$ 5,792,978	$ 53,953	$ (15,197)	$ 916,938	$ —	$ —	$ 6,748,672
Natural resources	210,270	2,346	(16,111)	(55,265)	—	—	141,240
Private equities	20,188	—	(28,181)	9,256	—	—	1,263
Absolute return	27,378	—	—	(1,467)	—	—	25,911
Assets held by other trustees	139,470	1,389	(3,120)	2,272	—	—	140,011
Other	627,989	95,556	(61,113)	71,111	—	(511)	733,032
TOTAL	**$ 6,818,273**	**$ 153,244**	**$ (123,722)**	**$ 942,845**	**$ —**	**$ (511)**	**$ 7,790,129**

FAIR VALUE MEASUREMENTS USING SIGNIFICANT UNOBSERVABLE INPUTS (LEVEL 3)	BEGINNING BALANCE AS OF SEPTEMBER 1, 2017	PURCHASES AND ADDITIONS	SALES AND MATURITIES	NET REALIZED AND UNREALIZED GAINS (LOSSES)	TRANSFERS IN*	TRANSFERS OUT*	ENDING BALANCE AS OF AUGUST 31, 2018
Real estate	$ 5,417,959	$ 140,542	$ (111,150)	$ 345,627	$ —	$ —	$ 5,792,978
Natural resources	238,161	3,879	(13,705)	(2,837)	—	(15,228)	210,270
Private equities	52,259	—	(38,242)	6,171	—	—	20,188
Absolute return	28,653	—	—	(1,275)	—	—	27,378
Assets held by other trustees	154,852	4,111	(23,763)	4,895	—	(625)	139,470
Other	461,040	71,441	(30,221)	125,729	—	—	627,989
TOTAL	**$ 6,352,924**	**$ 219,973**	**$ (217,081)**	**$ 478,310**	**$ —**	**$ (15,853)**	**$ 6,818,273**

**Transfers in (out) are primarily due to reclassification of investments between asset classes and changes in the fair value hierarchy.*

Net realized and unrealized gains (losses) in the tables above are included in the *Consolidated Statements of Activities* primarily as increases or decreases in reinvested gains by level of restriction. For the years ended August 31, 2019 and 2018, the change in unrealized gains (losses) for Level 3 investments still held at August 31, 2019 and 2018 was $936.9 million and $491.7 million, respectively.

LEVEL 3 INVESTMENT VALUATION TECHNIQUES AND SIGNIFICANT UNOBSERVABLE INPUTS

The following table summarizes the significant unobservable inputs and valuation methodologies for Level 3 investments as of August 31, 2019 and 2018, in thousands of dollars.

For each investment category and respective valuation technique, the range of the significant unobservable input is dependent on the nature and characteristics of the investment and may vary at each balance sheet date.

INVESTMENT CATEGORIES	FAIR VALUE[1]	VALUATION TECHNIQUE	SIGNIFICANT UNOBSERVABLE INPUTS	RANGE MIN	RANGE MAX	IMPACT TO VALUATION FROM AN INCREASE IN INPUT[2]
2019						
Real estate	$ 6,045,530	Discounted cash flow	Discount rate	5.0%	20.0%	Decrease
			Capitalization rate	3.9%	9.0%	Decrease
Assets held by other trustees	124,736	Net present value	Discount rate	2.2%	2.2%	Decrease
Other	687,854	Market comparables	Recent transactions	N/A	N/A	N/A
TOTAL AMOUNT WITH SIGNIFICANT UNOBSERVABLE	**$ 6,858,120**					
2018						
Real estate	$ 5,155,212	Discounted cash flow	Discount rate	5.0%	20.0%	Decrease
			Capitalization rate	3.9%	9.0%	Decrease
Assets held by other trustees	123,993	Net present value	Discount rate	3.4%	3.4%	Decrease
Other	604,585	Market comparables	Recent transactions	N/A	N/A	N/A
TOTAL AMOUNT WITH SIGNIFICANT UNOBSERVABLE	**$ 5,883,790**					

[1] $932.0 million and $934.5 million of Level 3 investments at August 31, 2019 and 2018, respectively, are valued using third-party valuations, other market comparables or recent transactions as an approximation of fair value.

[2] Unless otherwise noted, this column represents the directional change in the fair value of the Level 3 investments that would have resulted from an increase to the corresponding unobservable input. A decrease to the unobservable input would have the opposite effect. Significant increases and decreases in these unobservable inputs in isolation would result in significantly higher or lower fair value measurements.

INVESTMENT-RELATED COMMITMENTS

The University is obligated under certain alternative investment agreements to advance additional funding up to specified levels over a period of several years. The following table presents significant terms of such agreements including redemption terms, notice periods, and remaining life for all related alternative investments at August 31, 2019, in thousands of dollars:

ASSET CLASS	FAIR VALUE	UNFUNDED COMMITMENT	REMAINING LIFE (YEARS)	REDEMPTION TERMS
Public equities	$ 5,271,989	$ 219,848	0 to 5	Generally, lock-up provisions ranging from 0 to 2 years. After initial lock up expires, redemptions are available on a rolling basis and require 30 to 90 days prior notification.
Real estate	1,749,967	1,507,547	0 to 13	Not eligible for redemption
Natural resources	1,622,674	556,345	0 to 15	Not eligible for redemption
Private equities	9,940,458	3,849,854	0 to 16	Not eligible for redemption
Absolute return	5,565,483	932,158	0 to 7	Generally, lock-up provisions ranging from 0 to 5 years. After initial lock up expires, redemptions are available on a rolling basis and require 30 to 90 days prior notification.
TOTAL	**$24,150,571**	**$ 7,065,752**		

LIABILITIES ASSOCIATED WITH INVESTMENTS

Income beneficiary share of split interest agreements - See the *Split–Interest Agreements* section of *Note 1*.

Net investment income excise tax represents current and deferred tax liabilities (see *Note 1*).

Securities lending - The University has a collateralized borrowing program in which it receives short-term U.S. government obligations or cash and cash equivalents in exchange for transferring securities as collateral to the counterparty and recognizes an obligation to reacquire the securities for cash at the transaction's maturity. It is the University's policy to require receipt of collateral equal to a minimum of 102% of the fair market value of these collateralized borrowings. In the event the counterparty was to default on its obligations, The University has the right to repurchase the securities in the open market using the collateral received.

Under the securities lending agreement, securities loaned are primarily public equities, corporate bonds or U.S. Treasury bills and the agreement continues until the security is delivered back to the University. The estimated fair value of securities loaned at August 31, 2019 and 2018 was $19.3 million and $75.5 million, respectively. At August 31, 2019, the University received on loan publicly traded equities of $19.9 million. At August 31, 2018, the University received cash and short-term investments in the amount of $77.1 million; $30.4 million was received for loaned publicly traded equities and $46.7 million was received for loaned U.S. Treasury notes.

Securities sold, not yet purchased are obligations to acquire and deliver to the lenders the publicly traded securities identical to the ones borrowed. A realized gain or loss is recognized for the difference between the proceeds and the cost of such securities at that time.

Accrued management fees are obligations related to management and performance fees due quarterly or annually to external investment managers in accordance with agreed-upon terms.

Pending trades of securities are obligations arising from trades of securities purchased but not settled. These are usually settled three business days after the trade date.

OFFSETS TO INVESTMENT-RELATED ASSETS AND LIABILITIES

Financial instruments with off-balance sheet risk such as derivatives, securities lending agreements, securities sold, not yet purchased and repurchase agreements are subject to counterparty credit risk. The University seeks to control this risk in various ways, such as entering into transactions with counterparties with high creditworthiness, establishing and monitoring credit limits, and requiring collateral in certain situations.

The University generally maintains master netting agreements and collateral agreements with its counterparties. These agreements provide the University the right to net a counterparty's rights and obligations under the agreement and to liquidate and offset collateral against any net amount owed by the counterparty, in the event of default by the counterparty, such as bankruptcy or a failure to pay or perform. For certain derivatives, a master netting arrangement allows the counterparty to net any of its applicable liabilities or payment obligations to the University against any collateral previously provided or received (see *Note 8*).

The University may enter into repurchase and reverse repurchase agreements to sell or purchase securities to or from the counterparty with an agreement to repurchase or sell the same securities from or to the counterparty at a predetermined price.

The following table presents information about the gross amounts of assets and liabilities, the offset of these instruments and the related collateral amounts as of August 31, 2019 and 2018, in thousands of dollars:

	GROSS AMOUNTS OF ASSETS AND LIABILITIES	OFFSET AMOUNTS	NET AMOUNTS	COLLATERAL RECEIVED (PLEDGED)[2]	NET EXPOSURE
2019					
Assets:					
Derivatives[1]	$ 18,059	$ (675)	$ 17,384	$ 17,384	$ —
Repurchase agreements[3]	242,618	—	242,618	242,618	—
TOTAL	**260,677**	**(675)**	**260,002**	**260,002**	**—**
Liabilities:					
Derivatives[1]	675	(675)	—	—	—
Securities sold, not yet purchased	77,185	—	77,185	(77,185)	—
Securities lending	19,922	—	19,922	(19,922)	—
TOTAL	**$ 97,782**	**$ (675)**	**$ 97,107**	**$ (97,107)**	**$ —**
2018					
Assets:					
Derivatives[1]	$ 3	$ (3)	$ —	$ —	$ —
Repurchase agreements[3]	176,539	—	176,539	176,539	—
TOTAL	**176,542**	**(3)**	**176,539**	**176,539**	**—**
Liabilities:					
Derivatives[1]	557	(3)	554	(554)	—
Securities sold, not yet purchased	69,092	—	69,092	(69,092)	
Securities lending	77,137	—	77,137	(77,137)	—
TOTAL	**$ 146,786**	**$ (3)**	**$ 146,783**	**$ (146,783)**	**$ —**

[1] *Gross derivative assets less gross derivative liabilities are presented as "derivatives" in the investment assets table.*

[2] *These collateral amounts received (pledged) are limited to the asset balance and accordingly, do not include any excess collateral received.*

[3] *Repurchase agreements are included in "Cash and short-term investments" in the investment assets table.*

INVESTMENT RETURNS

Total investment returns for the years ended August 31, 2019 and 2018, in thousands of dollars, are as follows:

	UNIVERSITY	SHC	LPCH	CONSOLIDATED
2019				
Investment income	$ 280,892	$ 53,440	$ 5,182	$ 339,514
Net realized and unrealized gains	2,446,169	102,680	62,486	2,611,335
TOTAL INVESTMENT RETURNS, NET	**$ 2,727,061**	**$ 156,120**	**$ 67,668**	**$ 2,950,849**
Reconciliation to *Statements of Activities:*				
Total investment income distributed for operations	$ 1,564,700	$ 2,337	$ 15,774	$ 1,582,811
Increase in reinvested gains:				
Without donor restrictions	1,040,312	150,792	31,169	1,222,273
With donor restrictions	90,562	2,991	20,700	114,253
Change in value of split-interest agreements, net	3,802	—	25	3,827
Adjustments for actuarial re-evaluations and maturities of split-interest agreements	27,685	—	—	27,685
TOTAL INVESTMENT RETURNS, NET	**$ 2,727,061**	**$ 156,120**	**$ 67,668**	**$ 2,950,849**
2018				
Investment income	$ 349,569	$ 40,091	$ 5,072	$ 394,732
Net realized and unrealized gains	2,689,706	122,912	87,336	2,899,954
TOTAL INVESTMENT RETURNS, NET	**$ 3,039,275**	**$ 163,003**	**$ 92,408**	**$ 3,294,686**
Reconciliation to *Statements of Activities:*				
Total investment income distributed for operations	$ 1,493,388	$ 1,232	$ 14,187	$ 1,508,807
Increase in reinvested gains:				
Without donor restrictions	951,197	158,592	49,765	1,159,554
With donor restrictions	521,545	3,179	28,244	552,968
Change in value of split-interest agreements, net	23,903	—	212	24,115
Adjustments for actuarial re-evaluations and maturities of split-interest agreements	49,242	—	—	49,242
TOTAL INVESTMENT RETURNS, NET	**$ 3,039,275**	**$ 163,003**	**$ 92,408**	**$ 3,294,686**

Investment returns are net of investment management expenses, including both external management fees and internal University investment-related salaries, benefits and operating expenses, and the portion of interest expense and amortization related to the April 2009 bond issuance held for liquidity purposes (see *Note 10*).

FUTURE MINIMUM RENTAL INCOME

As part of its investment portfolio, Stanford holds certain investment properties that it leases to third parties. Future minimum rental income due from the Stanford Shopping Center, the Stanford Research Park and other properties under non-cancellable leases in effect with tenants at August 31, 2019, in thousands of dollars, is as follows:

	FUTURE MINIMUM RENTAL INCOME			
YEAR ENDING AUGUST 31	UNIVERSITY	SHC	LPCH	CONSOLIDATED
2020	$ 140,832	$ 5,591	$ 1,278	$ 147,701
2021	148,762	5,513	1,258	155,533
2022	138,961	4,934	1,215	145,110
2023	119,384	2,449	576	122,409
2024	104,512	1,705	268	106,485
Thereafter	2,235,423	9,594	—	2,245,017
TOTAL	**$ 2,887,874**	**$ 29,786**	**$ 4,595**	**$ 2,922,255**

7. Investment Pools

Investments are held in various investment pools or in specific investments to comply with donor requirements as indicated in the following table, at August 31, 2019 and 2018, in thousands of dollars:

	2019	2018
Merged Pool (MP)	$ 29,561,908	$ 28,882,135
Short-Term Investment Pool (STIP)	918,029	1,086,578
Expendable Funds Pool (EFP)	4,204,205	4,011,294
Endowment Income Funds Pool (EIFP)	386,019	368,194
Intermediate Pool (IPool)	364,862	485,382
Other investment pools	140,965	123,845
Specific investments	7,401,368	6,787,501
	42,977,356	41,744,929
Adjustments:		
Amounts included in "cash and cash equivalents" in the *Consolidated Statements of Financial Position*	(654,307)	(212,648)
Funds cross-invested in investment pools	(4,798,932)	(4,889,840)
Hospitals' funds not invested in the University's investment pools	1,295,087	1,141,151
TOTAL INVESTMENTS	**$ 38,819,204**	**$ 37,783,592**

The MP is the primary investment pool in which endowment (see *Note 12*) and other long-term funds are invested. The MP is invested with the objective of optimizing long-term total return while maintaining an appropriate level of risk for the University. It is a unitized investment pool in which the fundholders purchase investments and withdraw funds based on a monthly share value.

The University manages the majority of SHC's and LPCH's investments, including their investments in the Merged Pool (MP). SHC's investments in the MP were $1.5 billion and $1.4 billion at August 31, 2019 and 2018, respectively. LPCH's investments in the MP were $752.9 million and $724.4 million at August 31, 2019 and 2018, respectively.

The majority of Stanford's cash and other highly liquid investments are accumulated and managed in a short-term investment pool (STIP). The primary objective of the STIP is to preserve the principal value of the portfolio, while meeting the liquidity needs of the University.

The Expendable Funds Pool (EFP) and Endowment Income Funds Pool (EIFP) are the principal investment vehicles for the University's expendable funds. A substantial portion of the EFP is cross-invested in the MP. For the years ended August 31, 2019 and 2018, the EFP was also invested in the STIP and the Intermediate Pool (IPool). The EIFP holds income previously distributed to holders of endowment funds with restrictions that are perpetual in nature that has not yet been expended and the entire balance is invested in the STIP.

The IPool was established to invest funds with the objective of achieving greater liquidity than the MP and higher returns than the STIP. Similar to the MP, the IPool is a unitized investment pool with a monthly share value.

The Board has established a policy for the distribution of the investment returns of the EFP. The difference between the actual return of this investment pool and the approved payout is deposited in, or withdrawn from, funds functioning as endowment (FFE) (see *Note 12*). For the years ended August 31, 2019 and 2018, the results of the EFP, in thousands of dollars, are as follows:

	2019	2018
Total investment return of the EFP	$ 225,664	$ 336,767
Less distributions to fund holders and operations	(202,042)	(181,411)
AMOUNTS ADDED TO FFE	**$ 23,622**	**$ 155,356**

8. Derivatives

Stanford, directly or through external investment managers on Stanford's behalf, utilizes various strategies to reduce investment and credit risks, to serve as a temporary surrogate for investment in stocks and bonds, to manage interest rate exposure on debt, and/or to manage specific exposure to foreign currencies. Futures, options and other derivative instruments are used to adjust elements of investment exposures to various securities, sectors, markets and currencies without actually taking a position in the underlying asset or basket of assets. Interest rate swaps are used to manage interest rate risk. With respect to foreign currencies, Stanford utilizes forward contracts and foreign currency options to manage exchange rate risk.

INVESTMENT-RELATED DERIVATIVES

The following table presents amounts for investment-related derivatives, including the notional amount, the fair values at August 31, 2019 and 2018, and gains and losses for the years ended August 31, 2019 and 2018, in thousands of dollars:

	NOTIONAL AMOUNT[1]	GROSS DERIVATIVE ASSETS[2]	GROSS DERIVATIVE LIABILITIES[2]	REALIZED AND UNREALIZED LOSSES[3]
				YEAR ENDED
2019	AS OF AUGUST 31			AUGUST 31
Foreign exchange contracts	$ 26,504	$ —	$ 675	$ (1,473)
Equity contracts[4]	439,942	18,059	—	(67,006)
TOTAL	**$ 466,446**	**$ 18,059**	**$ 675**	**$ (68,479)**
2018				
Foreign exchange contracts	$ 8,700	$ 3	$ 557	$ (4,017)
Equity contracts	—	—	—	(2,248)
TOTAL	**$ 8,700**	**$ 3**	**$ 557**	**$ (6,265)**

[1] The notional amount is representative of the volume and activity of the respective derivative type during the years ended August 31, 2019 and 2018.

[2] Gross derivative assets less gross derivative liabilities of $17.4 million and ($554) thousand as of August 31, 2019 and 2018, respectively, are presented as "derivatives" on the investment table in Note 6.

[3] Losses on derivatives are included in the Statements of Activities line "increase in reinvested gains" in "non-operating activities."

[4] Included in equity contracts are fair value hedging derivatives with a fair value of $11.8 million as of August 31, 2019. The realized and unrealized losses related to these equity contracts were $71.3 million for the year ended August 31, 2019.

DEBT-RELATED DERIVATIVES

The University and SHC use interest rate exchange agreements to manage the interest rate exposure of their debt portfolios. Under the terms of the current agreements, the entities pay a fixed interest rate, determined at inception, and receive a variable rate on the underlying notional principal amount. Generally, the exchange agreements require mutual posting of collateral by the University and SHC and the counterparties if the termination values exceed a predetermined threshold dollar amount.

At August 31, 2019, the University had interest rate exchange agreements related to $97.0 million of the outstanding balance of the CEFA Series S bonds in variable rate mode (see *Note 10*). The agreements, which have a weighted average interest rate of 3.68%, expire November 1, 2039. The notional amount and the fair value of the exchange agreements are included in the table below. Collateral posted with various counterparties was $28.6 million and $13.5 million at August 31, 2019 and 2018, respectively, and is included in the *Consolidated Statements of Financial Position*. In addition, the University issued an irrevocable standby letter of credit of $15.0 million to support collateral requirements at August 31, 2019 and 2018 (see *Note 10*).

At August 31, 2019, SHC had interest rate exchange agreements expiring through November 2051 (see *Note 10*). The agreements require SHC to pay fixed interest rates to the counterparties varying from 3.37% to 4.08% in exchange for variable rate payments from the counterparties based on a percentage of the One Month London Interbank Offered Rate (LIBOR). The notional amount and the fair value of the exchange agreements are included in the table below. There was cash collateral required to be posted with counterparties at August 31, 2019 of $31.6 million and no cash collateral posted at August 31, 2018.

The following table presents amounts for debt-related derivatives including the notional amount, the fair values at August 31, 2019 and 2018, and gains and losses for the years ended August 31, 2019 and 2018, in thousands of dollars:

	AS OF AUGUST 31, 2019		YEAR ENDED AUGUST 31, 2019	AS OF AUGUST 31, 2018		YEAR ENDED AUGUST 31, 2018
	NOTIONAL AMOUNT[1]	GROSS DERIVATIVE LIABILITIES[2]	UNREALIZED LOSSES[3]	NOTIONAL AMOUNT[1]	GROSS DERIVATIVE LIABILITIES[2]	UNREALIZED GAINS[3]
Debt-related interest-rate contracts:						
University	$ 97,000	$ 48,294	$ (20,580)	$ 97,000	$ 27,714	$ 10,653
SHC	574,925	316,796	(134,269)	575,400	182,527	63,439
TOTAL	**$ 671,925**	**$ 365,090**	**$ (154,849)**	**$ 672,400**	**$ 210,241**	**$ 74,092**

[1] The notional amount is representative of the volume and activity of the respective derivative type during the years ended August 31, 2019 and 2018.

[2] Fair value is measured using Level 2 inputs as defined in Note 6. Amounts are included in the Statements of Financial Position in "accounts payable and accrued expenses" and discussed more fully in Note 10.

[3] Gains (losses) on derivatives are included in the Statements of Activities as "swap interest and change in value of swap agreements" in "non-operating activities".

9. Plant Facilities

Plant facilities, net of accumulated depreciation, at August 31, 2019 and 2018, in thousands of dollars, are as follows:

	UNIVERSITY	SHC	LPCH	CONSOLIDATED
2019				
Land and improvements	$ 606,454	$ 68,844	$ 120,833	$ 796,131
Buildings and building improvements	7,427,617	1,773,365	1,792,861	10,993,843
Furniture, fixtures and equipment	1,986,883	1,246,431	494,123	3,727,437
Utilities	888,798	—	—	888,798
Construction in progress	1,567,663	2,426,480	152,991	4,147,134
	12,477,415	5,515,120	2,560,808	20,553,343
Less accumulated depreciation	(5,207,133)	(1,824,105)	(658,618)	(7,689,856)
PLANT FACILITIES, NET OF ACCUMULATED DEPRECIATION	**$ 7,270,282**	**$ 3,691,015**	**$ 1,902,190**	**$ 12,863,487**
2018				
Land and improvements	$ 595,470	$ 68,844	$ 120,519	$ 784,833
Buildings and building improvements	6,624,088	1,694,056	1,736,783	10,054,927
Furniture, fixtures and equipment	1,872,370	1,185,244	476,025	3,533,639
Utilities	862,810	—	—	862,810
Construction in progress	1,387,188	1,969,625	108,531	3,465,344
	11,341,926	4,917,769	2,441,858	18,701,553
Less accumulated depreciation	(4,834,389)	(1,638,721)	(550,157)	(7,023,267)
PLANT FACILITIES, NET OF ACCUMULATED DEPRECIATION	**$ 6,507,537**	**$ 3,279,048**	**$ 1,891,701**	**$ 11,678,286**

At August 31, 2019, $2.1 billion, $1.1 billion, and $161.8 million of fully depreciated plant facilities were still in use by the University, SHC, and LPCH, respectively, and are included in plant facilities and accumulated depreciation in the above table.

10. Notes and Bonds Payable

Notes and bonds payable for the University, SHC, and LPCH at August 31, 2019 and 2018, in thousands of dollars, are presented in the table below. The University is not an obligor or guarantor with respect to any obligations of SHC or LPCH, nor are SHC or LPCH obligors or guarantors with respect to obligations of the University or each other.

	YEAR OF MATURITY	EFFECTIVE INTEREST RATE * 2019/2018	OUTSTANDING PRINCIPAL 2019	2018
UNIVERSITY:				
Tax-exempt:				
CEFA Fixed Rate Revenue Bonds:				
Series S	2040	3.18%	$ 30,210	$ 30,210
Series T	2023-2039	3.66%-4.30%	188,900	188,900
Series U	2021-2046	1.75%-4.25%	1,167,205	1,167,205
Series V	2029-2049	1.83%-3.12%	441,830	—
CEFA Variable Rate Revenue Bonds and Notes:				
Series L	2023	1.17%/1.31%	36,208	36,208
Series S	2040-2051	1.32-1.65%/1.53%-1.78%	141,200	141,200
Commercial Paper	2019	0.00%/1.60%-1.63%	—	130,000
Taxable:				
Fixed Rate Notes and Bonds:				
Stanford University Bonds	2024	6.88%	150,000	150,000
Medium Term Note	2026	7.65%	50,000	50,000
Stanford University Series 2009A	2019	4.75%	—	137,815
Stanford University Series 2012	2042	4.01%	143,235	143,235
Stanford University Series 2013	2044	3.56%	150,115	150,115
Stanford University Series 2014	2054	4.25%	150,000	150,000
Stanford University Series 2015	2047	3.46%	250,000	250,000
Stanford University Series 2017	2048	3.65%	750,000	750,000
Stanford University Series 2019	2029	3.09%	121,000	—
Other	2020-2031	Various	3,481	3,481
Revolving Credit Facilities	2021	2.44%/2.22%-2.27%	55,570	75,850
University notes and bonds payable			3,828,954	3,554,219
Unamortized issuance costs, premiums, and discounts, net			418,381	280,078
UNIVERSITY TOTAL			**$ 4,247,335**	**$ 3,834,297**
SHC:				
CHFFA Fixed Rate Revenue Bonds:				
2008 Series A-1	2020-2021	3.83%/3.79%	$ 900	$ 1,375
2008 Series A-2	2020-2022	3.70%/3.65%	1,775	2,475
2008 Series A-3	2020-2022	3.69%/3.65%	1,450	2,000
2010 Series A	2020-2021	3.82%/3.76%	13,195	19,325
2012 Series A	2028-2051	3.98%	340,000	340,000
2012 Series B	2020-2023	2.42%/2.36%	28,770	35,420
2015 Series A	2052-2054	4.10%	100,000	100,000
2017 Series A	2022-2041	2.82%/2.81%	454,200	454,200
2018 Series Taxable Bonds	2049	3.80%	500,000	500,000
CHFFA Variable Rate Revenue Bonds:				
2008 Series B	2042-2046	1.16%/1.38%	168,200	168,200
2012 Series C	2039-2051	1.60%/1.81%	60,000	60,000
2012 Series D	2020	1.89%/1.79%	100,000	100,000
2015 Series B	2024	2.04%/1.94%	75,000	75,000
SHC notes and bonds payable			1,843,490	1,857,995
Unamortized issuance costs, premiums, and discounts, net			91,924	96,677
SHC TOTAL			**$ 1,935,414**	**$ 1,954,672**
LPCH:				
CHFFA Fixed Rate Revenue Bonds:				
2012 Series A	2044-2051	4.32%	$ 200,000	$ 200,000
2012 Series B	2020-2027	2.85%/2.79%	34,615	37,205
2014 Series A	2025-2043	3.84%	100,000	100,000
2016 Series A	2020-2033	2.30%/2.23%	63,915	67,170
2016 Series B	2052-2055	3.34%	100,000	100,000
2017 Series A	2020-2056	3.04%/3.01%	197,925	200,000
CHFFA Variable Rate Revenue Bonds:				
2014 Series B	2034-2043	1.89%/1.79%	100,000	100,000
Revolving Credit Facilities	2023	2.57%	30,000	—
LPCH notes and bonds payable			826,455	804,375
Unamortized issuance costs, premiums, and discounts, net			65,640	68,300
LPCH TOTAL			**$ 892,095**	**$ 872,675**
CONSOLIDATED TOTAL			**$ 7,074,844**	**$ 6,661,644**

**Exclusive of interest rate exchange agreements (see Note 8).*

The University borrows at tax-exempt rates through the California Educational Facilities Authority (CEFA), a conduit issuer. CEFA debt is a general unsecured obligation of the University. Although CEFA is the issuer, the University is responsible for the repayment of the tax-exempt debt. SHC and LPCH borrow at tax-exempt rates through the California Health Facilities Financing Authority (CHFFA). CHFFA debt is a general obligation of each of the hospitals. Payments of principal and interest on SHC's and LPCH's bonds are collateralized by a pledge of their respective revenues. Although CHFFA is the issuer, each hospital is responsible for the repayment of its respective tax-exempt debt.

The University's long-term ratings of AAA/Aaa/AAA were affirmed in March 2019 by S&P Global Ratings, Moody's Investors Service, and Fitch Ratings, respectively. In March and May 2019, SHC's long-term ratings were affirmed by S&P Global Ratings, Moody's Investors Service, and Fitch Ratings at AA-/Aa3/AA, respectively. In October and November 2019, LPCH's long-term ratings were affirmed by S&P Global Ratings, Moody's Investors Service, and Fitch Ratings at A+/A1/AA-, respectively.

SHC and LPCH are each party to separate master trust indentures that include, among other requirements, limitations on the incurrence of additional indebtedness, liens on property, restrictions on disposition or transfer of assets and compliance with certain financial ratios. Subject to applicable no-call provisions, SHC and LPCH may cause the redemption of the bonds, in whole or in part, prior to the stated maturities.

UNIVERSITY

Debt issuances and repayment activity

In April 2019, CEFA Series V-1 bonds were issued in the amount of $441.8 million plus an original issue premium of $158.2 million. The bonds bear interest at a coupon rate of 5.00%, with $41.8 million maturing on May 1, 2029 and $400 million maturing on May 1, 2049, and have yields of 1.83% and 3.12%, respectively. Proceeds are being used to finance or refinance capital projects of the University.

In March 2019, the University issued taxable fixed rate bonds (Series 2019) in the amount of $121.0 million. The bonds bear interest yield of 3.09% and mature on May 1, 2029. Proceeds may be used for general corporate purposes, but primarily are for financing and refinancing capital projects.

In August and November 2018, the University called and prepaid $262.2 million and $137.8 million, respectively, of the taxable Series 2009A bonds due in May 2019. The Series 2009A bonds totaling $1.0 billion issued for liquidity purposes in the wake of the 2009 financial crisis, are now fully paid down.

The University has two unsecured revolving credit facilities with a $250.0 million and $175.0 million capacity, respectively. Funds drawn on the revolving credit facilities bear interest at a floating rate equal to the applicable LIBOR rate plus a specified margin. The amount outstanding on these credit facilities was $55.6 millionand $75.9 million at August 31, 2019 and 2018, respectively.

In October 2017, a CEFA Series L tranche in the amount of $15.2 million matured and was repaid.

The University's taxable and tax-exempt commercial paper authorized borrowing capacity was $500.0 million and $300.0 million, respectively, at both August 31, 2019 and 2018. Tax-exempt commercial paper of $0.0 million and $130.0 million was outstanding at August 31, 2019 and 2018, respectively.

Variable rate debt subject to remarketing or tender

The University had $177.4 million of revenue bonds in variable rate mode outstanding at August 31, 2019. CEFA Series L bonds bear interest at a weekly rate and CEFA Series S bonds bear interest at a commercial paper municipal rate for various interest periods of 270 days or less. In the event the University receives notice of any optional tender of these bonds, or if the bonds become subject to mandatory tender, the purchase price of the bonds will be paid from the remarketing of such bonds. However, if the remarketing proceeds are insufficient, the University will have a current obligation to purchase the bonds tendered. The University has identified several sources of funding including cash, money market funds, U.S. Treasury securities and agencies' discount notes to provide for the full and timely purchase price of any bonds tendered in the event of a failed remarketing.

Letters of credit

In December 2010, the University entered into a credit agreement and established a letter of credit facility under which the bank agreed to issue standby letters of credit in a principal amount not to exceed $50.0 million. In June 2018, the University increased the facility to $75.0 million. At August 31, 2019, irrevocable standby letters of credit of $52.6 million were outstanding in the following amounts and for the following respective purposes: (1) $15.0 million to support collateral requirements under certain interest rate exchange agreements discussed in *Note 8*; (2) $32.7 million to serve as security for workers' compensation deductible insurance arrangements; and (3) $4.9 million for other purposes. No amounts have been drawn on these letters of credit at August 31, 2019.

SHC

Debt issuances and repayment activity

In January 2018, SHC issued taxable fixed rate bonds in the amount of $500.0 million. The bonds bear interest at a coupon rate and yield of 3.80% and mature on November 15, 2048. Proceeds will be used for general corporate purposes.

In December 2017, CHFFA, on behalf of SHC, issued fixed rate refunding revenue bonds (the "2017 Bonds") in the aggregate principal amount of $454.2 million plus an original issue premium of $76.1 million. Proceeds of the 2017 Bonds were used to advance refund a portion of the 2008 Series A bonds and the 2010 Series A and B bonds.

Variable rate debt subject to remarketing or tender

At August 31, 2019, SHC had $403.2 million of revenue bonds in variable rate mode outstanding. The 2008 Series B-1 bonds bear interest at a weekly rate, and bondholders have the option to tender their bonds on a weekly basis. The 2008 Series B-2 bonds bear interest at the commercial paper rate for each commercial paper period of 270 days or less. Bondholders in commercial paper mode have the option to tender their bonds only at the end of the commercial paper rate period.

The 2012 Series C bonds are in a windows weekly floating index mode and cannot be tendered for 180 days after a 30 day notice and remarketing period. The 2012 Series D and 2015 Series B bonds are also in a floating index mode with monthly interest rate resets. The 2012 Series D and 2015 Series B bonds are not subject to remarketing or tender until May 13, 2020 and June 28, 2024, respectively.

In the event SHC receives notice of any optional tender of the 2008 Series B-1 bonds or the 2012 Series C bonds, or if any bonds become subject to mandatory tender, the purchase price of the bonds will be paid from the remarketing of such bonds. However, if the remarketing proceeds are insufficient, SHC will have a current obligation to purchase any remaining bonds. SHC maintains sufficient liquidity to provide for the full and timely purchase price of any bonds tendered in the event of a failed remarketing.

Letters of credit

At August 31, 2019, SHC had irrevocable standby letters of credit in the aggregate amount of $21.2 million posted with certain beneficiaries in the following amounts and for the following respective purposes: (i) $19.0 million to serve as security for the workers' compensation self-insurance arrangement and (ii) $2.2 million to serve as security deposits for certain construction projects being undertaken by SHC including the Renewal Project (see *Note 20*). No amounts have been drawn on these letters of credit at August 31, 2019 and 2018.

LPCH

Debt activity

LPCH has a $200.0 million revolving credit facility with Bank of America which was set to expire in May 2020. Subsequent to year end, the revolving credit agreement was extended through November 2022. There was $30.0 million drawn on the line of credit as of August 31, 2019.

Letters of credit

At August 31, 2019, LPCH had irrevocable standby letters of credit in the aggregate amount of $7.7 million posted with certain beneficiaries in the following amounts and for the following respective purposes: (i) $6.3 million to serve as security for the workers' compensation self-insurance arrangement, and (ii) $1.4 million to serve as security deposits for certain construction projects being undertaken by LPCH including the Renewal Project (see *Note 20*). No amounts have been drawn on these letters of credit at August 31, 2019 and 2018.

INTEREST

Stanford's interest expense, which includes settlements under the interest rate exchange agreements, amortized bond issuance costs and amortized bond premium or discount, in thousands of dollars, is as follows:

	UNIVERSITY	SHC	LPCH	CONSOLIDATED
2019				
Interest expense, gross	$ 140,231	$ 67,921	$ 34,083	$ 242,235
Less:				
Interest income earned on unspent proceeds	(6,956)	—	—	(6,956)
Interest capitalized as a cost of construction	(28,864)	(28,861)	—	(57,725)
Interest expense on Series 2009A bonds which is classified as an investment expense	(8,474)	—	—	(8,474)
INTEREST EXPENSE, NET	**$ 95,937**	**$ 39,060**	**$ 34,083**	**$ 169,080**
2018				
Interest expense, gross	$ 149,051	$ 61,191	$ 36,390	$ 246,632
Less:				
Interest income earned on unspent proceeds	(9,643)	—	—	$ (9,643)
Interest capitalized as a cost of construction	(16,402)	(27,718)	(19,359)	$ (63,479)
Interest expense on Series 2009A bonds which is classified as an investment expense	(14,844)	—	—	$ (14,844)
INTEREST EXPENSE, NET	**$ 108,162**	**$ 33,473**	**$ 17,031**	**$ 158,666**

The University and SHC use interest rate exchange agreements to manage the interest rate exposure of their debt portfolios. University net payments on interest rate exchange agreements were $2.0 million and $2.5 million for the years ended August 31, 2019 and 2018, respectively. SHC net payments on interest rate exchange agreements were $12.6 million and $15.4 million for the years ended August 31, 2019 and 2018, respectively.

PRINCIPAL PAYMENTS

At August 31, 2019, scheduled principal payments on notes, bonds and capital lease obligations, in thousands of dollars, are as follows:

	PRINCIPAL PAYMENTS			
YEAR ENDING AUGUST 31	UNIVERSITY	SHC	LPCH	CONSOLIDATED
2020 Variable debt subject to remarketing	177,408	228,200	—	405,608
2020 Other	3,000	114,235	38,245	155,480
2021	179,685	16,045	8,635	204,365
2022	—	15,505	9,045	24,550
2023	51,765	17,065	9,490	78,320
2024	150,000	88,475	9,980	248,455
Thereafter	3,267,096	1,363,965	751,060	5,382,121
TOTAL	**$ 3,828,954**	**$ 1,843,490**	**$ 826,455**	**$ 6,498,899**

11. Net Assets

Net assets without donor restrictions include Board-designated funds functioning as endowment *(see Note 12)*, net investment in plant facilities and other operating funds.

Net assets with donor restrictions consist primarily of endowment gifts that are limited for long-term investment, and accumulated appreciation that may be appropriated for expenditure by the University (see *Note 12*). Net assets with donor restrictions also include gifts and pledges that are subject to donor-imposed restrictions that expire with the passage of time, payment of pledges, and/or actions of the University, and other funds including Stanford's net equity in split-interest agreements and student loans.

Net assets at August 31, 2019 and 2018, in thousands of dollars, are as follows:

	UNIVERSITY	SHC	LPCH	ELIMINATIONS	CONSOLIDATED
2019					
NET ASSETS WITHOUT DONOR RESTRICTIONS					
Board designated endowment - Funds functioning as endowment	$ 13,240,533	$ —	$ —	$ —	$ 13,240,533
Net investment in plant facilities and other plant funds	4,349,360	2,244,135	1,040,095	—	7,633,590
Operating funds	4,063,162	1,301,740	906,978	(80,312)	6,191,568
Total net assets without donor restrictions	21,653,055	3,545,875	1,947,073	(80,312)	27,065,691
NET ASSETS WITH DONOR RESTRICTIONS					
Subject to expenditure for specified purpose:					
Gifts with undecided purpose restrictions	472,781	—	—	—	472,781
Plant facilities	192,813	543,577	136,269	—	872,659
Total	665,594	543,577	136,269	—	1,345,440
Subject to passage of time:					
Pledges receivable	598,899	62,396	77,593	—	738,888
Other funds	257,229	46,447	38,505	—	342,181
Total	856,128	108,843	116,098	—	1,081,069
Subject to University's spending policy:					
Accumulated appreciation	7,286,048	14,922	112,042	—	7,413,012
Subject to restrictions in perpetuity:					
Endowment funds	7,058,573	9,431	234,361	—	7,302,365
Pledges receivable	722,758	—	148	—	722,906
Other funds	258,483	—	—	—	258,483
Total	8,039,814	9,431	234,509	—	8,283,754
Total net assets with donor restrictions	16,847,584	676,773	598,918	—	18,123,275
TOTAL NET ASSETS	**$38,500,639**	**$4,222,648**	**$2,545,991**	**$ (80,312)**	**$ 45,188,966**

	UNIVERSITY	SHC	LPCH	ELIMINATIONS	CONSOLIDATED
2018					
NET ASSETS WITHOUT DONOR RESTRICTIONS					
Board designated endowment - Funds functioning as endowment	$ 12,351,730	$ —	$ —	$ —	$ 12,351,730
Net investment in plant facilities and other plant funds	4,033,876	1,812,163	1,019,026	—	6,865,065
Operating funds	4,091,799	1,491,962	854,396	(63,803)	6,374,354
Total net assets without donor restrictions	20,477,405	3,304,125	1,873,422	(63,803)	25,591,149
NET ASSETS WITH DONOR RESTRICTIONS					
Subject to expenditure for specified purpose:					
Gifts with undecided purpose restrictions	458,109	—	—	—	458,109
Plant facilities	180,574	498,752	96,656	—	775,982
Total	638,683	498,752	96,656	—	1,234,091
Subject to passage of time:					
Pledges receivable	567,527	84,535	110,698	—	762,760
Other funds	226,372	51,557	26,650	—	304,579
Total	793,899	136,092	137,348	—	1,067,339
Subject to University's spending policy:					
Accumulated appreciation	7,273,097	13,982	111,330	—	7,398,409
Subject to restrictions in perpetuity:					
Endowment funds	6,777,977	8,233	227,813	—	7,014,023
Pledges receivable	753,642	—	175	—	753,817
Other funds	168,735	—	—	—	168,735
Total	7,700,354	8,233	227,988	—	7,936,575
Total net assets with donor restrictions	16,406,033	657,059	573,322	—	17,636,414
TOTAL NET ASSETS	**$36,883,438**	**$3,961,184**	**$2,446,744**	**$ (63,803)**	**$ 43,227,563**

12. Endowments

The University classifies a substantial portion of its financial resources as endowment, which is invested to generate income to support operating and strategic initiatives. The endowment, which includes endowed lands, is comprised of pure endowment funds, term endowment funds, and funds functioning as endowment (FFE). Depending on the nature of the donor's stipulation, these resources are recorded as net assets with donor restrictions or net assets without donor restrictions. Term endowments are similar to other endowment funds except that, upon the passage of a stated period of time or the occurrence of a particular event, all or part of the principal may be expended. Accordingly, term endowments are classified as net assets with donor restrictions until expiration of the term. FFE are University resources designated by the Board as endowment and are invested for long-term appreciation and current income. These assets, however, remain available and may be spent at the Board's discretion. Accordingly, FFE are recorded as net assets without donor restrictions.

Stanford classifies as net assets with donor restrictions (a) the original value of gifts donated to the endowment with donor restrictions and (b) accumulations to the endowment with donor restrictions made in accordance with the direction of the applicable donor gift instrument at the time the accumulation is added to the fund. The remaining accumulation to the endowment funds that are required to be maintained in perpetuity in accordance with the direction of the applicable donor gift instrument, is classified as net assets with donor restrictions until those amounts are authorized for expenditure. The aggregate amount by which fair value was below historic value was $487.4 thousand and $1.4 million at August 31, 2019 and 2018, respectively.

Endowment funds by net asset classification at August 31, 2019 and 2018, in thousands of dollars, are as follows:

	2019	2018
University endowment		
Endowment funds without donor restrictions:		
Funds functioning as endowment	$ 13,240,533	$ 12,351,730
Endowment funds with donor restrictions:		
Original donor-restricted gift amount and gains maintained in perpetuity	7,058,573	6,777,977
Term endowment and related gains	176,955	150,800
Additional accumulated gains available for expenditure, subject to spending policy	7,223,773	7,184,405
Total endowment funds with donor restrictions	14,459,301	14,113,182
University endowment	27,699,834	26,464,912
SHC endowment funds with donor restrictions	24,353	22,215
LPCH endowment funds with donor restrictions	362,229	353,374
TOTAL ENDOWMENT FUNDS	**$ 28,086,416**	**$ 26,840,501**

Most of Stanford's endowment is invested in the MP. The return objective for the MP is to generate optimal long-term total return while maintaining an appropriate level of risk. Investment returns are achieved through both capital appreciation (realized and unrealized gains) and current yield (interest and dividends). Portfolio asset allocation targets as well as expected risk, return and correlation among the asset classes are reevaluated regularly by Stanford Management Company.

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Changes in the University's endowment, excluding pledges, for the years ended August 31, 2019 and 2018, in thousands of dollars, are as follows:

	NET ASSETS WITHOUT DONOR RESTRICTIONS	NET ASSETS WITH DONOR RESTRICTIONS	TOTAL
2019			
Endowment, beginning of year	$ 12,351,730	$ 14,113,182	$ 26,464,912
Total investment returns, net	1,495,691	830,055	2,325,746
Amounts distributed for operations	(524,564)	(778,471)	(1,303,035)
Gifts, transfers and other changes in endowment:			
Current year gifts and pledge payments	5,301	229,370	234,671
Transfers of prior year gifts	3,864	65,541	69,405
EFP funds added to the endowment	23,622	—	23,622
Other funds withdrawn from the endowment, net	(115,111)	(376)	(115,487)
Total gifts, transfers and other changes in endowment	(82,324)	294,535	212,211
Total net increase in endowment	888,803	346,119	1,234,922
ENDOWMENT, END OF YEAR	**$ 13,240,533**	**$ 14,459,301**	**$ 27,699,834**
2018			
Endowment, beginning of year	$ 11,484,688	$ 13,300,255	$ 24,784,943
Total investment returns, net	1,166,116	1,221,518	2,387,634
Amounts distributed for operations	(506,513)	(733,233)	(1,239,746)
Gifts, transfers and other changes in endowment:			
Current year gifts and pledge payments	4,414	227,754	232,168
Transfers of prior year gifts	2,621	69,816	72,437
EFP funds added to the endowment	155,356	—	155,356
Other funds invested in the endowment	45,048	27,072	72,120
Total gifts, transfers and other changes in endowment	207,439	324,642	532,081
Total net increase in endowment	867,042	812,927	1,679,969
ENDOWMENT, END OF YEAR	**$ 12,351,730**	**$ 14,113,182**	**$ 26,464,912**

Approximately 18% of the University's endowment is invested in real estate on Stanford's lands, including the Stanford Research Park. This portion of the endowment includes the present value of ground leases, and rental properties that have been developed on Stanford lands. The net operating income from these properties is distributed each year for University operations.

Through the combination of investment strategy and payout policy, the University strives to provide a reasonably consistent payout from endowment to support operations, while preserving the purchasing power of the endowment adjusted for inflation.

The Board approves the amounts to be paid out annually from endowment funds invested in the MP. Consistent with the Uniform Prudent Management of Institutional Funds Act, when determining the appropriate payout the Board considers the purposes of the University and the endowment, the duration and preservation of the endowment, general economic conditions, the possible effect of inflation or deflation, the expected return from income and the appreciation of investments, other resources of the University, and the University's investment policy.

The current Board approved targeted spending rate is 5.5%. The payout amount is determined byapplying a smoothing rule designed to mitigate the impact of short-term market volatility on the flow of funds to support operations. The Board has the authority to override the smoothing rule and set the payout rate directly. The sources of payout are earned income on endowment assets (interest, dividends, rents and royalties), realized capital gains and FFE, as needed and as available.

The previously issued August 31, 2018 *Consolidated Financial Statements* have been revised to reflect "total investment returns, net" and "amounts distributed for operations" from donor restricted endowment funds in the appropriate net asset class. While there were no changes in the total amounts by net asset class, the correction resulted in an increase in "total investment returns, net" and "amounts distributed for operations" of $733.2 million within the net assets with donor restrictions category and a corresponding decrease of $733.2 million in "total investment returns, net" and "amounts distributed for operations" within the net assets without donor restrictions category. The corrections to the endowment roll forward are as follows:

	NET ASSETS WITHOUT DONOR RESTRICTIONS	NET ASSETS WITH DONOR RESTRICTIONS[1]	TOTAL
2018 AS PREVIOUSLY REPORTED			
Total investment returns, net	1,899,349	488,285	2,387,634
Amounts distributed for operations	(1,239,746)	—	(1,239,746)
TOTAL	**659,603**	**488,285**	**1,147,888**
2018 AS REVISED			
Total investment returns, net	1,166,116	1,221,518	2,387,634
Amounts distributed for operations	(506,513)	(733,233)	(1,239,746)
TOTAL	**659,603**	**488,285**	**1,147,888**

[1] *Reported in FY18 as temporarily restricted net assets and permanently restricted net assets*

Management has concluded that these revisions are not material to the *Consolidated Financial Statements* for the year ended August 31, 2018.

SHC AND LPCH

The endowments of SHC and LPCH are intended to generate investment income to support their current operating and strategic initiatives. The Hospitals invest the majority of their endowments in the University's MP. The endowments are subject to similar investment and spending strategies that the University employs. The Hospitals' Boards of Directors have approved payout policies which provide for annual amounts to be distributed for current use. "Amounts distributed for operations" in the tables below represents SHC's and LPCH's current year endowment payout spent for designated purposes during fiscal years 2019 and 2018.

SHC

All of SHC's endowment is with donor restrictions. Changes in SHC's endowment, excluding pledges, for the years ended August 31, 2019 and 2018, in thousands of dollars, are as follows:

	2019	2018
Endowments, beginning of year	$ 22,215	$ 20,711
Total investment returns, net	1,301	1,797
Amounts distributed for operations	(361)	(382)
Gifts and pledge payments	1,198	89
Total net increase in endowments	2,138	1,504
ENDOWMENT, END OF YEAR	**$ 24,353**	**$ 22,215**

LPCH

All of LPCH's endowment is with donor restrictions. Changes in LPCH's endowment, excluding pledges, for the years ended August 31, 2019 and 2018, in thousands of dollars, are as follows:

	2019	2018
Endowments, beginning of year	$ 353,374	$ 339,282
Total investment returns, net	18,944	29,245
Amounts distributed for operations	(15,774)	(14,187)
Gifts and pledge payments	7,252	869
Other	(1,567)	(1,835)
Total net increase in endowments	8,855	14,092
ENDOWMENT, END OF YEAR	**$ 362,229**	**$ 353,374**

13. Health Care Services Revenue

SHC and LPCH derive a majority of health care services revenue from contractual agreements with Medicare, Medi-Cal and other third-party payers that provide for payments at amounts different from established rates. Payments under these agreements and programs are based on a variety of payment models, including estimated retroactive audit adjustments under reimbursement agreements with third-party payers. Retroactive adjustments are estimated and recorded in the period the related services are rendered and adjusted in future periods, as final settlements are determined. Contracts, laws and regulations governing the Medicare and Medi-Cal programs are complex and subject to interpretation. As a result, it is reasonably possible that recorded estimates may change by a material amount in the near term.

A summary of payment arrangements with major third-party payers follows:

Medicare
Inpatient acute care services rendered to Medicare program beneficiaries are paid at prospectively determined rates per discharge. These rates vary according to a patient classification system that is based on clinical, diagnostic and other factors. Medicare reimburses hospitals for covered outpatient services rendered to its beneficiaries by way of an outpatient prospective payment system based on ambulatory payment classifications.

Inpatient non-acute services, certain outpatient services and medical education costs related to Medicare beneficiaries are paid based, in part, on a cost reimbursement methodology subject to final settlement after submission of annual cost reports and audits thereof by the Medicare fiscal intermediary. The estimated amounts due to or from the program are reviewed and adjusted annually based on the status of such audits and any subsequent appeals. Differences between final settlements and amounts accrued in previous years are reported as adjustments to net health care services revenue in the year examination is substantially completed. Medicare cost reports have been audited by the Medicare administrative contractor through August 31, 2010 for SHC and August 31, 2017 for LPCH.

Professional services are reimbursed based on a fee schedule.

Medi-Cal
The State reimburses hospitals for inpatient services rendered to Medi-Cal program beneficiaries based on a prospectively determined rate per discharge. Hospital outpatient and professional services are reimbursed based upon prospectively determined fee schedules.

The California Children's Services (“CCS”) Program is a partnership between state and counties that provides medical case management for children in California diagnosed with serious chronic diseases. Currently, approximately 70% of CCS-eligible children are also Medi-Cal eligible. The Medi-Cal program reimburses their care.

Managed Care Organizations
SHC and LPCH have entered into agreements with numerous third-party payers to provide patient care to beneficiaries under a variety of payment arrangements. These include arrangements with:

- Commercial insurance companies which reimburse at negotiated charges.
- Managed care contracts such as those with Health Maintenance Organizations (HMOs) and Preferred Provider Organizations (PPOs), which reimburse at contracted or per diem rates, which are usually less than full charges.
- Counties in the State of California, which reimburse for certain indigent patients covered under county contracts.

Uninsured

For uninsured patients that do not qualify for charity care, revenue is recognized on the basis of standard rates for services less an uninsured discount applied to the patient's account that approximates the average discount for managed care payers.

The following table presents health care services revenue, net of price concessions, for the years ended August 31, in thousands of dollars:

	UNIVERSITY	SHC	LPCH	ELIMINATIONS	CONSOLIDATED
2019					
Patient care revenue, net:					
Medicare	$ —	$ 937,369	$ 10,924	$ —	$ 948,293
Medi-Cal	—	150,184	418,841	—	569,025
Managed care	—	3,871,597	1,290,662	—	5,162,259
Self pay and other	—	115,527	117,334	—	232,861
Physician services and support (see *Note 1*)	1,166,935	38,375	—	(1,205,310)	—
Total patient care revenue, net	1,166,935	5,113,052	1,837,761	(1,205,310)	6,912,438
Premium revenue	—	106,130	—	—	106,130
Other services and support	43,286	—	—	(11,182)	32,104
HEALTH CARE SERVICES REVENUE, NET	**$1,210,221**	**$5,219,182**	**$1,837,761**	**$ (1,216,492)**	**$ 7,050,672**
2018					
Patient care revenue, net:					
Medicare	$ —	$ 892,195	$ 5,512	$ —	$ 897,707
Medi-Cal	—	140,788	362,300	—	503,088
Managed care	—	3,498,434	1,103,782	—	4,602,216
Self pay and other	—	160,605	80,871	—	241,476
Physician services and support (see *Note 1*)	1,048,749	43,344	—	(1,092,093)	—
Total patient care revenue, net	1,048,749	4,735,366	1,552,465	(1,092,093)	6,244,487
Premium revenue	—	92,654	—	—	92,654
Other services and support	40,672	—	—	(12,438)	28,234
	1,089,421	4,828,020	1,552,465	(1,104,531)	6,365,375
Provision for doubtful accounts[1]	—	(57,437)	(5,660)	—	(63,097)
HEALTH CARE SERVICES REVENUE, NET	**$1,089,421**	**$4,770,583**	**$1,546,805**	**$ (1,104,531)**	**$ 6,302,278**

[1] *Beginning in the year ended August 31, 2019, health care services revenue is required to be presented net of explicit and implicit price concessions, contractual allowances and any other adjustments.*

For the years ended August 31, 2019 and 2018, SHC recognized net health care services revenue adjustments of $20.3 million and $2.4 million, respectively, as a result of prior years' favorable developments related to reimbursement and appeals. LPCH had no significant adjustments to revenue for the years ended August 31, 2019 and 2018.

Charity Care and Uncompensated Costs

SHC's estimated cost of providing charity care was $24.0 million and $24.8 million, and LPCH's estimated cost of providing charity care was $2.7 million and $1.8 million for the years ended August 31, 2019 and 2018, respectively. This cost is estimated by calculating a ratio of total costs to gross patient service charges at established rates, and then multiplying that ratio by gross uncompensated patient service charges at established rates associated with providing care to charity patients. SHC received $410 thousand and $876 thousand during the years ended August 31, 2019 and 2018, respectively, from contributions that were restricted for the care of indigent patients.

SHC and LPCH also provide services to other patients under the Medicare, Medi-Cal and other publicly sponsored programs, which reimburse at amounts less than the cost of the services provided to the recipients. Estimated costs in excess of reimbursements for the Medicare, Medi-Cal and other publicly sponsored programs for the years ended August 31, 2019 and 2018 were $1.1 billion and $976.2 million for SHC, and $296.2 million and $298.1 million for LPCH, respectively.

Provider Fee

The State of California enacted legislation in 2009 as subsequently amended which established a Hospital Quality Assurance Fee (QAF) Program and a Hospital Fee Program. These programs impose a provider fee on certain California general acute care hospitals that, combined with federal matching funds, is used to provide supplemental payments to certain hospitals and support the State's effort to maintain health care coverage for children. California's participation in these programs was made permanent by a ballot initiative passed in November 2016. Specific portions of the program covering the period from January 1, 2017 to June 30, 2019, have not yet been approved by the Centers for Medicare and Medicaid Services (CMS). Accordingly, any potential activity under unapproved programs related to January 1, 2017 through August 31, 2019 have not been recorded in the *Consolidated Statements of Activities*.

Deferred revenue associated with unapproved programs will be recognized as revenue upon CMS approval. SHC recorded $31.6 million and $49.5 million in deferred revenue as of August 31, 2019 and 2018, respectively. LPCH recorded $23.3 million and $63.4 million in deferred revenue as of August 31, 2019 and 2018, respectively.

Provider fee revenue, net of expenses, under the approved portions of the programs for the years ended August 31, in thousands of dollars, is as follows:

	SHC	LPCH	CONSOLIDATED
2019			
Revenues	$ 93,880	$ 141,585	$ 235,465
Expenses	(39,544)	(33,319)	(72,863)
TOTAL	**$ 54,336**	**$ 108,266**	**$ 162,602**
2018			
Revenues	$ 89,718	$ 110,999	$ 200,717
Expenses	(77,302)	(25,852)	(103,154)
TOTAL	**$ 12,416**	**$ 85,147**	**$ 97,563**

14. Gifts and Pledges

Gifts and pledges reported for financial statement purposes are recorded on the accrual basis. The Office of Development (OOD), which is the primary fundraising agent for the University and SHC, reports total gifts based on contributions received in cash or property during the fiscal year. Lucile Packard Foundation for Children's Health (LPFCH) is the primary community fundraising agent for LPCH and the pediatric faculty and programs at the University's SOM. The following summarizes gifts and pledges reported for the years ended August 31, 2019 and 2018, per the *Consolidated Statements of Activities*, in thousands of dollars:

	UNIVERSITY	SHC	LPCH	CONSOLIDATED
2019				
Current year gifts in support of operations	$ 251,491	$ 244	$ 4,678	$ 256,413
Donor advised funds, net	8,518	—	—	8,518
Current year gifts not included in operations	3,251	—	—	3,251
Gifts and pledges, net - with donor restrictions	525,580	31,079	33,760	590,419
TOTAL	**$ 788,840**	**$ 31,323**	**$ 38,438**	**$ 858,601**
2018				
Current year gifts in support of operations	$ 278,867	$ 294	$ 3,951	$ 283,112
Donor advised funds, net	(6,489)	—	—	(6,489)
Current year gifts not included in operations	3,064	—	—	3,064
Gifts and pledges, net - with donor restrictions	487,523	44,983	42,788	575,294
TOTAL	**$ 762,965**	**$ 45,277**	**$ 46,739**	**$ 854,981**

15. Functional Expenses

Expenses are presented by functional classification in alignment with Stanford's mission of teaching, research and health care.

Major functional categories consist of the following:

- **Instruction and departmental research** include teaching and internally funded research expense.
- **Organized research - direct costs** include sponsored support costs.
- **Health care services** include patient care provided by SHC, LPCH, SOM faculty, and other health care related activities.
- **Auxiliary activities** include housing and dining services, intercollegiate athletics, Stanford Alumni Association, and other activities.
- **SLAC construction** includes the costs associated with major projects and facilities at the SLAC National Accelerator Laboratory.

Natural expenses attributable to more than one functional expense category are allocated using a variety of cost allocation techniques such as square footage and time and effort. Depreciation and facility operations and maintenance expense are allocated to the functional categories directly or based on the square footage occupancy. Salaries and benefits expense is allocated to functional categories directly based on time and effort incurred.

Expenses by functional and natural classification for the years ended August 31, 2019 and 2018 , in thousands of dollars, are as follows:

	SALARIES AND BENEFITS	DEPRECIATION	OTHER OPERATING EXPENSES	TOTAL EXPENSES
2019				
UNIVERSITY				
Instruction and departmental research	$ 1,407,946	$ 112,357	$ 568,588	$ 2,088,891
Organized research - direct costs	716,857	68,312	463,345	1,248,514
Health care services	778,973	3,442	17,719	800,134
Auxiliary activities	162,403	93,242	256,256	511,901
Administration and general	297,661	45,662	159,672	502,995
Student services	182,294	5,926	125,311	313,531
Libraries	70,054	66,156	52,515	188,725
Development	80,681	2,957	20,415	104,053
SLAC construction	71,326	—	137,997	209,323
TOTAL EXPENSES	**3,768,195**	**398,054**	**1,801,818**	**5,968,067**
SHC				
Health care services	2,082,191	171,008	2,279,215	4,532,414
Administration and general	219,615	19,128	221,659	460,402
Development	593	—	13,306	13,899
TOTAL EXPENSES	**2,302,399**	**190,136**	**2,514,180**	**5,006,715**
LPCH				
Health care services	726,588	103,686	831,537	1,661,811
Administration and general	83,641	9,286	107,981	200,908
Development	11,587	1	6,887	18,475
TOTAL EXPENSES	**821,816**	**112,973**	**946,405**	**1,881,194**
ELIMINATIONS				
Health care services	—	—	(1,159,890)	(1,159,890)
Administration and general	—	—	(43,865)	(43,865)
Development	—	—	(12,737)	(12,737)
TOTAL ELIMINATIONS	**—**	**—**	**(1,216,492)**	**(1,216,492)**
CONSOLIDATED				
Instruction and departmental research	1,407,946	112,357	568,588	2,088,891
Organized research - direct costs	716,857	68,312	463,345	1,248,514
Health care services	3,587,752	278,136	1,968,581	5,834,469
Auxiliary activities	162,403	93,242	256,256	511,901
Administration and general	600,917	74,076	445,447	1,120,440
Student services	182,294	5,926	125,311	313,531
Libraries	70,054	66,156	52,515	188,725
Development	92,861	2,958	27,871	123,690
SLAC construction	71,326	—	137,997	209,323
TOTAL EXPENSES	**$ 6,892,410**	**$ 701,163**	**$ 4,045,911**	**$11,639,484**

	SALARIES AND BENEFITS	DEPRECIATION	OTHER OPERATING EXPENSES	TOTAL EXPENSES
2018				
UNIVERSITY				
Instruction and departmental research	$ 1,310,686	$ 127,810	$ 528,963	$ 1,967,459
Organized research - direct costs	677,263	77,713	415,624	1,170,600
Health care services	706,791	2,601	18,262	727,654
Auxiliary activities	148,009	70,441	261,412	479,862
Administration and general	259,018	51,945	165,607	476,570
Student services	167,859	6,742	109,582	284,183
Libraries	69,950	39,528	50,155	159,633
Development	80,479	3,362	28,670	112,511
SLAC construction	75,251	—	216,226	291,477
TOTAL EXPENSES	**3,495,306**	**380,142**	**1,794,501**	**5,669,949**
SHC				
Health care services	1,884,218	155,181	2,079,861	4,119,260
Administration and general	206,561	21,414	229,747	457,722
Development	481	—	12,424	12,905
TOTAL EXPENSES	**2,091,260**	**176,595**	**2,322,032**	**4,589,887**
LPCH				
Health care services	640,134	90,586	743,173	1,473,893
Administration and general	90,172	8,748	87,961	186,881
Development	11,619	33	11,377	23,029
TOTAL EXPENSES	**741,925**	**99,367**	**842,511**	**1,683,803**
ELIMINATIONS				
Health care services	—	—	(1,050,187)	(1,050,187)
Administration and general	—	—	(42,659)	(42,659)
Development	—	—	(11,685)	(11,685)
TOTAL ELIMINATIONS	**—**	**—**	**(1,104,531)**	**(1,104,531)**
CONSOLIDATED				
Instruction and departmental research	1,310,686	127,810	528,963	1,967,459
Organized research - direct costs	677,263	77,713	415,624	1,170,600
Health care services	3,231,143	248,368	1,791,109	5,270,620
Auxiliary activities	148,009	70,441	261,412	479,862
Administration and general	555,751	82,107	440,656	1,078,514
Student services	167,859	6,742	109,582	284,183
Libraries	69,950	39,528	50,155	159,633
Development	92,579	3,395	40,786	136,760
SLAC construction	75,251	—	216,226	291,477
TOTAL EXPENSES	**$ 6,328,491**	**$ 656,104**	**$ 3,854,513**	**$10,839,108**

16. University Retirement Plans

The University provides retirement benefits through both defined contribution and defined benefit retirement plans for substantially all of its employees.

DEFINED CONTRIBUTION PLAN

The University offers a defined contribution plan to eligible faculty and staff through the *Stanford Contributory Retirement Plan* (SCRP). Employer contributions are based on a percentage of participant annual compensation, participant contributions and years of service. University and participant contributions are primarily invested in annuities and mutual funds. University contributions under the SCRP, which are vested immediately to participants, were approximately $179.3 million and $168.1 million for the years ended August 31, 2019 and 2018, respectively.

DEFINED BENEFIT PLANS

The University provides retirement and postretirement medical and other benefits through the *Staff Retirement Annuity Plan*, the *Faculty Retirement Incentive Program*, and the *Postretirement Benefit Plan* (the "Plans"). The obligations for the Plans, net of plan assets, are recorded in the *Consolidated Statements of Financial Position* as "accrued pension and postretirement benefit obligations." These plans are described in more detail below.

Staff Retirement Annuity Plan

Retirement benefits for certain employees are provided through the *Staff Retirement Annuity Plan* (SRAP), a noncontributory plan. While the SRAP is closed to new participants, certain employees continue to accrue benefits. Contributions to the plan are made in accordance with the Employee Retirement Income Security Act (ERISA) based on actuarially determined amounts sufficient to meet the benefits to be paid to plan participants.

In fiscal year 2018, the University purchased a group annuity contract for certain SRAP retirees. This resulted in a $21.7 million lump sum payment from plan assets and a permanent reduction in the plan benefit obligation and triggered a settlement event. This transaction and other routine payments resulted in additional net periodic benefit expense of approximately $4.8 million for the year ended August 31, 2018.

Faculty Retirement Incentive Program

The University provides a retirement incentive bonus for eligible faculty through the University *Faculty Retirement Incentive Program* (FRIP). The University's faculty may become eligible for the FRIP program if they commit to retire within a designated window of time. At August 31, 2019 and 2018, there were no program assets. The University funds benefit payouts as they are incurred.

Postretirement Benefit Plan

The University provides health care benefits for retired employees through its *Postretirement Benefit Plan* (PRBP). The University's employees and their covered dependents may become eligible for the PRBP upon the employee's retirement and meeting specific years of service and age criteria. Retiree health plans are paid for, in part, by retiree contributions, which are adjusted annually. The University's subsidy varies depending on whether the retiree is covered under the grandfathered design or the defined dollar benefit design. Medicare supplement options are provided for retirees over age 65.

The change in the Plans' assets, the related change in benefit obligations and the amounts recognized in the financial statements, in thousands of dollars, are as follows:

	SRAP	FRIP	PRBP	TOTAL
2019				
Fair value of plan assets, beginning of year	$ 249,433	$ —	$ 249,589	$ 499,022
Change in plan assets:				
Actual return on plan assets	30,969	—	14,192	45,161
Employer contributions	5,676	6,362	13,329	25,367
Plan participants' contributions	—	—	14,834	14,834
Benefits and plan expenses paid	(18,101)	(6,362)	(33,928) *	(58,391)
FAIR VALUE OF PLAN ASSETS, END OF YEAR	**267,977**	**—**	**258,016**	**525,993**
Benefit obligation, beginning of year	288,436	172,764	556,375	1,017,575
Change in projected benefit obligation:				
Service cost	1,429	9,800	16,347	27,576
Interest cost	10,958	6,730	22,718	40,406
Plan participants' contributions	—	—	14,834	14,834
Plan amendments	—	—	3,246	3,246
Actuarial loss	36,700	21,253	102,547	160,500
Benefits and plan expenses paid	(18,101)	(6,362)	(33,928) *	(58,391)
BENEFIT OBLIGATION, END OF YEAR	**319,422**	**204,185**	**682,139**	**1,205,746**
NET LIABILITY RECOGNIZED IN THE *STATEMENTS OF FINANCIAL POSITION*	**$ (51,445)**	**$(204,185)**	**$(424,123)**	**$ (679,753)**

** Net of Medicare subsidy of $1.5 million*

2018				
Fair value of plan assets, beginning of year	$ 282,461	$ —	$ 230,081	$ 512,542
Change in plan assets:				
Actual return on plan assets	8,523	—	21,925	30,448
Employer contributions	—	7,236	14,753	21,989
Plan participants' contributions	—	—	14,620	14,620
Benefits and plan expenses paid	(12,180)	(7,236)	(31,790) *	(51,206)
Plan settlements	(29,371)	—	—	(29,371)
FAIR VALUE OF PLAN ASSETS, END OF YEAR	**249,433**	**—**	**249,589**	**499,022**
Benefit obligation, beginning of year	330,234	174,447	571,951	1,076,632
Change in projected benefit obligation:				
Service cost	3,008	10,301	16,840	30,149
Interest cost	10,364	5,795	21,247	37,406
Plan participants' contributions	—	—	14,620	14,620
Plan amendments	4,564	—	—	4,564
Plan settlements	(29,371)	—	—	(29,371)
Actuarial gain	(18,183)	(10,543)	(36,493)	(65,219)
Benefits and plan expenses paid	(12,180)	(7,236)	(31,790) *	(51,206)
BENEFIT OBLIGATION, END OF YEAR	**288,436**	**172,764**	**556,375**	**1,017,575**
NET LIABILITY RECOGNIZED IN THE *STATEMENTS OF FINANCIAL POSITION*	**$ (39,003)**	**$(172,764)**	**$(306,786)**	**$ (518,553)**

** Net of Medicare subsidy of $1.8 million*

The accumulated benefit obligation for the SRAP was $318.5 million and $287.6 million at August 31, 2019 and 2018, respectively.

Net periodic benefit expense and non-operating activities related to the Plans for the years ended August 31, 2019 and 2018, in thousands of dollars, includes the following components:

	SRAP	FRIP	PRBP	TOTAL
2019				
Service cost	$ 1,429	$ 9,800	$ 16,347	$ 27,576
Interest cost	10,958	6,730	22,718	40,406
Expected return on plan assets	(11,970)	—	(16,223)	(28,193)
Amortization of:				
Prior service cost	960	—	—	960
Actuarial loss	627	—	—	627
NET PERIODIC BENEFIT EXPENSE	**2,004**	**16,530**	**22,842**	**41,376**
New prior service cost	—	—	3,246	3,246
Net actuarial loss	17,701	21,253	104,578	143,532
Amortization of:				
Prior service cost	(960)	—	—	(960)
Actuarial loss	(627)	—	—	(627)
TOTAL AMOUNTS RECOGNIZED IN NON-OPERATING ACTIVITIES	**16,114**	**21,253**	**107,824**	**145,191**
TOTAL AMOUNT RECOGNIZED IN NET PERIODIC BENEFIT EXPENSE AND NON-OPERATING ACTIVITIES	**$ 18,118**	**$ 37,783**	**$ 130,666**	**$ 186,567**
2018				
Service cost	$ 3,008	$ 10,301	$ 16,840	$ 30,149
Interest cost	10,364	5,795	21,247	37,406
Expected return on plan assets	(13,961)	—	(14,955)	(28,916)
Amortization of:				
Prior service cost	390	—	—	390
Actuarial loss	916	597	701	2,214
Settlement loss	4,779	—	—	4,779
NET PERIODIC BENEFIT EXPENSE	**5,496**	**16,693**	**23,833**	**46,022**
New prior service cost	4,564	—	—	4,564
Net actuarial gain	(12,745)	(10,543)	(43,463)	(66,751)
Amortization of:				
Prior service cost	(390)	—	—	(390)
Actuarial loss	(916)	(597)	(701)	(2,214)
Settlement loss	(4,779)	—	—	(4,779)
TOTAL AMOUNTS RECOGNIZED IN NON-OPERATING ACTIVITIES	**(14,266)**	**(11,140)**	**(44,164)**	**(69,570)**
TOTAL AMOUNT RECOGNIZED IN NET PERIODIC BENEFIT EXPENSE AND NON-OPERATING ACTIVITIES	**$ (8,770)**	**$ 5,553**	**$ (20,331)**	**$ (23,548)**

Cumulative amounts recognized in non-operating activities, but not yet recognized in net periodic benefit expense in the *Consolidated Statements of Activities*, are presented in the following table for the years ended August 31, 2019 and 2018, in thousands of dollars:

	SRAP	FRIP	PRBP	TOTAL
2019				
Prior service cost	$ 4,030	$ —	$ 3,246	$ 7,276
Net actuarial loss	61,127	38,027	126,980	226,134
ACCUMULATED PLAN BENEFIT COSTS NOT YET RECOGNIZED IN NET PERIODIC BENEFIT EXPENSE	**$ 65,157**	**$ 38,027**	**$ 130,226**	**$ 233,410**
2018				
Prior service cost	$ 4,990	$ —	$ —	$ 4,990
Net actuarial loss	44,053	16,774	22,402	83,229
ACCUMULATED PLAN BENEFIT COSTS NOT YET RECOGNIZED IN NET PERIODIC BENEFIT EXPENSE	**$ 49,043**	**$ 16,774**	**$ 22,402**	**$ 88,219**

The prior service costs and net actuarial loss expected to be amortized from non-operating activities to net periodic benefit expense in fiscal year 2020, in thousands of dollars, are as follows:

	SRAP	FRIP	PRBP	TOTAL
Prior service cost	$ 606	$ —	$ 373	$ 979
Net actuarial loss	$ 1,239	$ 1,022	$ 4,425	$ 6,686

ACTUARIAL ASSUMPTIONS

The weighted average assumptions used to determine the benefit obligations and net periodic benefit cost for the Plans are shown below:

	SRAP		FRIP		PRBP	
	2019	2018	2019	2018	2019	2018
BENEFIT OBLIGATIONS						
Discount rate	2.78%	4.00%	2.82%	4.02%	3.06%	4.16%
Covered payroll growth rate	3.00%	3.00%	4.25%	4.26%	N/A	N/A
NET PERIODIC BENEFIT COST						
Discount rate	4.00%	3.42%/3.53%*	4.02%	3.44%	4.16%	3.78%
Expected returns on plan assets	5.00%	5.50%	N/A	N/A	6.50%	6.50%
Covered payroll growth rate	3.00%	3.00%	4.26%	4.26%	N/A	N/A

** Reflects discount rates as of August 31, 2017 and November 30, 2017, respectively*

The expected long-term rate of return on asset assumptions for the SRAP and PRBP plans is 5.00% and 6.50%, respectively. The assumption is used in determining the expected returns on plan assets, a component of net periodic benefit expense (income), representing the expected return for the upcoming fiscal year on plan assets. This assumption is developed based on future expectations for returns in each asset class, as well as the target asset allocation of the portfolios. The use of expected long-term returns on plan assets may result in income that is greater or less than the actual returns of those plan assets in any given year. Over time, however, the expected long-term returns are designed to approximate the actual long-term returns, and therefore result in a pattern of income and cost recognition that more closely matches the pattern of the services provided by the employees. Differences between actual and expected returns are recognized as a

component of non-operating activities and amortized as a component of net periodic benefit expense (income) over the service or life expectancy of the plan participants, depending on the plan, provided such amounts exceed the accounting standards threshold.

To determine the accumulated PRBP obligation at August 31, 2019, a 6.25% annual rate of increase in the per capita cost of covered health care was assumed for calendar year 2019, declining gradually to 4.50% by 2038 and remaining at this rate thereafter.

Health care cost trend rate assumptions have a significant effect on the amounts reported for the health care plans. If the assumed health care cost trend were increased or decreased by 1%, the impact on the PRBP service and interest cost and the accumulated obligation are as follows, in thousands of dollars:

	1% INCREASE IN HEALTH CARE COST TREND RATE	1% DECREASE IN HEALTH CARE COST TREND RATE
Effect on PRBP total service and interest cost	$ 8,763	$ (6,706)
Effect on accumulated PRBP obligation	$ 129,855	$ (101,758)

EXPECTED CONTRIBUTIONS

The University expects to contribute $13.9 million to the FRIP, $1.5 million to the SRAP, and does not expect to contribute to the PRBP during the fiscal year ending August 31, 2020.

EXPECTED BENEFIT PAYMENTS

The following benefit payments, which reflect expected future service, are expected to be paid for the years ending August 31, in thousands of dollars:

			PRBP	
YEAR ENDING AUGUST 31	SRAP	FRIP	EXCLUDING MEDICARE SUBSIDY	EXPECTED MEDICARE PART D SUBSIDY
2020	$ 30,924	$ 13,926	$ 23,268	$ 2,122
2021	23,453	16,348	24,632	2,285
2022	23,012	12,929	26,032	2,449
2023	22,327	11,562	27,445	2,618
2024	20,663	12,471	28,924	2,787
2025 - 2029	89,575	64,956	167,493	16,704

INVESTMENT STRATEGY

The University's Retirement Program Investment Committee, acting in a fiduciary capacity, has established formal investment policies for the assets associated with the University's funded plans (SRAP and PRBP). The investment strategy of the plans is to preserve and enhance the value of the plans' assets within acceptable levels of risk. Investments in the plans are diversified among asset classes, striving to achieve an optimal balance between risk and return, and income and capital appreciation. Because the liabilities of each of the plans are long-term, the investment horizon is primarily long-term, with adequate liquidity to meet short-term benefit payment obligations.

CONCENTRATION OF RISK

The University manages a variety of risks, including market, credit, and liquidity risks, across its plan assets. Concentration of risk is defined as an undiversified exposure to one of the above-mentioned risks that increases the exposure of the loss of plan assets unnecessarily. Risk is minimized by predominately investing in broadly diversified index funds for public equities and fixed income. As of August 31, 2019, the University did not have concentrations of risk in any single entity, counterparty, sector, industry or country.

PLAN ASSETS AND ALLOCATIONS

Current U.S. GAAP defines a hierarchy of valuation inputs for the determination of the fair value of plan assets as described in *Note 6*. As of August 31, 2019 and 2018, all of the assets of the PRBP and substantially all of the assets of the SRAP were categorized as Level 1 investments. The fair value of plan assets by asset category, in thousands of dollars, at August 31, 2019 and 2018 and actual allocations and weighted-average target allocations at August 31, 2019 are as follows:

	2019	2018	2019 ACTUAL ALLOCATION	2019 TARGET ALLOCATION
SRAP:				
Cash and cash equivalents	$ 1,144	$ 2,039	<1%	0%
Public equities	100,872	99,934	38%	41%
Fixed income	165,902	147,383	62%	59%
Private equities	59	77	<1%	0%
TOTAL	**267,977**	**249,433**	**100%**	**100%**
PRBP:				
Public equities	194,243	188,310	75%	75%
Fixed income	63,773	61,279	25%	25%
TOTAL	**258,016**	**249,589**	**100%**	**100%**
TOTAL PLAN ASSETS AT FAIR VALUE	**$ 525,993**	**$ 499,022**		

17. SHC and LPCH Retirement Plans

SHC and LPCH provide retirement benefits through defined benefit and defined contribution retirement plans covering substantially all of its regular employees.

DEFINED CONTRIBUTION PLAN

The Hospitals offer a defined contribution plan to eligible employees. Employer contributions to the defined contribution retirement plan are based on a percentage of participant annual compensation, participant contributions and years of service. SHC and LPCH contributions under the plan, which are vested immediately to participants, were approximately $112.1 million and $111.4 million, and $44.3 million and $42.7 million for the years ended August 31, 2019 and 2018, respectively.

DEFINED BENEFIT PLANS

The Hospitals provide retirement and postretirement medical benefits through the SHC *Staff Pension Plan*, the SHC *Postretirement Medical Benefit Plan*, and the LPCH *Frozen Pension Plan*, collectively (the "Plans"). The obligations for the Plans, net of plan assets, are recorded in the *Consolidated Statements of Financial Position* as "accrued pension and postretirement benefit obligations." These plans are described in more detail below.

Staff Pension Plan

Certain employees of SHC and LPCH are covered by the SHC *Staff Pension Plan* (the "Pension Plan"), a noncontributory, defined benefit pension plan. While the Pension Plan is closed to new participants, certain employees continue to accrue benefits. Benefits are based on years of service and the employee's compensation. Contributions to the plan are made in accordance with ERISA based on actuarially determined amounts sufficient to meet the benefits to be paid to plan participants. SHC and LPCH have an arrangement whereby SHC assumes the pension liability of the LPCH employees and previously leased employees. However, LPCH is required to reimburse SHC for the annual expense incurred for these employees and previously leased employees.

During the year ended August 31, 2018, SHC purchased a group annuity contract for certain SHC Staff Pension Plan retirees. This resulted in a $41.2 million payment from plan assets and a permanent reduction in the plan's benefit obligation and triggered a settlement event. The transaction resulted in additional net periodic benefit expense of $12.1 million for the year ended August 31, 2018.

Postretirement Medical Benefit Plan

SHC and LPCH provide health care benefits for certain retired employees through the SHC *Postretirement Medical Benefit Plan* (PRMB). The Hospitals' employees and their covered dependents may become eligible for the PRMB upon the employee's retirement as early as age 55, with years of service as defined by specific criteria. Retiree health plans are paid, in part, by retiree contributions, which are adjusted annually. The Hospitals' subsidies vary depending on whether the retiree is covered under the grandfathered design or the defined dollar benefit design. Medicare supplement options are provided for retirees over age 65. LPCH reimburses SHC for costs related to this plan on a periodic basis.

Frozen Pension Plan

The remainder of certain other LPCH employees and previously leased employees not covered by the previously described plans are covered by a frozen noncontributory defined benefit pension plan (the "LPCH *Frozen Pension Plan*"). Benefits are based on years of service and the employee's compensation. Contributions to the plan are made in accordance with ERISA based on actuarially determined amounts sufficient to meet the benefits to be paid to plan participants.

The change in the Plans' assets, the related change in benefit obligations and the amounts recognized in the financial statements, in thousands of dollars, are as follows:

	STAFF PENSION PLAN	PRMB	LPCH FROZEN PENSION PLAN
2019			
Fair value of plan assets, beginning of year	$ 180,930	$ —	$ 6,108
Change in plan assets:			
Actual return on plan assets	23,736	—	883
Employer contributions	—	5,033	729
Plan participants' contributions	—	1,324	—
Benefits and plan expenses paid	(10,727)	(6,357) *	(440)
Plan settlements	(297)	—	(408)
FAIR VALUE OF PLAN ASSETS, END OF YEAR	**193,642**	**—**	**6,872**
Benefit obligation, beginning of year	187,580	77,544	7,953
Change in projected benefit obligation:			
Service cost	1,197	2,235	—
Interest cost	7,416	2,928	304
Plan participants' contributions	—	1,324	—
Actuarial loss	25,224	9,652	8
Benefits and plan expenses paid	(10,727)	(6,357) *	(440)
Plan amendments	—	13,767	—
Plan settlements	—	—	(408)
BENEFIT OBLIGATION, END OF YEAR	**210,690**	**101,093**	**8,291**
NET LIABILITY RECOGNIZED IN THE *STATEMENTS OF FINANCIAL POSITION*	**$ (17,048)**	**$ (101,093)**	**$ (1,419)**

** Net of Medicare subsidy of $0*

2018			
Fair value of plan assets, beginning of year	$ 193,476	$ —	$ 6,086
Change in plan assets:			
Actual return on plan assets	7,477	—	133
Employer contributions	34,800	5,098	400
Plan participants' contributions	—	860	—
Benefits and plan expenses paid	(13,619)	(5,958) *	(511)
Plan settlements	(41,204)	—	—
FAIR VALUE OF PLAN ASSETS, END OF YEAR	**180,930**	**—**	**6,108**
Benefit obligation, beginning of year	245,221	84,179	8,447
Change in projected benefit obligation:			
Service cost	1,611	2,501	—
Interest cost	8,485	2,685	280
Plan participants' contributions	—	860	—
Actuarial gain	(12,914)	(6,052)	(263)
Benefits and plan expenses paid	(13,619)	(5,958) *	(511)
Plan amendments	—	(671)	—
Plan settlements	(41,204)	—	—
BENEFIT OBLIGATION, END OF YEAR	**187,580**	**77,544**	**7,953**
NET LIABILITY RECOGNIZED IN THE *STATEMENTS OF FINANCIAL POSITION*	**$ (6,650)**	**$ (77,544)**	**$ (1,845)**

** Net of Medicare subsidy of $289 thousand*

The net liability for the PRMB includes amounts for both SHC and LPCH employees and is recognized on the Hospitals' respective *Statements of Financial Position*. The table below presents the plan obligations for each entity as of August 31, 2019 and 2018, in thousands of dollars:

	2019	2018
SHC	$ 76,491	$ 60,146
LPCH	24,602	17,398
TOTAL	**$ 101,093**	**$ 77,544**

The accumulated benefit obligation for the Pension Plan and LPCH Frozen Pension Plan was $208.9 million and $186.2 million, and $8.3 million and $8.0 million at August 31, 2019 and 2018, respectively.

Net periodic benefit expense and non-operating activities related to the Plans for the years ended August 31, 2019 and 2018, in thousands of dollars, includes the following components:

	STAFF PENSION PLAN	PRMB	LPCH FROZEN PENSION PLAN
2019			
Service cost	$ 1,197	$ 2,235	$ —
Interest cost	7,416	2,928	304
Expected return on plan assets	(9,742)	—	(258)
Amortization of:			
Prior service cost	—	1,426	—
Actuarial loss (gain)	1,361	(924)	113
Settlement loss	—	—	121
NET PERIODIC BENEFIT EXPENSE	**232**	**5,665**	**280**
Net actuarial loss	11,525	9,652	257
New prior service cost	—	13,767	—
Amortization of:			
Prior service cost	—	(1,426)	—
Actuarial gain (loss)	(1,361)	924	(234)
TOTAL AMOUNTS RECOGNIZED IN NON-OPERATING ACTIVITIES	**10,164**	**22,917**	**23**
TOTAL AMOUNT RECOGNIZED IN NET PERIODIC BENEFIT EXPENSE AND NON-OPERATING ACTIVITIES	**$ 10,396**	**$ 28,582**	**$ 303**
2018			
Service cost	$ 1,611	$ 2,501	$ —
Interest cost	8,485	2,685	280
Expected return on plan assets	(12,786)	—	(291)
Amortization of:			
Prior service cost	—	1,602	—
Actuarial loss (gain)	2,605	(580)	121
Settlement loss	12,094	—	—
NET PERIODIC BENEFIT EXPENSE	**12,009**	**6,208**	**110**
Net actuarial gain	(7,604)	(6,052)	(104)
New prior service cost	—	(671)	—
Amortization of:			
Prior service cost	—	(1,602)	—
Actuarial gain (loss)	(14,699)	580	(121)
TOTAL AMOUNTS RECOGNIZED IN NON-OPERATING ACTIVITIES	**(22,303)**	**(7,745)**	**(225)**
TOTAL AMOUNT RECOGNIZED IN NET PERIODIC BENEFIT EXPENSE AND NON-OPERATING ACTIVITIES	**$ (10,294)**	**$ (1,537)**	**$ (115)**

The net periodic benefit expense and amounts recognized in non-operating activities for the PRMB include amounts for both SHC and LPCH employees and is recognized on the Hospitals' respective *Statements of Activities*. The table below presents the amount for each entity as of August 31, 2019 and 2018, in thousands of dollars:

	SHC	LPCH	TOTAL
2019			
Net periodic benefit expense	$ 4,129	$ 1,536	$ 5,665
Amounts recognized in non-operating activities	16,258	6,659	22,917
TOTAL AMOUNT RECOGNIZED IN NET PERIODIC BENEFIT EXPENSE AND NON-OPERATING ACTIVITIES	**$ 20,387**	**$ 8,195**	**$ 28,582**
2018			
Net periodic benefit expense	$ 4,596	$ 1,612	$ 6,208
Amounts recognized in non-operating activities	(5,974)	(1,772)	(7,746)
TOTAL AMOUNT RECOGNIZED IN NET PERIODIC BENEFIT EXPENSE AND NON-OPERATING ACTIVITIES	**$ (1,378)**	**$ (160)**	**$ (1,538)**

Cumulative amounts recognized in non-operating activities, but not yet recognized in net periodic benefit expense in the *Consolidated Statements of Activities*, are presented in the following table for the years ended August 31, 2019 and 2018, in thousands of dollars:

	STAFF PENSION PLAN	PRMB	LPCH FROZEN PENSION PLAN
2019			
Prior service cost	$ —	$ 17,704	$ —
Net actuarial loss (gain)	65,223	(4,013)	2,453
ACCUMULATED PLAN BENEFIT COSTS NOT YET RECOGNIZED IN NET PERIODIC BENEFIT EXPENSE	**$ 65,223**	**$ 13,691**	**$ 2,453**
2018			
Prior service cost	$ —	$ 5,363	$ —
Net actuarial loss (gain)	55,059	(14,589)	2,430
ACCUMULATED PLAN BENEFIT COSTS NOT YET RECOGNIZED IN NET PERIODIC BENEFIT EXPENSE	**$ 55,059**	**$ (9,226)**	**$ 2,430**

The prior service cost and net actuarial loss expected to be amortized from non-operating activities to net periodic benefit expense in fiscal year 2020, in thousands of dollars, are as follows:

	STAFF PENSION PLAN	PRMB	LPCH FROZEN PENSION PLAN
Prior service cost	$ —	$ 2,560	$ —
Net actuarial loss (gain)	$ 2,277	$ (251)	$ 91

ACTUARIAL ASSUMPTIONS

The weighted average assumptions used to determine the benefit obligations and net periodic benefit cost for the Plans are shown below:

	STAFF PENSION PLAN		PRMB		LPCH FROZEN PENSION PLAN	
	2019	2018	2019	2018	2019	2018
BENEFIT OBLIGATIONS						
Discount rate	2.88%	4.07%	2.77%	3.96%	2.80%	4.01%
Covered payroll growth rate	3.00%	3.00%	N/A	N/A	N/A	N/A
NET PERIODIC BENEFIT COST						
Discount rate	4.07%	3.56%	3.96%	3.33%	4.01%	3.46%
Expected return on plan assets	5.50%	6.00%	N/A	N/A	4.50%	5.00%
Covered payroll growth rate	3.00%	3.00%	N/A	N/A	N/A	N/A

The expected long-term rate of return on asset assumptions for the Pension Plan and LPCH Frozen Pension Plan are 5.50% and 4.50%, respectively. The assumption is used in determining the expected returns on plan assets, a component of net periodic benefit expense (income), representing the expected return for the upcoming fiscal year on plan assets based on the calculated market-related value of plan assets. This assumption is developed based on future expectations for returns in each asset class, as well as the target asset allocation of the portfolios. The use of expected long-term returns on plan assets may result in income that is greater or less than the actual returns of those plan assets in any given year. Over time, however, the expected long-term returns are designed to approximate the actual long-term returns, and therefore result in a pattern of income and cost recognition that more closely matches the pattern of the services provided by the employees. Differences between actual and expected returns are recognized as a component of non-operating activities and amortized as a component of net periodic benefit expense (income) over the service or life expectancy of the plan participants, depending on the plan, provided such amounts exceed the accounting standards threshold.

To determine the accumulated PRMB obligation at August 31, 2019, a 6.25% annual rate of increase in the per capita cost of covered health care was assumed for calendar year 2019, declining gradually to 4.50% by 2038 and remaining at this rate thereafter.

Health care cost trend rate assumptions have a significant effect on the amounts reported for the health care plan. If the assumed health care cost trend were increased or decreased by 1%, the impact on PRMB service and interest cost and accumulated obligation are as follows, in thousands of dollars:

	1% INCREASE IN HEALTH CARE COST TREND RATE	1% DECREASE IN HEALTH CARE COST TREND RATE
Effect on PRMB total service and interest cost	$ 116	$ (121)
Effect on accumulated PRMB obligation	$ 2,131	$ (2,110)

EXPECTED CONTRIBUTIONS

SHC expects to contribute $5.4 million to the PRMB and does not expect to contribute to the Pension Plan during the fiscal year ending August 31, 2020. LPCH expects to contribute $1.1 million to the LPCH Frozen Pension Plan during the fiscal year ending August 31, 2020.

EXPECTED BENEFIT PAYMENTS

The following benefit payments, which reflect expected future service, are expected to be paid for the fiscal years ending August 31, in thousands of dollars:

YEAR ENDING AUGUST 31	STAFF PENSION PLAN	PRMB EXCLUDING MEDICARE SUBSIDY	PRMB EXPECTED MEDICARE PART D SUBSIDY	LPCH FROZEN PENSION PLAN
2020	$ 11,141	$ 7,248	$ 283	$ 753
2021	11,512	7,363	134	665
2022	11,801	7,527	130	604
2023	11,989	7,565	124	584
2024	12,120	7,521	118	554
2025 - 2029	60,958	37,335	482	2,440

INVESTMENT STRATEGY

SHC's and LPCH's investment strategies for the Pension Plan and LPCH Frozen Pension Plan is to maximize the total rate of return (income and appreciation) within the limits of prudent risk taking and Section 404 of ERISA. The funds are diversified across asset classes to achieve an optimal balance between risk and return and between income and capital appreciation. Because the liabilities of each of the plans are long-term, the investment horizon is primarily long-term, with adequate liquidity to meet short-term benefit payment obligations.

CONCENTRATION OF RISK

SHC and LPCH manage a variety of risks, including market, credit, and liquidity risks, across its plan assets. Concentration of risk is defined as an undiversified exposure to one of the above-mentioned risks that increases the exposure of the loss of plan assets unnecessarily. Risk is minimized by diversifying the Hospitals' exposure to such risks across a variety of instruments, markets, and counterparties. As of August 31, 2019, the Hospitals did not have concentrations of risk in any single entity, counterparty, sector, industry or country.

PLAN ASSETS AND ALLOCATIONS

Current U.S. GAAP defines a hierarchy of valuation inputs for the determination of the fair value of plan assets as described in *Note 6*. The Plans' assets measured at fair value at August 31, 2019 and 2018, are all categorized as Level 1 investments. The fair value of plan assets by asset category, in thousands of dollars, at August 31, 2019 and 2018 and actual allocations and weighted-average target allocations at August 31, 2019 are as follows:

	2019	2018	2019 ACTUAL ALLOCATION	2019 TARGET ALLOCATION
STAFF PENSION PLAN:				
Cash and cash equivalents	$ 483	$ 683	<1%	—%
Public equities	77,598	72,009	40%	40%
Fixed income	115,561	108,238	60%	60%
PLAN ASSETS AT FAIR VALUE	**$ 193,642**	**$ 180,930**	**100%**	**100%**
LPCH FROZEN PENSION PLAN:				
Cash and cash equivalents	$ 30	$ 30	<1%	—%
Public equities	2,058	1,828	30%	30%
Fixed income	4,784	4,250	70%	70%
PLAN ASSETS AT FAIR VALUE	**$ 6,872**	**$ 6,108**	**100%**	**100%**

18. Operating Leases

Stanford leases certain equipment and facilities under operating leases expiring at various dates. Total rental expense under these leases for the years ended August 31, 2019 and 2018 was $89.8 million and $79.7 million, respectively, for the University, $122.6 million and $116.3 million, respectively, for SHC, and $30.7 million and $28.6 million, respectively, for LPCH.

Net minimum future operating lease payments for periods subsequent to August 31, 2019, in thousands of dollars, are as follows:

	MINIMUM LEASE PAYMENTS			
YEAR ENDING AUGUST 31	UNIVERSITY	SHC	LPCH	CONSOLIDATED
2020	$ 59,210	$ 79,271	$ 25,789	$ 164,270
2021	37,626	73,406	20,672	131,704
2022	36,109	70,468	16,514	123,091
2023	33,548	64,352	15,992	113,892
2024	30,998	40,570	13,648	85,216
Thereafter	115,146	73,019	63,217	251,382
TOTAL	**$ 312,637**	**$ 401,086**	**$ 155,832**	**$ 869,555**

19. Related Party Transactions

Members of the University, SHC, and LPCH boards and senior management may, from time to time, be associated, either directly or indirectly, with companies doing business with Stanford.

The University, SHC and LPCH have separate written conflict of interest policies that require, among other items, that no member of their respective board can participate in any decision in which he or she (or an immediate family member) has a material financial interest. Each board member is required to certify compliance with his or her respective entity's conflict of interest policy on an annual basis and indicate whether his or her respective entity does business with any entity in which the board member has a material financial interest. When such relationships exist, measures are taken to mitigate any actual or perceived conflict, including requiring that such transactions be conducted at arm's length, for good and sufficient consideration, based on terms that are fair and reasonable to and for the benefit of the respective entity, and in accordance with applicable conflict of interest laws and policies. No such associations are considered to be significant.

The University, SHC, and LPCH each requires its senior management to disclose annually any significant financial interests in, or employment or consulting relationships with, entities doing business with it. These annual disclosures cover both senior management and their immediate family members. When such relationships exist, measures are taken to appropriately manage the actual or perceived conflict in the best interests of the relevant entity. No such associations are considered to be significant.

20. Commitments and Contingencies

Management is of the opinion that none of the following commitments and contingencies will have a material adverse effect on Stanford's consolidated financial position.

SPONSORED SUPPORT

As described in *Note 1*, costs recovered by the University as sponsored support are subject to audit and adjustment. Fringe benefit costs for the fiscal years ended August 31, 2016 to 2019 are subject to audit. The University does not anticipate any material adjustments to the *Consolidated Financial Statements*.

HEALTH CARE

As described in *Note 13*, cost reports filed under the Medicare program for services based upon cost reimbursement are subject to audit. The estimated amounts due to or from the program are reviewed and adjusted annually based upon the status of such audits and subsequent appeals.

The health care industry is subject to numerous laws and regulations of federal, state and local governments. Compliance with these laws and regulations can be subject to future government review and interpretation, as well as to regulatory actions unknown or unasserted at this time. Government activity with respect to investigations and allegations concerning possible violations of regulations by health care providers could result in the imposition of significant fines and penalties, as well as significant repayments for patient services previously billed. SHC and LPCH are subject to similar regulatory reviews, and while such reviews may result in repayments and civil remedies that could have a material effect on their respective financial results of operations in a given period, SHC's and LPCH's management believes that such repayments and civil remedies would not have a material effect on the financial position of SHC and LPCH, respectively.

INFORMATION PRIVACY AND SECURITY

As with many medical centers and universities across the country, information privacy and security is a significant enterprise risk area, owing to persistent and pervasive cyber threats along with expanding regulatory compliance obligations and enforcement. The University, SHC and LPCH have programs in place to safeguard important systems and protected information, yet significant incidents have occurred in the past and may occur in the future involving potential or actual disclosure of such information (including, for example, personally identifiable information relating to employees, students, patients or research participants). In most cases, there has been no evidence of unauthorized access to, or use/disclosure of, such information, yet privacy laws may require reporting to potentially affected individuals as well as federal, state and international governmental agencies. Governmental agencies have the authority to investigate and request further information about an incident or safeguards, to cite the University, SHC or LPCH for a deficiency or regulatory violation, and/or require payment of fines, corrective action, or both. California law also allows a private right to sue for a breach of medical information. To date, the cost of such possible consequences has not been material to the University, SHC or LPCH, and management does not believe that any future consequences of these identified incidents will be material to the *Consolidated Financial Statements*.

LABOR AGREEMENTS

Approximately 7% of the University's, 29% of SHC's and 43% of LPCH's employees are covered under union contract arrangements and are, therefore, subject to labor stoppages when contracts expire. There are currently no expired contracts under these union contract arrangements. The University's agreements with the Stanford Deputy Sheriffs' Association and the Service Employees International Union (SEIU) will expire in 2020 and 2024, respectively. SHC's and LPCH's agreements with SEIU and the Committee for Recognition of Nursing Achievement (CRONA) will expire in 2020 and 2022, respectively.

GUARANTEES AND INDEMNIFICATIONS

Stanford enters into indemnification agreements with third parties in the normal course of business. The impact of these agreements, individually or in the aggregate, is not expected to be material to the *Consolidated Financial Statements*. As a result, no liabilities related to guarantees and indemnifications have been recorded at August 31, 2019.

LITIGATION

The University, SHC and LPCH are defendants in a number of legal actions. While the final outcome cannot be determined at this time, management is of the opinion that the liability, if any, resulting from these legal actions will not have a material adverse effect on the consolidated financial position.

MEDICAL CENTER RENEWAL PROJECT

In July 2011, Stanford obtained local approval for a Renewal Project to rebuild SHC and expand LPCH to assure adequate capacity and provide modern, technologically-advanced hospital facilities. The Renewal Project includes replacement of outdated laboratory facilities at the Stanford SOM.

California's Hospital Seismic Safety Act requires licensed acute care functions to be conducted only in facilities that meet specified seismic safety standards which have varying deadlines. The Renewal Project as approved is also designed to meet these standards and deadlines.

The sources of funding for the Renewal Project include operating surpluses, gifts, government grants, and bond proceeds. During the year ended August 31, 2018, LPCH opened the majority of their new expanded facilities and expects to complete the remaining components of its portion of the Renewal Project in fiscal year 2020. SHC's share of the estimated total cost of the Renewal Project is $2.2 billion and construction was completed in the fall of 2019. Through August 31, 2019, SHC has recorded $2.1 billion in construction in progress, exclusive of $180.0 million in capitalized interest.

The first of the replacement SOM laboratory facilities is currently under construction and is scheduled to be completed in 2020. Additional research facilities, which will allow for the full replacement of the outdated laboratory facilities, will be completed in subsequent years.

CONTRACTUAL COMMITMENTS

At August 31, 2019, the University had contractual obligations of approximately $657.5 million in connection with major construction projects. Remaining expenditures on construction in progress are estimated to be $1.0 billion, which will be financed with certain unexpended plant funds, gifts and debt. Commitments on construction contracts, including the construction and remodeling of Hospital facilities, were approximately $227.7 million for SHC and $61.5 million for LPCH at August 31, 2019.

The University executed two 25-year agreements with two solar electricity developers and operators in 2015 and 2018 to purchase the output from their solar photovoltaic facilities. The first facility was placed in service in December 2016 and the second facility is expected to be placed in service in December 2021. The minimum energy purchase requirements are expected to be well within the University's current consumption. The University's total payment under the agreements over the life of the agreements, undiscounted, is $270.1 million.

In addition, as described in *Note 6*, the University is obligated under certain alternative investment agreements to advance additional funding up to specified levels over a period of years.

21. Subsequent Events

Stanford has evaluated subsequent events for the period from August 31, 2019 through December 3, 2019, the date the *Consolidated Financial Statements* were issued.

IMPACT OF COVID-19 (UNAUDITED)

The outbreak of COVID-19 has caused domestic and global disruption in operations that may materially affect the ability of the University to conduct its operations. In addition, COVID-19 has negatively impacted the financial markets and may continue to materially affect the value of the University's investments and other revenue streams. The full impact of COVID-19 on the University's operations cannot be fully determined at this time.

22. Consolidating Entity Statements

The pages which follow present consolidating statements of financial position as of August 31, 2019 and 2018, and consolidating statements of activities and cash flows for the years then ended, in thousands of dollars.

CONSOLIDATING STATEMENTS OF FINANCIAL POSITION

At August 31, 2019 (in thousands of dollars)

	UNIVERSITY	SHC	LPCH	ELIMINATIONS	CONSOLIDATED
ASSETS					
Cash and cash equivalents	$ 856,553	$ 505,509	$ 276,822	$ (7,316)	$ 1,631,568
Assets limited as to use	291,679	11	—	—	291,690
Accounts receivable, net	249,783	751,712	427,956	—	1,429,451
Receivables (payables) from SHC and LPCH, net	98,832	—	—	(98,832)	—
Prepaid expenses and other assets	140,611	295,524	96,544	(83,907)	448,772
Pledges receivable, net	1,321,657	62,396	144,393	(58,760)	1,469,686
Student loans receivable, net	51,998	—	—	—	51,998
Faculty and staff mortgages and other loans receivable, net	797,088	—	—	—	797,088
Investments at fair value, including securities pledged or on loan of $19,251	35,291,628	2,535,747	984,513	7,316	38,819,204
Plant facilities, net of accumulated depreciation	7,270,282	3,691,015	1,902,190	—	12,863,487
Works of art and special collections	—	—	—	—	—
TOTAL ASSETS	**$ 46,370,111**	**$ 7,841,914**	**$ 3,832,418**	**$ (241,499)**	**$ 57,802,944**
LIABILITIES AND NET ASSETS					
LIABILITIES:					
Accounts payable and accrued expenses	$ 902,563	$ 1,447,709	$ 329,515	$ (161,187)	$ 2,518,600
Accrued pension and postretirement benefit obligations	679,753	93,539	26,021	—	799,313
Liabilities associated with investments	758,161	—	—	—	758,161
Deferred income and other obligations	1,241,915	142,604	38,796	—	1,423,315
Notes and bonds payable	4,247,335	1,935,414	892,095	—	7,074,844
U.S. government refundable loan funds	39,745	—	—	—	39,745
TOTAL LIABILITIES	**7,869,472**	**3,619,266**	**1,286,427**	**(161,187)**	**12,613,978**
NET ASSETS:					
Without donor restrictions, including non-controlling interest attributable to SHC of $80,312	21,653,055	3,545,875	1,947,073	(80,312)	27,065,691
With donor restrictions	16,847,584	676,773	598,918	—	18,123,275
TOTAL NET ASSETS	**38,500,639**	**4,222,648**	**2,545,991**	**(80,312)**	**45,188,966**
TOTAL LIABILITIES AND NET ASSETS	**$ 46,370,111**	**$ 7,841,914**	**$ 3,832,418**	**$ (241,499)**	**$ 57,802,944**

CONSOLIDATING STATEMENTS OF FINANCIAL POSITION

At August 31, 2018 (in thousands of dollars)

	UNIVERSITY	SHC	LPCH	ELIMINATIONS	CONSOLIDATED
ASSETS					
Cash and cash equivalents	$ 265,795	$ 652,256	$ 288,469	$ (7,153)	$ 1,199,367
Assets limited as to use	165,429	—	—	—	165,429
Accounts receivable, net	285,038	670,267	343,640	—	1,298,945
Receivables (payables) from SHC and LPCH, net	114,219	—	—	(114,219)	—
Prepaid expenses and other assets	87,666	226,809	82,731	(67,506)	329,700
Pledges receivable, net	1,321,168	84,535	146,376	(33,593)	1,518,486
Student loans receivable, net	60,336	—	—	—	60,336
Faculty and staff mortgages and other loans receivable, net	712,161	—	—	—	712,161
Investments at fair value, including securities pledged or on loan of $75,499	34,517,436	2,301,934	957,069	7,153	37,783,592
Plant facilities, net of accumulated depreciation	6,507,537	3,279,048	1,891,701	—	11,678,286
Works of art and special collections	—	—	—	—	—
TOTAL ASSETS	**$ 44,036,785**	**$ 7,214,849**	**$ 3,709,986**	**$ (215,318)**	**$ 54,746,302**
LIABILITIES AND NET ASSETS					
LIABILITIES:					
Accounts payable and accrued expenses	$ 933,291	$ 1,138,577	$ 371,324	$ (151,515)	$ 2,291,677
Accrued pension and postretirement benefit obligations	518,553	66,796	19,243	—	604,592
Liabilities associated with investments	708,629	—	—	—	708,629
Deferred income and other obligations	1,118,899	93,620	—	—	1,212,519
Notes and bonds payable	3,834,297	1,954,672	872,675	—	6,661,644
U.S. government refundable loan funds	39,678	—	—	—	39,678
TOTAL LIABILITIES	**7,153,347**	**3,253,665**	**1,263,242**	**(151,515)**	**11,518,739**
NET ASSETS:					
Without donor restrictions, including non-controlling interest attributable to SHC of $63,803	20,477,405	3,304,125	1,873,422	(63,803)	25,591,149
With donor restrictions	16,406,033	657,059	573,322	—	17,636,414
TOTAL NET ASSETS	**36,883,438**	**3,961,184**	**2,446,744**	**(63,803)**	**43,227,563**
TOTAL LIABILITIES AND NET ASSETS	**$ 44,036,785**	**$ 7,214,849**	**$ 3,709,986**	**$ (215,318)**	**$ 54,746,302**

CONSOLIDATING STATEMENTS OF ACTIVITIES

For the year ended August 31, 2019 (in thousands of dollars)

	UNIVERSITY	SHC	LPCH	ELIMINATIONS	CONSOLIDATED
NET ASSETS WITHOUT DONOR RESTRICTIONS					
OPERATING REVENUES:					
TOTAL STUDENT INCOME, NET	**$ 652,853**	**$ —**	**$ —**	**$ —**	**$ 652,853**
Sponsored support:					
Direct costs - University	850,779	—	—	—	850,779
Direct costs - SLAC National Accelerator Laboratory	545,359	—	—	—	545,359
Indirect costs	286,782	—	—	—	286,782
TOTAL SPONSORED SUPPORT	**1,682,920**	**—**	**—**	**—**	**1,682,920**
Health care services:					
Net patient service revenue	—	5,113,052	1,837,761	(38,375)	6,912,438
Premium revenue	—	106,130	—	—	106,130
Physicians' services and support - SHC and LPCH, net	1,166,935	—	—	(1,166,935)	—
Physicians' services and support - other facilities, net	43,286	—	—	(11,182)	32,104
TOTAL HEALTH CARE SERVICES	**1,210,221**	**5,219,182**	**1,837,761**	**(1,216,492)**	**7,050,672**
TOTAL CURRENT YEAR GIFTS IN SUPPORT OF OPERATIONS	**251,491**	**244**	**4,678**	**—**	**256,413**
Net assets released from restrictions:					
Payments received on pledges	149,950	3,528	—	—	153,478
Prior year gifts released from donor restrictions	62,140	6,954	6,758	—	75,852
TOTAL NET ASSETS RELEASED FROM RESTRICTIONS	**212,090**	**10,482**	**6,758**	**—**	**229,330**
Investment income distributed for operations:					
Endowment	1,303,035	361	15,774	—	1,319,170
Expendable funds pools and other investment income	261,665	1,976	—	—	263,641
TOTAL INVESTMENT INCOME DISTRIBUTED FOR OPERATIONS	**1,564,700**	**2,337**	**15,774**	**—**	**1,582,811**
TOTAL SPECIAL PROGRAM FEES AND OTHER INCOME	**554,777**	**157,757**	**94,487**	**—**	**807,021**
TOTAL OPERATING REVENUES	**6,129,052**	**5,390,002**	**1,959,458**	**(1,216,492)**	**12,262,020**
OPERATING EXPENSES:					
Salaries and benefits	3,768,195	2,302,399	821,816	—	6,892,410
Depreciation	398,054	190,136	112,973	—	701,163
Other operating expenses	1,801,818	2,514,180	946,405	(1,216,492)	4,045,911
TOTAL OPERATING EXPENSES	**5,968,067**	**5,006,715**	**1,881,194**	**(1,216,492)**	**11,639,484**
CHANGE IN NET ASSETS FROM OPERATING ACTIVITIES	**$ 160,985**	**$ 383,287**	**$ 78,264**	**$ —**	**$ 622,536**

CONSOLIDATING STATEMENTS OF ACTIVITIES, Continued

For the year ended August 31, 2019 (in thousands of dollars)

	UNIVERSITY	SHC	LPCH	ELIMINATIONS	CONSOLIDATED
NET ASSETS WITHOUT DONOR RESTRICTIONS (continued)					
CHANGE IN NET ASSETS FROM OPERATING ACTIVITIES	**$ 160,985**	**$ 383,287**	**$ 78,264**	**$ —**	**$ 622,536**
NON-OPERATING ACTIVITIES:					
Increase in reinvested gains	1,040,312	150,792	31,169	—	1,222,273
Donor advised funds, net	8,518	—	—	—	8,518
Current year gifts not included in operations	3,251	—	—	—	3,251
Equity and fund transfers, net	151,774	(121,262)	(30,512)	—	—
Capital and other gifts released from restrictions	91,294	977	2,664	—	94,935
Pension and other postemployment benefit related changes other than net periodic benefit expense	(145,191)	(26,422)	(6,636)	—	(178,249)
Transfer to net assets with donor restrictions, net	(117,765)	—	—	—	(117,765)
Swap interest and change in value of swap agreements	(22,599)	(146,794)	—	—	(169,393)
Non-controlling interest attributable to SHC	16,509	—	—	(16,509)	—
Other	(11,438)	1,172	(1,298)	—	(11,564)
NET CHANGE IN NET ASSETS WITHOUT DONOR RESTRICTIONS	**1,175,650**	**241,750**	**73,651**	**(16,509)**	**1,474,542**
NET ASSETS WITH DONOR RESTRICTIONS					
Gifts and pledges, net	525,580	31,079	33,760	—	590,419
Increase in reinvested gains	90,562	2,991	20,700	—	114,253
Change in value of split-interest agreements, net	3,802	—	25	—	3,827
Net assets released to operations	(212,089)	(13,063)	(27,210)	—	(252,362)
Capital and other gifts released to net assets without donor restrictions	(91,294)	(977)	(2,664)	—	(94,935)
Gift transfers, net	(980)	857	123	—	—
Transfer from net assets without donor restrictions, net	117,765	—	—	—	117,765
Other	8,205	(1,173)	862	—	7,894
NET CHANGE IN NET ASSETS WITH DONOR RESTRICTIONS	**441,551**	**19,714**	**25,596**	**—**	**486,861**
NET CHANGE IN TOTAL NET ASSETS	**1,617,201**	**261,464**	**99,247**	**(16,509)**	**1,961,403**
Total net assets, beginning of year	36,883,438	3,961,184	2,446,744	(63,803)	43,227,563
TOTAL NET ASSETS, END OF YEAR	**$ 38,500,639**	**$4,222,648**	**$2,545,991**	**$ (80,312)**	**$ 45,188,966**

CONSOLIDATING STATEMENTS OF ACTIVITIES

For the year ended August 31, 2018 (in thousands of dollars)

	UNIVERSITY	SHC	LPCH	ELIMINATIONS	CONSOLIDATED
NET ASSETS WITHOUT DONOR RESTRICTIONS					
OPERATING REVENUES:					
TOTAL STUDENT INCOME, NET	**$ 635,020**	**$ —**	**$ —**	**$ —**	**$ 635,020**
Sponsored support:					
Direct costs - University	801,534	—	—	—	801,534
Direct costs - SLAC National Accelerator Laboratory	580,314	—	—	—	580,314
Indirect costs	273,679	—	—	—	273,679
TOTAL SPONSORED SUPPORT	**1,655,527**	**—**	**—**	**—**	**1,655,527**
Health care services:					
Net patient service revenue	—	4,677,929	1,546,805	(43,344)	6,181,390
Premium revenue	—	92,654	—	—	92,654
Physicians' services and support - SHC and LPCH, net	1,048,749	—	—	(1,048,749)	—
Physicians' services and support - other facilities, net	40,672	—	—	(12,438)	28,234
TOTAL HEALTH CARE SERVICES	**1,089,421**	**4,770,583**	**1,546,805**	**(1,104,531)**	**6,302,278**
TOTAL CURRENT YEAR GIFTS IN SUPPORT OF OPERATIONS	**278,867**	**294**	**3,951**	**—**	**283,112**
Net assets released from restrictions:					
Payments received on pledges	138,704	3,928	—	—	142,632
Prior year gifts released from donor restrictions	51,892	(1,088)	5,139	—	55,943
TOTAL NET ASSETS RELEASED FROM RESTRICTIONS	**190,596**	**2,840**	**5,139**	**—**	**198,575**
Investment income distributed for operations:					
Endowment	1,239,746	382	14,187	—	1,254,315
Expendable funds pools and other investment income	253,642	850	—	—	254,492
TOTAL INVESTMENT INCOME DISTRIBUTED FOR OPERATIONS	**1,493,388**	**1,232**	**14,187**	**—**	**1,508,807**
TOTAL SPECIAL PROGRAM FEES AND OTHER INCOME	**524,675**	**135,597**	**67,804**	**—**	**728,076**
TOTAL OPERATING REVENUES	**5,867,494**	**4,910,546**	**1,637,886**	**(1,104,531)**	**11,311,395**
OPERATING EXPENSES:					
Salaries and benefits	3,495,306	2,091,260	741,925	—	6,328,491
Depreciation	380,142	176,595	99,367	—	656,104
Other operating expenses	1,794,501	2,322,032	842,511	(1,104,531)	3,854,513
TOTAL OPERATING EXPENSES	**5,669,949**	**4,589,887**	**1,683,803**	**(1,104,531)**	**10,839,108**
CHANGE IN NET ASSETS FROM OPERATING ACTIVITIES	**$ 197,545**	**$ 320,659**	**$ (45,917)**	**$ —**	**$ 472,287**

CONSOLIDATING STATEMENTS OF ACTIVITIES, Continued

For the year ended August 31, 2018 (in thousands of dollars)

	UNIVERSITY	SHC	LPCH	ELIMINATIONS	CONSOLIDATED
NET ASSETS WITHOUT DONOR RESTRICTIONS (continued)					
CHANGE IN NET ASSETS FROM OPERATING ACTIVITIES	**$ 197,545**	**$ 320,659**	**$ (45,917)**	**$ —**	**$ 472,287**
NON-OPERATING ACTIVITIES:					
Increase in reinvested gains	951,197	158,592	49,765	—	1,159,554
Donor advised funds, net	(6,489)	—	—	—	(6,489)
Current year gifts not included in operations	3,064	—	—	—	3,064
Equity and fund transfers, net	126,000	(96,157)	(29,843)	—	—
Capital and other gifts released from restrictions	162,511	309	352,979	—	515,799
Pension and other postemployment benefit related changes other than net periodic benefit expense	69,570	28,277	1,997	—	99,844
Transfer to net assets with donor restrictions, net	(114,600)	—	—	—	(114,600)
Swap interest and change in value of swap agreements	8,168	48,043	—	—	56,211
Loss on extinguishment of debt	—	(47,613)	—	—	(47,613)
Non-controlling interest attributable to SHC	18,093	—	—	(18,093)	—
Other	(11,721)	(1,158)	(949)	—	(13,828)
NET CHANGE IN NET ASSETS WITHOUT DONOR RESTRICTIONS	**1,403,338**	**410,952**	**328,032**	**(18,093)**	**2,124,229**
NET ASSETS WITH DONOR RESTRICTIONS					
Gifts and pledges, net	487,523	44,983	42,788	—	575,294
Increase in reinvested gains	521,545	3,179	28,244	—	552,968
Change in value of split-interest agreements, net	23,903	—	212	—	24,115
Net assets released to operations	(190,596)	(4,366)	(23,277)	—	(218,239)
Capital and other gifts released to net assets without donor restrictions	(162,511)	(309)	(352,979)	—	(515,799)
Gift transfers, net	(2,381)	2,177	204	—	—
Transfer from net assets without donor restrictions, net	114,600	—	—	—	114,600
Other	(3,202)	—	(544)	—	(3,746)
NET CHANGE IN NET ASSETS WITH DONOR RESTRICTIONS	**788,881**	**45,664**	**(305,352)**	**—**	**529,193**
NET CHANGE IN TOTAL NET ASSETS	**2,192,219**	**456,616**	**22,680**	**(18,093)**	**2,653,422**
Total net assets, beginning of year	34,691,219	3,504,568	2,424,064	(45,710)	40,574,141
TOTAL NET ASSETS, END OF YEAR	**$ 36,883,438**	**$ 3,961,184**	**$ 2,446,744**	**$ (63,803)**	**$ 43,227,563**

CONSOLIDATING STATEMENTS OF CASH FLOWS

For the year ended August 31, 2019 (in thousands of dollars)

	UNIVERSITY	SHC	LPCH	ELIMINATIONS	CONSOLIDATED
CASH FLOW FROM OPERATING ACTIVITIES					
Change in net assets	$ 1,617,201	$ 261,464	$ 99,247	$ (16,509)	$ 1,961,403
Adjustments to reconcile change in net assets to net cash provided by (used for) operating activities:					
Depreciation	398,054	190,136	112,973	—	701,163
Amortization of bond premiums, discounts and other	(17,782)	(1,258)	40	—	(19,000)
Gains on disposal of plant facilities	(3,820)	—	—	—	(3,820)
Net gains on investments	(2,453,967)	(106,380)	(33,768)	—	(2,594,115)
Change in fair value of interest rate swaps	20,580	134,269	—	—	154,849
Change in split-interest agreements	28,347	—	202	—	28,549
Change in deferred tax asset and liability	15,350	—	—	—	15,350
Investment income for restricted purposes	(13,377)	—	—	—	(13,377)
Gifts restricted for long-term investments	(249,734)	(45,967)	(54,460)	—	(350,161)
Equity and fund transfers, net	(150,794)	120,406	30,388	—	—
Gifts of securities and properties	(28,660)	—	—	—	(28,660)
Other	8,981	—	—	—	8,981
Premiums received from bond issuance	158,169	—	—	—	158,169
Changes in operating assets and liabilities:					
Accounts receivable	52,776	(94,670)	(84,316)	—	(126,210)
Pledges receivable, net	(52,721)	22,139	(23,584)	—	(54,166)
Prepaid expenses and other assets	(18,419)	(57,534)	(5,758)	—	(81,711)
Accounts payable and accrued expenses	66,519	142,501	(17,746)	—	191,274
Accrued pension and postretirement benefit obligations	161,200	26,743	6,778	—	194,721
Deferred income and other obligations	68,294	48,984	38,796	—	156,074
NET CASH PROVIDED BY (USED FOR) OPERATING ACTIVITIES	**(393,803)**	**640,833**	**68,792**	**(16,509)**	**299,313**
CASH FLOW FROM INVESTING ACTIVITIES					
Additions to plant facilities, net	(1,218,342)	(553,642)	(148,341)	—	(1,920,325)
Change in assets limited as to use	(94,897)	(11)	—	—	(94,908)
Student, faculty and other loans:					
New loans made	(142,331)	—	—	—	(142,331)
Principal collected	66,276	—	—	—	66,276
Purchases of investments	(13,423,397)	(594,575)	(18,394)	16,346	(14,020,020)
Sales and maturities of investments	14,731,578	449,165	14,371	—	15,195,114
Sales (purchases) of investments with securities lending collateral, net	57,215	—	—	—	57,215
Change associated with short term investments	375,581	—	—	—	375,581
Swap settlement payments, net	—	(12,595)	—	—	(12,595)
NET CASH PROVIDED BY (USED FOR) INVESTING ACTIVITIES	**351,683**	**(711,658)**	**(152,364)**	**16,346**	**(495,993)**
CASH FLOW FROM FINANCING ACTIVITIES					
Gifts and reinvested income for restricted purposes	299,436	45,952	80,027	—	425,415
Equity and fund transfers from Hospitals	137,348	(107,166)	(30,182)	—	—
Proceeds from borrowing	971,445	—	30,000	—	1,001,445
Repayment of notes and bonds payable	(696,711)	(14,610)	(7,920)	—	(719,241)
Bond issuance costs and interest rate swaps	(2,037)	(98)	—	—	(2,135)
Contributions received for split-interest agreements	27,921	—	—	—	27,921
Payments made under split-interest agreements	(42,989)	—	—	—	(42,989)
Securities lending collateral (sold) received, net	(57,215)	—	—	—	(57,215)
Change in liabilities associated with investments	(11,237)	—	—	—	(11,237)
Other	6,917	—	—	—	6,917
NET CASH PROVIDED BY (USED FOR) FINANCING ACTIVITIES	**632,878**	**(75,922)**	**71,925**	**—**	**628,881**
INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	**590,758**	**(146,747)**	**(11,647)**	**(163)**	**432,201**
Cash and cash equivalents, beginning of year	265,795	652,256	288,469	(7,153)	1,199,367
CASH AND CASH EQUIVALENTS, END OF YEAR	**$ 856,553**	**$ 505,509**	**$ 276,822**	**$ (7,316)**	**$ 1,631,568**
SUPPLEMENTAL DATA:					
Interest paid, net of capitalized interest	$ 119,696	$ 43,602	$ 36,766	$ —	$ 200,064
Cash collateral received under security lending agreements	$ 19,922	$ —	$ —	$ —	$ 19,922
Change in payables for plant facilities	$ (70,706)	$ 48,461	$ (24,890)	$ —	$ (47,135)

CONSOLIDATING STATEMENTS OF CASH FLOWS

For the year ended August 31, 2018 (in thousands of dollars)

	UNIVERSITY	SHC	LPCH	ELIMINATIONS	CONSOLIDATED
CASH FLOW FROM OPERATING ACTIVITIES					
Change in net assets	$ 2,192,219	$ 456,616	$ 22,680	$ (18,093)	$ 2,653,422
Adjustments to reconcile change in net assets to net cash provided by (used for) operating activities:					
Depreciation	380,142	176,595	99,367	—	656,104
Amortization of bond premiums, discounts and other	(14,896)	(3,839)	(2,846)	—	(21,581)
Provision for doubtful accounts for health care services	—	57,437	5,660	—	63,097
Losses on disposal of plant facilities	4,350	—	—	—	4,350
Net gains on investments	(2,683,987)	(123,731)	(38,216)	—	(2,845,934)
Change in fair value of interest rate swaps	(10,654)	(63,439)	—	—	(74,093)
Change in split-interest agreements	44,626	—	353	—	44,979
Investment income for restricted purposes	(12,413)	—	—	—	(12,413)
Gifts restricted for long-term investments	(232,520)	(37,958)	(71,032)	—	(341,510)
Equity and fund transfers, net	(123,619)	93,938	29,681	—	—
Gifts of securities and properties	(31,093)	—	—	—	(31,093)
Loss on extinguishment of debt	—	47,613	—	—	47,613
Other	32,140	1,909	—	—	34,049
Premiums received from bond issuance	—	76,138	—	—	76,138
Changes in operating assets and liabilities:					
Accounts receivable	(9,697)	(82,765)	(6,589)	—	(99,051)
Pledges receivable, net	(31,016)	2,684	13,767	—	(14,565)
Prepaid expenses and other assets	578	(13,877)	(18,095)	—	(31,394)
Accounts payable and accrued expenses	10,345	64,535	66,743	—	141,623
Accrued pension and postretirement benefit obligations	(45,537)	(50,772)	(1,474)	—	(97,783)
Deferred income and other obligations	18,566	93,620	—	—	112,186
NET CASH PROVIDED BY (USED FOR) OPERATING ACTIVITIES	**(512,466)**	**694,704**	**99,999**	**(18,093)**	**264,144**
CASH FLOW FROM INVESTING ACTIVITIES					
Additions to plant facilities, net	(1,133,180)	(474,735)	(271,391)	—	(1,879,306)
Change in assets limited as to use	194,376	58,134	33,096	—	285,606
Student, faculty and other loans:					
New loans made	(121,949)	—	—	—	(121,949)
Principal collected	69,831	—	—	—	69,831
Purchases of investments	(12,054,658)	(605,959)	(12,502)	17,987	(12,655,132)
Sales and maturities of investments	13,095,901	47,262	14,570	—	13,157,733
Sales (purchases) of investments with securities lending collateral, net	271,647	—	—	—	271,647
Change associated with short term investments	246,599	—	—	—	246,599
Swap settlement payments, net	—	(15,393)	—	—	(15,393)
NET CASH PROVIDED BY (USED FOR) INVESTING ACTIVITIES	**568,567**	**(990,691)**	**(236,227)**	**17,987**	**(640,364)**
CASH FLOW FROM FINANCING ACTIVITIES					
Gifts and reinvested income for restricted purposes	297,548	40,747	53,658	—	391,953
Equity and fund transfers from Hospitals	100,718	(70,875)	(29,843)	—	—
Proceeds from borrowing	293,471	954,200	—	—	1,247,671
Repayment of notes and bonds payable	(398,371)	(679,331)	(5,801)	—	(1,083,503)
Bond issuance costs and interest rate swaps	—	(6,783)	—	—	(6,783)
Contributions received for split-interest agreements	29,561	—	—	—	29,561
Payments made under split-interest agreements	(42,630)	—	—	—	(42,630)
Securities lending collateral (sold) received, net	(271,647)	—	—	—	(271,647)
Change in liabilities associated with investments	(71,322)	—	—	—	(71,322)
Other	11,993	176	—	—	12,169
NET CASH PROVIDED BY (USED FOR) FINANCING ACTIVITIE	**(50,679)**	**238,134**	**18,014**	**—**	**205,469**
INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	**5,422**	**(57,853)**	**(118,214)**	**(106)**	**(170,751)**
Cash and cash equivalents, beginning of year	260,373	710,109	406,683	(7,047)	1,370,118
CASH AND CASH EQUIVALENTS, END OF YEAR	**$ 265,795**	**$ 652,256**	**$ 288,469**	**$ (7,153)**	**$ 1,199,367**
SUPPLEMENTAL DATA:					
Interest paid, net of capitalized interest	$ 154,654	$ 33,033	$ 14,750	$ —	$ 202,437
Cash collateral received under security lending agreements	$ 77,137	$ —	$ —	$ —	$ 77,137
Change in payables for plant facilities	$ 75,031	$ 111,562	$ 10,615	$ —	$ 197,208

Schedule of Expenditures of Federal Awards
Part A, Award Expenditure Detail

STANFORD UNIVERSITY
SCHEDULE OF EXPENDITURES OF FEDERAL AWARDS PART A
AWARD EXPENDITURE DETAIL
Year Ended 8/31/2019

Federal Grantor/Federal Program Title	Federal CFDA Number	Pass-Through Entity Name	Pass-Through Entity Identifying Number	Amount Passed through to Sub-Recipients	Total Federal Expenditures
Corporation for National and Community Service					**$582,919**
Social Innovation Fund Administrative Data Pilot	94.024				$582,919
Department of Agriculture					**$242,777**
Assessing cover crop as an adaptation to improve climate resilience of the US Midwest agro-ecosystems: integrating biophysical modeling, data science, and crop insurance analyses	10.310	University of Illinois at Urbana Champaign	09211-17062		$13,680
Circulating Tumor DNA (ctDNA) and liver cancer - Building capacity for future molecular research and cancer prevention in Mongolia	10.001	CRDF Global	DAA2-17-63002-1		$3
Evaluation of Save the Children's PALAM/A project in Sri Lanka	10.RD	American Institutes for Research	D473100002		$3,598
Investigating tomato immune signaling pathways through the study of the Xanthomonas T3S effector target Tomato Atypical Receptor Kinase 1	10.310				$44,463
Predicting the resilience of carbon sequestration and productivity of forests and grasslands to changes in fire	10.310				$105,793
Predicting the response of soil carbon stocks to changes in plant inputs across spatiotemporal scales	10.310				$75,240
Department of Commerce					**$907,464**
A Risk-based Approach to Interpreting Fecal Source-associated Microbial Source Tracking (MST) Marker Concentrations (California Sea Grant Omnibus 2014-2018, Years 1-4)	11.417	University of San Diego	84414221		$4,933
Biosphere-atmosphere regulations of droughts assessed using microwave and solar-induced fluorescence observations and improved plant water stress representation	11.431	Columbia University	1(GG008692)		$9,150
Data Driven Predictive Models for Smart Manufacturing	11.609				$79,232
Foundational Grant of the Joint Initiative for Metrology in Biology (JIMB)	11.620				$303,111
Improving Estimates of Natural Mortality of Atlantic Bluefin Tuna with Electronic Tags	11.472	The Ocean Foundation	138979		$64,683
JIMB Shared Research Facility	11.609				$43,445
Reliably Inferring the Sun's Far-Side Magnetic Flux for Operations Using Time-Distance Helioseismic Imaging	11.468				$199,403
Seismic Assessment, Retrofit Strategies and Policy Implications for Vulnerable Existing Steel Buildings	11.609				$133,550
Stanford NIST JIMB Training Grant	11.620				$69,957
Department of Defense (DOD)					**$69,575,567**
"Quantum Metaphotonics and Metamaterials: from Single Emitters to Strongly Correlated Systems"	12.800	Brown University	FA-99550-12-1-0488 00000556		($3,763)
(MURI 15) ATOMICALLY-THIN SYSTEMS THAT UNFOLD, INTERACT AND COMMUNICATE AT THE CELLULAR SCALE	12.800	Cornell University	76123-10600		$376,221
10.2.3 Social Network Analysis: Brain predictors of social network structure and function	12.431			$3,673	$304,372
A basic research pipeline for discovery and early preclinical development of host-targeted antiviral strategies to combat encephalitic alphaviruses	12.351			$114,434	$560,355
A General and Ultra-high-performance Platform for Nonlinear Photonics	12.910				$23,536
A Modeling-Based Personalized Screening Strategy Combining Circulating Biomarker and Imaging Data for Breast Cancer Early Detection	12.RD				$148,265
A multiscale nested modeling framework to simulate the interaction of surface gravity waves with nonlinear internal gravity waves	12.300				$43,351
A Nested Mixed-Methods Approach to Armed Non-State Actor Governance and the Rule of Law	12.630	George Mason University	E204334-1		$22,152
A proposal to study the effect of unsteady wall boundary conditions on turbulent boundary layers	12.RD				$71,256
A Prosthetic Foot Emulator to Optimize Prescription of Prosthetic Feet in Veterans and Service Members with Leg Amputations	12.420	Seattle Institute for Biomedical and Clinical Research (SIBCR)	MD13-STAN-2		$16,290
A Rapid Blood Test to Differentiate Latent Tuberculosis from Active Disease	12.420	University of California, San Diego	113394183 PO S9002292		$101,466
Accelerating knowledge extraction from large-scale multi-data sources by incorporating prior knowledge with deep learning	12.910			$19,881	$80,605
Accountable Protocol Customization	12.300				$26,680
Acoustic Power and Data Links for Deep Tissue Wireless Implants	12.910				$58,331
Active Metasurfaces for Advanced Wavefront Engineering and Waveguiding	12.800	Harvard University	123885-5079400		$264,691
Advanced multi-length characterization of inherently safe lithium-ion battery	12.300				$125,594
Advanced Ship-handling Simulators	12.RD	Charles River Analytics Inc.	SC1800101		$35,850
Advanced state of charge determination in phase-separating electrodes for battery cells and in individual particles	12.300				$194,914
AFOSR: Equipment for a dysprosium multimode cavity QED science chamber and pump laser	12.800				$44,513
AI for Education: Designing Conversational Teaching Agents	12.300				$202,586
AI Nets: Predicting Actions and Inferring Intentions of Groups of Targets with a Network of Surveillance Robots	12.300			$1,017	$121,174
ALD/Encapsulated Thermal Accelerometer	12.910				$459,857
Alloantibodies in the Treatment of Breast Cancer	12.420				$104,036
Amortized Inference for Probabilistic Programs	12.300			$280,295	$287,889
Anti-Lysophosphatidic acid antibodies in the treatment of post-TBI neuropathic pain	12.RD				$192,407
Aperiodic Silicon Photonics: Inverse Design, Fast Algorithms, and Fundamental Aspects	12.800				$28,465
Architecture and Analysis for High-Assurance Autonomy	12.RD	Rockwell Collins	PO-4506642848		$518,980
Army High Performance Computing Research Center	12.RD			($20,042)	$541,211
Artificial-intelligence aided findings detection models for diagnostic imaging in Prostate Cancer	12.420				$141,517
Assessment and Scaffolding for Learners of Complex, Dynamic Domain Knowledge: With Application to Ship Handling	12.300				$286,748
Atypical Opioid Mechanisms of Control of Injury-Induced Cutaneous Pain by Delta Receptors	12.420				$128,875
Avian-Inspired Multifunctional Morphing Vehicles	12.800	University of Michigan	3003832414		$206,921
Basic principles of optical read-write manipulations of sensory cortex and perception	12.910				$180,747
Basic Single-Event and Total-Ionizing Dose Mechanisms in Ge/InGaAs-based CMOS Transistors with ALD High-k Dielectric	12.351			$22,824	$24,563
Better Reinforcement Learning with Online Representation Discovery and Sample Efficient Learning	12.300				$232,978
BHMC Building Healthy Military Communities	12.750	Henry M Jackson Foundation for the Advancement of Military Medicine	3352 / PO 886051		$39,596

STANFORD UNIVERSITY
SCHEDULE OF EXPENDITURES OF FEDERAL AWARDS PART A
AWARD EXPENDITURE DETAIL
Year Ended 8/31/2019

Federal Grantor/Federal Program Title	Federal CFDA Number	Pass-Through Entity Name	Pass-Through Entity Identifying Number	Amount Passed through to Sub-Recipients	Total Federal Expenditures
BIGMAPS: Brain Imaging for Global Motifs of Activity Pattern and Structure NeuroFAST	12.910			$109,002	$1,508,387
Binder-Finder through Machine-Learning (BFML)	12.910				$38,897
Biofidelic 3-Dimensional Brain Surrogate Models of mTBI-Induced Alzheimer's Disease Pathology	12.420			$14,732	$14,395
Biological Cartography of Threat Space (BIOCATS)	12.RD	SRI International	PO17395		$59,749
Biomechanical and energetic analyses of whale-borne tag sensor data to assess the population consequences of acoustic disturbance	12.300				$96,513
Biometric Stem Cell Dressing for Skin Regeneration	12.420	Wake Forest University	WFUHS 441013 SR-03		$15,692
Biomimetic organic electronic transistors for characterizing host cell-pathogen interactions	12.431			$343,148	$499,143
Brain strain and neck muscle dynamics during sagittal head impacts in naval scenarios	12.300				$186,476
Brain Trauma Evidence-based Consortium (B-TEC)	12.RD			$250,947	$766,377
Catalytic Synthesis of Shape-Persistent Ladder Polymers and Control of Their Intrinsic Microporosity	12.431				$28,510
Cellular and Molecular Characterization of ER + Breast Cancer	12.420				($423,126)
Center for Advanced Organic Photovoltaics	12.300	Georgia Institute of Technology	AWD-100927-G2 / PO-5006745		$96,759
Center for Distributed Quantum Information (CDQI)	12.431	University of Maryland	48635-Z8401006		$111,190
Center for Turbulence Research (CTR) Summer Program	12.800				$11,844
Center for Turbulence Research Summer Program	12.300				$11,041
Characterizing Dusty Plasmas Formed by Hypervelocity Impacts Through Experiments and Particle-In-Cell (PIC) Simulations	12.800				$221,713
Chemistry with Microdroplets	12.800				$61,461
Circuit Integration for Robust Quantum Information Technology Scalability (CIRQuITS)	12.RD	Vector Atomic	VAS-18-0002/W911NF19P0006		$49,812
Coherent Control of Molecular Scattering Using Stark-Induced Adiabatic Raman Passage	12.431				$215,831
Collaborative Decision Making at Scale: Bridging Theory and Practice	12.300				$26,971
Comparing hospital hand hygiene in Liberia: soap, alcohol, and hypochlorite	12.750	Henry M Jackson Foundation for the Advancement of Military Medicine	4058 // PO 927761		$134,746
Complex Event Recognition from Open Source Social Media (CEROSS)	12.RD	SRI International	PO8873		$22,639
Computational Methods for Air Traffic Modelling in Terminal Airspace	12.RD	MIT-Lincoln Laboratory (DOD)	7000406644		$58,656
Corticospinal neuron transplantation to repair chronic cervical spinal cord injury	12.420				$231,103
Data Geometry, Semantics, and Information	12.300				$352,508
Decentralized Tactical Modular Teaming for Real-World UAS Networks	12.910				$218,926
Deep Models of Compositionality and Context	12.431				$902,424
Defining the role and therapeutic potential of Notch signaling in aggressive prostate cancer	12.420				$167,638
Depth Insensitive Pressure/Vector Sensor Arrays	12.RD	Intelligent Fiber Optic Systems Corporation	SBIR Phase II		$63,560
Design of Optimal Loss Functions for Statistical Estimation	12.300				$138,440
Developing Methods of Control of Self-Organized Plasma Structures in Devices Relevant to Electric Propulsion	12.800	Princeton University	SUB0000171		$63,088
Developing New Simulation Models for Machine Learning	12.300				$70,733
Development and preclinical validation of an improved tissue engineered vascular graft for use in congenial heart surgery	12.420	The Research Institute at Nationwide Children's Hospital	710049-0921-00/PO4602317-0-46		$79,525
Development of a Rapidly-acting Preventative Therapy for Influenza	12.RD	DNARx	HR0011940279		$229,812
Development of a Rapidly-acting Preventive Therapy for Influenza	12.RD	DNARx	HR0011940279		$130,724
Development of HyChem - A Jet and Rocket Fuel Combustion Chemistry Model	12.800				$619,773
Development of Targeted, Immune-Based Immunosuppression for Composite Tissue Transplantation	12.420				$2,998
Differential Resonant Beam Accelerometer Phase 4	12.910				$800,114
Dimension reduction for open quantum systems	12.431				$144,392
Dimensional Reduction of Highly Nonlinear Multiscale Models Using Most Appropriate Local Reduced-Order Bases	12.800				$316,960
Dissecting the causal role of neural dynamics in supporting computation and behavior	12.300				$83,027
Distinguishing Benign from Malignant Breast Lesions: Does Breast Interstitial Fluid Hold the Answers?	12.420				$66,508
Distributed Robust Data-Driven Control and Optimization	12.910	University of California, San Diego	101513612,S9001951		$84,767
DNA origami scaffolds for single-particle cryo-Electron Microscopy of viral RNA	12.300	Massachusetts Institute of Technology	62284		$80,871
Doing more with Less: Accelerating the Analyst from Modeling down to the Hardware	12.910				$745,706
Dual PET/Fluorescence Imaging of Glioma with an MMP-14 Activabable Peptide Probe	12.420	University of Alabama	000518502-001		$99,271
Earth Materials and Processes: Scale Dependence of Governing Laws in Earth Materials	12.431				$87,325
Efficacy of Repetitive Transcranial Magnetic Stimulation for Improvement of Memory in Older Adults with TBI Problems in Complex TBI	12.420	Palo Alto Veterans Institute for Research	ADA0007-01; PO# ADA074575		$22,061
Embedded Humans: Provably Correct Decision Making for Networks of Humans and Unmanned Systems	12.300	University of California, Berkeley	PO: BB01078656 SA 8173		$65,663
Energy-Efficient Nanophotonic Neuromorphic Computing	12.800	University of California, Davis	A18-0583-S001		$196,785
Engineering a plant chassis for rapid and scalable production of small molecule therapeutics	12.910				$190,846
Engineering diamond quantum optical systems for quantum computing and simulations	12.431				$189,823
Engineering Functionality in Emergent Oxide Thin Film Materials Systems	12.300				$679,604
Engineering light-mediated interactions in dysprosium for quantum many-body physics	12.800				$237,911
Engineering the translation apparatus for synthesis of electronically active sequence-defined polymers	12.431	Northwestern University	60044193 STAN		$83,995
Enhancing Mechanical and Combustion Properties of Boron/Polymer Composites via Engineered Interfacial Chemistry	12.300				$181,649
Enhancing the resolution, sensitivity, and bandwidth of a quantum sensor for imaging technologically relevant materials	12.300				$169,113

STANFORD UNIVERSITY
SCHEDULE OF EXPENDITURES OF FEDERAL AWARDS PART A
AWARD EXPENDITURE DETAIL
Year Ended 8/31/2019

Federal Grantor/Federal Program Title	Federal CFDA Number	Pass-Through Entity Name	Pass-Through Entity Identifying Number	Amount Passed through to Sub-Recipients	Total Federal Expenditures
Enhancing Vascularized Composite Allograft Survival with miR-181a-Expressing Liver Plasmacytoid Dendritic Cells	12.420				($221)
Epidemiologic Study of SCT and Risk Factors for Exertional Injuries	12.750	Henry M Jackson Foundation for the Advancement of Military Medicine	Subaward 2549 PO # 827119		$240,293
Epigenome editing and reactivation of X-linked FOXP3 for treating breast cancers	12.420				$183,842
ERGO: Exploiting Risk-taking in Group Operations	12.RD	MIT-Lincoln Laboratory (DOD)	P.O. 7000443045		$23,737
Establishing the Operational Capacity of the Animal Telemetry Network Data Assembly Center	12.300				($96)
Experimental and Theoretical Design of Multi-Tasking Catalysts: New Routes for the Synthesis of Precision Polymeric Materials	12.300			$155,541	$188,085
Experimental characterization of 2D exciton coherence area for MoSe2	12.431				$11,993
Experiments Investigating Resilience	12.RD			$159,799	$1,673,813
Exploring solid-state high-harmonic generation as a potential attosecond source for materials characterization	12.800				($216)
Extracting Information from Rich Video Streams: An Agile Software/Hardware Approach	12.901				$1,568,169
EXtreme Electron Concentration Oxide DEvices (EXEDE)	12.300	University of California, Santa Barbara	KK1318		($129)
Formation and Dynamics of Peer Groups in Online Learning Environments	12.300				$178,639
Fundamental Aspects of NO IR Spectroscopy in High T and P Air	12.800				$123,198
Fundamental Understanding and Modeling of Multi-Phase Flows at Transcritical Conditions	12.431				$1,384
Fusion genes predict prostate cancer recurrence	12.420				$187,588
Ga-68 Bombesin PET/MRI in patients with biochemically recurrent prostate cancer and non-contributory conventional imaging	12.420				$394,016
Game-theoretic mechanisms for group decision making	12.300				$44,357
Getting More from Less: Optimal Estimation and Learning, For Sparse, High Dimensional, or Untrusted Data	12.300				$114,428
Global stability and sensitivity analysis of a hypersonic slender cone	12.300				$355,231
Gravitational sensors based on atom interferometry	12.351				$194,812
Hardware-Up Security: Anti-fragility and Automation	12.RD	Columbia University	1(GG008732)		$129,418
HERMES: Hybrid Efficient Reasoning Methods for Explainable and Scalable formal methods	12.RD	United Technologies Research Center	1239372 1195604-1-GWMTW		$257,344
High Magnitude Field STM System for Studies of Topological Insulators and Related Systems	12.431				$669
High Performance Roll-to-Roll Coated All-Polymer Solar Cells	12.300				$318,901
High¿Speed Air Breathing Propulsion and Structural Interactions Research	12.RD	Universal Technology Corporation	187900001103C1;FA86 5014D2411		$231,442
High-Assurance Cryptography	12.300			$593,267	$814,434
High-Expressivity World Modeling	12.RD	SRI International	PO20681		$272,235
High-fidelity Simulations and Predictive Modeling of Jet Screech.	12.300				$209,565
High-Fidelity Verification and Validation of Spaceborne Vision-Based Navigation Systems	12.800				$393,508
High-Order Methods and High Fidelity Simulation of Unsteady Turbulent Fluid Flows	12.800			$58,103	$72,853
High-Performance and Reliable Automated Carrier Landing via CFD-Based Model Predictive Control	12.300				$241,904
High-Speed DACs for Digital Arrays in Digital Process Technology	12.910				$213,038
Homo SocioNeticus: Scaling the cognitive foundations of online social behavior	12.RD	Virginia Polytechnic and State University	450522-19751		$90,380
Human Intent Aware Decision- Making Planning	12.RD	MIT-Lincoln Laboratory (DOD)	7000441073		$67,759
Human-Centered Design and Control of Vine Robots for Disaster Scenarios	12.630				$200,996
Hybrid Aluminum and Porous Si as High Performance Energetic Materials	12.300				$16,033
Hybrid-Materials Valley Optoelectronics for Photon Spin Communication	12.800	Cornell University	FA9550-18-1-0480		$143,610
Identify and target innate immune checkpoints to treat metastatic breast cancer	12.420				$386,187
Identifying mechanisms of degradation in perovskite solar cells and improving their stability	12.300				$100,217
Immune Responses Associated with Acute Pancreatitis	12.420				$714,044
Improving RANS for 3D Flows Using Machine Learning and Model Interpretation	12.300				$68,369
Information-Geometric Approach for Data-Driven Multiscale Simulations	12.800				$212,061
iNGOT: The Next Generation of Obfuscation Techniques	12.RD			$43,256	$396,008
Interactive data analysis with statistical guarantees	12.431				($2,342)
INTERCEPT: Interfering and Co-evolving Prevention and Therapy	12.910	University of California, San Francisco	9994sc		$581,827
Internal Cooling of Fiber, and Disc lasers by Radiation Balancing and other Optical or Phonon Processed	12.800	University of Illinois at Urbana Champaign	084272-16070		$271,565
Investigating Epigenomic Reprogramming in Human Melanoma Development	12.420				$89,817
Investigation of Deep Learning for Solid and Fluid Simulations	12.300				$37,943
IQGAP1 Scaffold-Kinase Interaction Blockade In Renal Cell Carcinoma: A Novel Biomarker And Therapeutic Strategy	12.420			$29,546	$247,242
JTO MRI: Power Scalable Electrically Driven Monolithic IR Surface Emitting Semiconductor Lasers	12.300	University of Texas at Arlington	126060159062		$176,027
Just-in-Time, Single-Dose, Universal Anti-Influenza A Virus Therapeutic	12.420				$250,934
Kinetics Studies of ARO-Relevant Fuels using Shock Tube/Laser Absorption Methods	12.431				$127,298
L2K2R2: Learn to Read to Know, Know to Learn to Read	12.431	University of Southern California	54041521		$60,392
Ladderene-Based Polymechanophores: From Understanding Mechanotransduction to Developing Materials with Amplified Force-Response	12.431				$269,822
Laser propagation in heterogeneous media and applications to off-axis reconstructions	12.300				$111,842
Laser system for precision atom interferometry/Kasevich	12.RD				$206,896
Learning with domain knowledge: an implicit probabilistic models approach	12.300				$22,212
Leverage of Molecular and Macromolecular Architectures for Mechanically Responsive Materials	12.431				$49,746
Low-Density Hyper-Confined Molecular Hybrids: Multifunctional Design and Mechanical Behavior	12.800				$216,429
Machine Learning in Wireless System Design	12.300				$113,345

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Macroscopic Properties and Microscopic Interactions in Insect Swarms	12.431				$100,939
Magnet-Free Non-Reciprocal Metamaterials Based on Spatio-Temporal Modulation	12.800	Research Foundation, The City University of New York	CM00001531-00		$391,890
Mathematical Foundations of Secure Computing Clouds	12.800	University of Wisconsin-Madison	580K753		$7,011
Measuring heart rate to assess the stress response in large whales	12.RD				$90,458
Methods for Large-Scale Distributed Decision-Making	12.300				$696
MINER: Multimodal Networks-A General Representational Language Applied to Bio-Medical Hypothesis Generation and Validation	12.RD			$59,098	$121,832
Mode sorting receivers for super-resolution imaging	12.910	University of Arizona	PO 431649		$48,741
Model down-scaling to study flow over abrupt topography: Nesting a new unstructured-grid, isopycnal-coordinate model based on SUNTANS into the hybrid-coordinate HYCOM model	12.300				$186,215
Models and algorithms for higher order network inference	12.431				$78,570
Modular Representations and Coordination for Lifelong Learning	12.910				$257,001
Molecular Control of Optic Nerve Regeneration	12.420	Boston Children's Hospital	GENFD0001395168		$127,169
Molecular imaging of human performance biomarkers at cellular resolution in vivo	12.800				$26,344
Molecular Iodine Based Green Optical Frequency Standard	12.910			$138,448	$359,052
Molecular Mechanisms of Microbial Uptake of Extracellular Electrons	12.300				$106,479
Monitoring the activity of 1 million individual neurons in awake behaving mammals	12.RD				$338,781
MOP: Making Code Obfuscation Practical	12.RD	International Business Machines Corporation	4915012805 / PO 5005105767		$48,467
Multicenter Randomized Trial of Everolimus in Pediatric Heart Transplantation	12.420	Boston Children's Hospital	GENFD0001531682		$38,864
Multicenter Randomized Trial of Everolimus in Pediatric Heart Transplantation - CCC	12.420	Boston Children's Hospital	GENFD0001336034 GENFD0001531886		$198,652
Multifunctional Composite Materials with Built-in Structural Health Monitoring and Energy-storage Capabilities	12.431				$263,828
Multifunctional dielectric metasurface for coding/decoding and sensing of light	12.800				$181,191
Multifunctional Glass for Augmented Reality	12.910	Columbia University	2(GG012649-07)		$109,415
Multi-functional Metafilms for Augmented Reality	12.800				$173,021
Multiscale, group covariant neural networks for learning physics	12.RD	University of Chicago	FP070960-01-PR		$74,909
MURI Center for Dynamic Magneto-Optics (DYNAMO)	12.800	University of Michigan	3003828617		$123,824
Myriad: Automatic Software Diversity for Execution-Time Protection	12.RD	GrammaTech, Inc.	GT S17-01		$54,460
N3 CENTAUR	12.RD	Palo Alto Research Center	P314996		$360,640
Natural language Engagement of Malicious Entities through a Social Interaction Service (NEMESIS)	12.RD	SRI International	PO29225		$102,782
Near-Field Radiative Heat Transfer and Energy Conversion in Nanogaps of Nano- and Meta-Structured Materials	12.431	University of Michigan	SUBK00010159 / PO 3005531165		$28,982
NEPTUNE: Stanford University Hacking for Defense	12.300			$206,019	$1,196,840
Neuromorphics: Programmable analog computation through probabilistic digital communication	12.300			$362,516	$640,817
Next generation near infrared interference coatings with ultra-low stress and losses for deformable mirror applications	12.300	Colorado State University	G-01705-01		$212,334
Noise-resilient Inertial Sensing Using Group II Atom Interferometry	12.300				$290,776
Non-Cardiomyocyte MicroRNAs Mediate Susceptibility to Right Heart Failure	12.420			$30,987	$645,352
Non-reciprocal photonic gauge potential and non-equilibrium thermal metaphotonics for the control of light and heat	12.300				$479,136
Novel Strategies to Combat Post-Traumatic Osteoarthritis (PTOA)	12.420	Palo Alto Veterans Institute for Research	CHU0018-03		$468,084
One- or Two-Laser Yb Optical Atomic Clock	12.300				$170,964
Optical Diagnostics for High Temperature Air	12.800				$50,698
Optimizing Confocal Line-of-sight and Non-Line-of-sight Imaging	12.300	University of Wisconsin-Madison	831K751		$281,173
Optimizing hip, knee and ankle exoskeleton assistance during walking and running at various speeds, grades and loads	12.RD			$173,935	$647,872
Optimizing human neuronal cultures for analysis and model development	12.RD	Lawrence Livermore National Laboratory	B622176		$192,993
Optimizing Range and Velocity Sensing with Computational Single-photon Imaging	12.431				$96,754
Pathogen Classification Tool (PaCT)	12.RD	Stottler Henke Associates, Inc.	PACT_StottlerHenke-Stanford Un		$17,667
PC1.0-011-FP - Manufacturing of Distributed, Flexible and Stretchable Asset Monitoring Networks	12.RD	United Technologies Research Center	PSA 1230799/PO 2605542		$182,717
PCP@Xtreme 4 Predictive Chemistry & Physics at Extreme Temperature and Pressure molecules,crystals and microstructures	12.300	Purdue University	4104-74508		$251,024
PECASE W911NF-12-R-0012-04: Answering High-Level Questions on Low-Level Data	12.431				$84,760
PECASE: New material and design approaches for integrated nano-optical systems	12.800				$166,858
PECASE: Parity-Time Symmetric Nanophotonic Materials and Metamaterials	12.800				$31,870
Perovskite-Perovskite Tandems for > 25%-Efficient Flexible PV Devices	12.300				$10,134
Photoacoustic Airborne Sonar for Non-Contact Detection Under Water	12.300				$152,186
Photomechanical Material Systems: From Molecules to Devices	12.300	University of Massachusetts Amherst	18-010467 D 00		$193,267
Physical Properties of Materials: Phonon Localization via Defect Engineering in Low-Dimensional Boron Nitride	12.431				$1,140
Physical understanding and predictive modeling of high Reynolds number non-equilibrium turbulent boundary layers	12.300			$28,749	$295,829
Plasma-Based Reconfigurable Photonic Crystals and Metamaterials	12.800			$956,084	$1,443,100
Plasticine: A Universal Data Analytics Accelerator	12.901				$1,167,306
Polymorphism in Layered Materials	12.431				($2,923)
Practical Optimality Guarantees in Estimation and Learning	12.300				$88,300
Precision Measurements of Transverse Transport Coefficients by Torque Magnetometry	12.431			$135,946	$407,657
Preclinical testing of FLASH radiotherapy and immune checkpoint blockade combination therapy in ovarian cancer	12.420				$194,187
Predicting and Understanding Patient Responses to Topoll Isomerase Inhibitors in Breast Cancer	12.420				$83,204

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Predicting and Understanding Responses to TopoII inhibitors in Breast Cancer	12.420				$117,493
Preparation of highly vibrationally excited (v greater than or equal to 4) H2 molecules by Stark induced adiabatic Raman passage (SARP))	12.431				$416,985
Preservation and Restoration of Vision In Optic Neuropathies: Porcine traumatic model for advancing neuroprotective and regenerative therapies towards human testing.	12.RD	Medical Technology Enterprise Consortium	MTEC1802OpticNerve0005	$43,841	$302,807
Prevention of Breast Cancer Skeletal Metastases with Parathyroid Hormone	12.RD				$390,535
Prevention of Sediment Recontamination by Improved BMPs to Remove Organic and Metal Contaminants from Stormwater Runoff	12.RD			$80,977	$435,089
Principles of Avian Musculoskeletal Control for Multifunctional Morphing Vehicle	12.800			$89,449	$254,027
Proactive Decision Making for Autonomous Systems: a Formal Methods Approach	12.300				$86,663
Prospective Multicenter Comparative Effectiveness Study of Post-Traumatic Venous Thromboembolism (CLOTT Study)	12.420	National Trauma Institute	NTI-CLOTT17-10		$104,757
Prototype Tunable Graphene Based Infrared Filter	12.RD	SRI International	16204		$19,724
Provable High Confidence Human Robot Interactions	12.300	University of California, Berkeley	00010041 PO BB01193919		$21,061
Proximity Flight in Perturbed Eccentric Orbits using Relative Orbit Elements	12.RD			$49,509	$136,851
Quantum Control of Cold Collisions Using Stark-Induced Adiabatic Raman Passage	12.431				$26,876
Quantum error correction and spacetime geometry	12.800	Tulane University	TUL-SCC-553955		$230,311
Quantum neuromorphic computing and simulation with multimode cavity QED	12.431				$94,426
Quantum Opto-Mechanics with Atoms and Nanostructured Diamond (QOMAND)	12.300	Harvard University	123950-5092630		$17,619
Quantum Simulation of Frustrated Magnets by Rydberg Dressing	12.431				$109,001
Quantum State Control of Molecular Collision Dynamics	12.431	University of Missouri	C00064278-5		$34,650
Quantum-limited sensing	12.300				$558,752
Random Initiation and Reaction Propagation in Energetic Materials	12.800				$103,888
Rapid-Tuning Infrared Laser System	12.800				$139,217
Reaction Networks and Mechanisms: Discovery and Application in Combustion	12.800			$325,980	$453,802
Real-time control of network physical structures to bypass complexity: Optimization, Stochastics and Structure Recognition	12.910	Columbia University	1(GG014413)		$44,640
Recognizing and describing complex human activities from video sequences	12.431	University of Illinois	2015-05174-01		$73,333
Reference models for multi-layer tissue structures	12.420	Cleveland Clinic Foundation	629-SUB 941-SUB		$163,539
Refugee Psychology and Its Potential for Radicalization	12.431	University of Maryland	70428-Z8105201		$1,166
Research Project in Applied Statistics	12.RD				$114,216
Revolutionizing Computing Systems through Dense and Fine-grained Monolithic 3D Integration	12.RD	Massachusetts Institute of Technology	S4632 / PO #216909		$1,727,567
Rewriting the Rules of Thermal Emission via Parametric Microphotonic Design	12.910	University of Southern California	108725131/PO10724755		$69,722
Role of Tgf Beta and Wnt Signaling in Liver Tissue Homeostasis, Tumorigenesis, and Cancer	12.420				$109,482
Rotation of Optically Levitated Microspheres: Techniques for Enhanced Sensitivity Force Sensing	12.300	Yale University	GR102722 CON-80001233		$279,764
RSK3-mAKAP Targeting as a New Therapeutic Strategy for Heart Failure with Preserved Ejection Fraction in Women	12.420				$226,169
SAGE: Synergistic Anticipation of Geopolitical Events	12.RD	University of Southern California	92302638 112813790		$413,172
Scalable Entanglement for Heisenberg-Limited Clocks and Sensors	12.300				$89,798
Scalable Environment for Quantification of Uncertainty and Optimization in Industrial Applications (SEQUOIA)	12.431			$33,360	$251,704
Scalable Memory-Enhanced Ion-Trap Quantum Network (SciNet)	12.431	University of Innsbruck	Prime Award: W911NF-15-2-0060		$315,788
SCAN: Socio-Cultural Attitudinal Networks	12.431	University Of Maryland At College Park	38796-Z8424103		$222,241
Scrutinizing ER Isoform Heterogeneity and Adverse Patient Outcomes in Triple Negative Breast Cancer	12.420				$27,002
Selective AAK1 and GAK inhibitors for combating Dengue and other emerging viral infections	12.420			$121,935	$445,573
Semantic Information Pursuit for Multimodal Data Analysis	12.431	The Johns Hopkins University	2003514594		$242,452
Sensitizing Reaction Chemistry in Detonation	12.800				$206,820
Shock Tube Diagnostics and Performance Improvements	12.431				$172,710
Shock wave energy dissipation (SWED) by mechanochemically-active nanoporous materials	12.300	University of Illinois	2012-02341-02 (A0442)		$83,729
Shock-Tube Study of Energy Transfer Processes in High-Enthalpy Air	12.800	University of Michigan	3004167517		$197,518
Si Compatible Electrically Pumped Direct Bandgap Ge/GeSn Laser	12.800				$59,077
Single Sheet Lasers for Attojoule Optoelectronics	12.800	University of Texas at Arlington	26020149062		$6,688
Solving Complex Tasks with Team-Based Crowdsourcing	12.300				$221,469
Southern California Cetacean Behavioral Response Study	12.RD	Cascadia Research	Subcontract 467-Stanford		($37)
Space surveillance with correlation based radar	12.800				$145,858
Spectroscopic Imaging of Defects Using Radiation-Actuated Scanning Electron Microscopy	12.800				$6,968
Spectroscopic Measurements and Nonequilibrium Modeling for High-Enthalpy Air	12.800	California Institute of Technology	S437969		$12,946
Spin squeezing for precision inertial sensing	12.300				$6,951
Split Chip Design for Obfuscation and IC Trust	12.910	Carnegie Mellon University	1150166-395566		$183,532
Stanford University/CWLP Mandarin Student Program	12.900				$12,891
STARTALK Teacher: Stanford University Teacher Leadership Seminar	12.900				$38,469
STARTALK University Teacher Leadership Seminar	12.900				$43,658
Statistical Tools for Reproducible Selections	12.300				$86,098
STELLAR (Super Turing Evolving Lifelong Learning ARchitecture)	12.RD	HRL Laboratories, LLC	17038-182019-QS		$82,060
Strengthening and Armoring of Sheared Granular Beds	12.431	Yale University	GK0000625(CON-80000153)		$67,045
Stretchable Polymer Semiconductors	12.800				$218,603
Sub-Hinze scale breakup model for high-fidelity simulation of bubbly flows	12.300				$23,633
Supermaneuverable Autonomous Pursuit: Peregrine Falcon Versus Pigeon Inspired UAVs	12.800			$136,200	$416,615

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Supplemental Realignment Proposal for SR-01: FDA IND-Enabling Studies and Recruitment of Clinical Trial Sites	12.420	Wake Forest University	WFUHS 441011 SR-01		$190,947
Surface Plasmon Resonance Instrument for Rapid Development of gold labeled Single-chain variable fragments for use in Structural Determination of Transcription related proteins	12.431				($5,194)
Surfaces, Particles, and Structured Liquids - Ultrafast Nonlinear Experiments	12.800				$155,750
Synthesis and Assembly of xDNA: Toward Unnatural DNA Nanostructures	12.431				$22,032
Synthesis and Development of High-Energy Molecular Ladder Scaffolds	12.RD				$200,316
Synthesis Planning and Reaction Discovery For Photochemistry and Chemistry in Novel Environments	12.300			$190,776	$946,449
Systems for Development of Hybrid Microwave-Optical Quantum Networks	12.800				($86)
TA2, 1000 Molecules	12.RD	Massachusetts Institute of Technology	S4598/PO #178124 S4566/Subaward PO # 155650	$92,212	$208,696
Targeting BMPR2 Signaling to improve Right Ventricular Function in Congenital Heart Disease	12.420				$518,809
Targeting Metastatic Breast Cancer with Copper Trap Assembled in Situ	12.420				$131,557
Targeting Toll-Like Receptor Signaling for Prevention and Treatment of Breast Cancer	12.420				$1,648
TBI Endpoints Development (TED)	12.420	University of California, San Francisco	8595sc/1169622-100-EHAWX 8595sc- 5		$41,281
The Attojoule Challenge in Photonics/Optoelectronics: Materials, Devices, Modeling and Architectures	12.431				$8,379
The Broad Band Receiver (BBR) Instrument on the Demonstrations and Science Experiments (DSX) Spacecraft	12.RD				$338,991
The Neuronal Roles of Mitofilin, a Housekeeper for Mitochondrial Crista Architecture	12.420				$497,438
The Role of Hypoxia in the Tumor Microenvironment: Implications for Ovarian Cancer Therapy	12.420				$230,199
The role of mesoscale strain in the near-surface decay and propagation of high-mode near-inertial wave energy	12.300				$59,975
The Role of Nemolike Kinase in the Pathogenesis and Treatment of Diamond Blackfan Anemia	12.420				$14,591
The Search and Theoretical Guidance for Higher Tc Superconducting Materials	12.800			$110,899	$433,264
Thermochemical Transformations Using Entropy-Stabilized Oxides	12.300				$154,115
Three-Dimensional Separated Flow over a Bump: Sensitivity to Geometric and Boundary Condition Variations	12.300				($3,139)
Top-Down And Bottom-Up Brain Mechanisms At Multiple Spatial And Temporal Scales: Experimental Investigation And Computational Modeling	12.300			$1,059,448	$1,507,767
Topics II.A.2.a and II.A.2.c: Photonic and Phononic Technologies for Superconducting Quantum Information Systems	12.431	California Institute of Technology	S387326		$413,188
Tourniquet Master Training System for Junctional and Inguinal Hemorrhage Control Devices (TMT)	12.RD	Charles River Analytics Inc.	SC1701903		$230,043
Toward Quasi-Ballistic Transport in 2D Transistors	12.800				$148,867
Toward Scalable Quantum Photonic Engineering with OPO Networks	12.431	California Institute of Technology	S398444		$41,300
Tracking, Diagnosing and Arresting Dielectric Breakdown Using Multiscale Characterization and Simulations	12.300	University of Connecticut	PO# 163166/KFS# 5641050		$238,714
Translating a stem cell-based therapy for epidermolysis bullosa into the clinic	12.420	University of Colorado Denver	FY19.489.001		$234,398
Transplantation of Photoreceptors for Restoration of Sight	12.420				$451,548
Trop2 as a novel driver and therapeutic target for castration-resistant prostate cancer	12.RD				$232,939
Tunable electromagnetic surfaces using hybrid semiconductor-plasmonic optoelectronics	12.300				$102,109
Tuning Metal-Insulator Transitions in Ultra-Thin Correlated Materials	12.800				$153,324
Ultrafast 2D IR Pulse Shaping Spectrometer for Tracking, Diagnosing and Impeding Dielectric Breakdown in Polymers	12.300				$370,306
Ultralow power, Ultrafast, Integrated Nano-Optoelectronics	12.800	University of Texas at Austin	UTA16-001253		$944,199
Uncovering Complex Reaction Networks from First Principles	12.300				$112,103
Understanding Air-film Breakup under Liquid impacts using Direct Numerical Simulations	12.300				$7,322
Understanding PAH Clustering Facilitated by Metal Cations at High Temperatures	12.800	University of Utah	10052440-S1// PO U000197139		$73,748
Understanding Scenes and Events through Joint Parsing, Cognitive Reasoning and Lifelong Learning	12.300	University of California, Los Angeles	1015 G TA275		$189,530
Unifying Weak Supervision Methods and the Fundamentals of Matrix-vector Multiply	12.300				$233,955
United States-Japan Polymer Symposium: "Macromolecules: Challenges and Opportunities for the 21st Century"	12.431				$10,000
Unmanned Aircraft Collision Avoidance: Coordination Strategies and Policy Verification	12.RD	MIT-Lincoln Laboratory (DOD)	7000335010		$4,633
Upscale: Scaling up formal tools for POSH Open Source Hardware	12.901			$343,759	$1,039,546
UV AND IR LASER SYSTEMS FOR SPECTRALLY-RESOLVED REACTING FLOW DIAGNOSTICS	12.800				$3,978
UV Laser System	12.800				($18,540)
Variational Methods for Information Processing and Learning	12.800				$15,958
Verified Application Debloating and Delayering	12.RD	Galois, Inc.	2017-010		$127,480
Visual common sense reasoning for multi-agent activity prediction and recognition	12.300	University Of Maryland At College Park	Z8995002		$90,280
W911NF-12-R-0011-04: Towards a process-based understanding of sediment degassing and ramifications for the mechanical stability of permafrost, Earth Material and Processes	12.431				$64,173
W911NF-12-R-0012-03: Deciphering the flow-to-fracture transition in frictional fluids	12.431				$11,413
Wall-modeled LES for high-speed transitional boundary layers interacting with incident shock waves	12.800				$426,099
Warfighter protection against blast / ballistic / directed energy threats via lightweight, wearable, reconfigurable colloidal gels	12.300				$473,012
What if we could electrically tune properties of strongly-correlated materials just like we can with semiconductors?	12.800			$103,808	$364,535
XASEM for Surface Chemical Imaging Approaching Atomic-Scale Precision	12.300				$8,258

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XRL: Explainable Reinforcement Learning for AI Autonomy	12.910	Carnegie Mellon University	1150156-381054		$20,261
Yeast Surface Display Approaches for Engineering Stabilized Viral Fusion Protein Subunit Vaccines	12.420				$8,799
YIP2015: Phase Change and van der Waals Engineering in Two-Dimensional Materials	12.300				$117,411
Department of Education					**$90,701,058**
2018 CLAS NRC-FLAS Application	84.015A				$116,603
2018 CLAS NRC-FLAS Application	84.015B				$206,367
2018 NRC-FLAS Application	84.015A				$158,376
2018 NRC-FLAS Application	84.015B				$266,359
A behavioral intervention to increase degree attainment among near completers	84.305	University of Virginia	GM10155 PO#2108287 GM10155-150690		$56,950
A Scalable Growth Mindset Intervention to Raise Achievement and Persistence in Community College	84.305A				$692,683
Aftershock: Aid, Ebola, and Civil Society in West Africa	84.022A				$11,008
Beyond Triage: A Randomized Experiment in Sustained Pre-College Advising	84.305E			$36,634	$63,250
California Mathematics Readiness Challenge Initiative	84.367B	California State University Monterey Bay	170306-5048301A-C-A		$7,124
Developing and Testing Multi-Component Computer-Based Assessment Tasks for the Next Generation Science Standards	84.305	University of California, Berkeley	00009173/PO BB00774256		$66,752
Federal Direct Student Loan Program - PLUS Loans - Graduate and Parent - New Loans Issued	84.268				$23,716,681
Federal Direct Student Loan Program - Subsidized Stafford Loans - New Loans Issued	84.268				$869,749
Federal Direct Student Loan Program - Unsubsidized Stafford Loans - New Loans Issued	84.268				$20,819,285
Federal Perkins Loan Program - Administrative Allowance	84.038				$0
Federal Perkins Loan Program - New Loans Issued	84.038				$0
Federal Perkins Loan Program - Outstanding Balance as of 09/01/2018	84.038				$33,777,707
Federal Work Study FY17-18	84.033				$306,847
Federal Work Study FY18-19	84.033				$1,115,313
Federal Work Study FY19-20	84.033				$372,436
Fostering Reliance on Visuospatial Representations to Enhance High School Students¿ Success in Pre-Calculus Trigonometry	84.305A				$144,272
IES FY 2014 Predoctoral Training	84.305B				$769,425
IES Post doc Training	84.305B				$100,898
Investing in Innovation Fund (i3), CFDA 84.396B	84.396B	New Schools for New Orleans	SPO# 121617		($27,804)
Mission Promise Neighborhood Evaluation	84.215	Mission Economic Development Agency	110547		$5,314
National Resource Center - Center for Latin American Studies	84.015A				$62,942
National Resource Centers Program and Foreign Language and Area Studies Program	84.015A and 84.015B				$17,080
National Resource Centers Program and Foreign Language and Area Studies Program	84.015B				($1,898)
NATIONAL RESOURCE CENTERS PROGRAM CFDA NO. 84.015A & FOREIGN LANGUAGE AND AREA STUDIES FELLOWSHIPS PROGRAM CFDA No. 84.015B	84.015A and 84.015B				$14,144
NATIONAL RESOURCE CENTERS PROGRAM CFDA NO. 84.015A & FOREIGN LANGUAGE AND AREA STUDIES FELLOWSHIPS PROGRAM CFDA No. 84.015B	84.015B				$500
PELL FY17-18	84.063				$494
PELL FY18-19	84.063				$5,606,365
SEOG FY17-18	84.007				($314,406)
SEOG FY18-19	84.007				$1,282,585
Stanford World Language Project ESSA 2018-2019	84.367A	University of California Office of the President	ESSA 2018-2019		$46,160
Stanford World Language Project ESSA 2018-2019	84.367A	University of California Office of the President	ESSA18-CWLP-STANFORD		$128,739
TEACH FY18-19	84.379				$196,508
TEACH FY19-20	84.379				$46,250
Department of Energy (DOE)					**$20,359,759**
A Field Study of the Stimulated Reservoir Volume, Detailed Fracture Characteristics, and EOR Potential in the Eagle Ford Shale Formation.	81.089	Texas A & M University	M1802544		$104,533
A Multi-Model, Multi-Scale Research Program in Stressors, Responses, and Coupled Systems Dynamics at the Energy-Water-Land Nexus	81.049			$1,172,476	$1,668,077
A Renewal Proposal to Investigate the Roughness and Advance Rate of the Weathering Interface	81.049	The Pennsylvania State University	5715-SU-DOE-5675		$22,510
A SYSTEMS BIOLOGY APPROACH TO MICROBIAL SYMBIOSES	81.RD	Lawrence Livermore National Laboratory	B612106		$64,133
Accelerated Scaling to Rapid Open-Air Fabrication of Durable Perovskite Solar Modules	81.087				$320,428
An Unsolicited Request by the Energy Modeling Forum for Funding to the Department of Energy Energy Information Administration	81.036				$210,924
Assimilation of Multiscale Data into Multifidelity Biogeochemical Models	81.049			$42,062	$154,419
Bridging Scales in Geomechanics: Fluid Flow, Solid Deformation, and Microstructure Characterization	81.049				$184,127
Center for Mechanistic Control of Water-Hydrocarbon-Rock Interactions in Unconventional and Tight Oil Formations	81.049			$336,677	$1,328,459
Center for Nanoscale Control of Geologic CO2 (NCGC)	81.RD	Lawrence Berkeley Laboratories, University of California	SUBK: 7219153		$24,976
Chemical Kinetic Modeling Development and Validation Experiments for Direct Fired sCO2 Combustor	81.089	University of Central Florida	16266143-Stanford		$19,520
Climate Specific EVA Adhesion Degradation Model	81.RD	National Renewable Energy Laboratory	UGA-0-41028-07		($3,345)
Conformational and Chemical Dynamics of Single Proteins in Solution by Suppression of Brownian Motion	81.049				$256,697
DARK MATTER SEARCH EXPERIMENTS: SuperCDMS Soudan and SuperCDMS SNOLAB	81.049				$330,880
Data Driven Approach to Dislocation-Based Plasticity Models of Face-Centered Cubic Metals	81.049				$215,052
Defining the Minimal Set of Microbial Genes Required for Valorization of Lignin Biomass	81.049				$176,621

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Federal Grantor/Federal Program Title	Federal CFDA Number	Pass-Through Entity Name	Pass-Through Entity Identifying Number	Amount Passed through to Sub-Recipients	Total Federal Expenditures
Develop Analytical Performance Models for Multiple-N3XT Systems and Develop Compact Thermal Models for Memory Technologies on Si CMOS	81.RD	Brookhaven National Laboratory	360329		$41,820
Development and Implementation of Eulerian Strength Model for Multi-Material Elastic-Plastic Flow	81.RD	Lawrence Livermore National Laboratory	B612155 B625957		$75,116
Development of a molecularly informed biogeochemical framework for reactive transport modeling of subsurface carbon inventories, transformations and fluxes	81.049			$61,299	$80,272
Development of Approaches to Model Excited State Charge and Energy Transfer in Solution	81.049	University of California, Merced	E252GTA350		$117,628
DOE-Cyclotron Road Project	81.117	Activation Energy Inc	DE-EE0008239-S-SGPC-001		$7,436
Does mycorrhizal symbiosis determine the climate niche for Populus as a bioenergy feedstock?	81.049				$179,209
ECP - Enhancing and Hardening the Legion Programming System	81.RD	Triad National Security, LLC	Sub No. 436263		$284,316
EGS Collab SIGMA-V	81.000	Lawrence Berkeley Laboratories, University of California	7352162		$90,220
Enabling Catalytic Strategies for Biomass Conversion	81.049				($29)
Experiment Study of Neutrino Properties: EXO-200 and nEXO	81.049				$649,334
Experimental Challenges in Probing Dark Energy through Weak Lensing with the Large Synoptic Survey Telescope	81.049				$75,107
Experiments and Simulations of Hypervelocity Impact Plasmas	81.049				$4,362
Fast and Robust Hierarchical Matrix Solvers	81.RD	Sandia National Laboratories	1759540 - Master 918800		$87,978
Frontiers in Quantum Metrology and Transduction	81.049				$1,005,987
Fundamental aspects of Spacetime and Quantum Fields	81.049				$160,602
Fundamental physics of hypersonic laminar-turbulent transition	81.RD	Sandia National Laboratories	PO 1987733 // Master 1918121		$129,765
High Efficiency Wafer-Scale Thermionic Energy Converters	81.135			$339,971	$340,892
High-Pressure Shock Tube Ignition Delay Time Experiments	81.049	Combustion Science & Engineering Inc	139501		$22,630
Hydrodynamics Adaptive Mesh Refinement Solver (HAMeRS)	81.RD	Los Alamos National Laboratories, University of California	431679		$26,825
Intelligence Community Postdoctoral Research Fellowship Program	81.U03				$3,835
Legion Applications	81.RD	Triad National Security, LLC	502266		$73,864
Light-Material Interactions in Energy Conversion	81.049	California Institute of Technology	S390426 (67N1095803)		$54,160
Light-matter interaction in nanoscale systems for energy applications	81.049				$297,716
Low-Cost High-Reliability Thermoelectrics for Waste Heat Conversion	81.RD	Lawrence Berkeley Laboratories, University of California	7466483		$27,036
Low-Cost Scaffold-Reinforced Perovskite Solar Modules with Integrated Light Management	81.087				($18,217)
Matter in Extreme Conditions hutch at the Linac Coherent Light Source	81.RD	Triad National Security, LLC	519399		$32,385
Mechanical Behavior of Hybrids with Hyper-Connected Molecular Networks	81.049				$163,829
Mesoporous Materials: Dynamics, Structure, Interactions, and Processes	81.049				$362,385
Metabolic Constraints of Organic Matter Mineralization and Metal Cycling During Flood Plain Evolution	81.049			$61,130	$145,748
Models for Scale Up of flow through electrode capacitive deionization (FTE-CD) systems	81.RD	Lawrence Livermore National Laboratory	B625932		$99,842
Modular Microbial Electromethanogenesis Flow Reactor for Biogas Upgrading eXCHANGE Control Number: L045-1517	81.RD	Lawrence Livermore National Laboratory	B631127		$125,756
Modular Microbial Electrosynthesis Flow Reactor	81.RD	Lawrence Livermore National Laboratory	B627559		$22,958
Multiscale dynamics of reactive fronts in the subsurface	81.049				$217,443
Nanosystems for Highly Energy-Efficient High-Performance Computing	81.RD	UT-Battelle LLC	4000158611		$127,246
Natural gas leakage simulation collaboration	81.RD	Sandia National Laboratories	PO# 1738103		$500
New Searches for Ultralight Particles	81.049				$120,189
nEXO large area SiPM readout test tile	81.RD	Lawrence Livermore National Laboratory	B631872		$70,512
Next Generation Printable and Low Power Flexible Organic Transistors based on the Electric Double-Layer Capacitance Effect and Active Layer Blending	81.U02				$15,829
Novel chalcopyrites for advanced photoelectrochemical water-splitting	81.087	University of Nevada, Las Vegas	GR06925/DE-EE0008085		$31,566
Novel materials for renewable energy	81.049				$125,372
Open and Scalable Distributed Energy Resource Networks	81.135			$210,412	$965,035
Perovskite on Silicon Tandem Solar Cells	81.087			$135,183	$455,216
PhILMs: Collaboratory on Mathematics and Physics-Informed Learning Machines for Multiscale and Multiphysics Problems	81.049				$202,216
Photonic Structure Textiles for Localized Thermal Management	81.135				($1,457)
Photonics at Thermodynamic Limits	81.049			$604,192	$1,812,380
Predictive Analytics for Natural Gas Leak Detection and Mitigation	81.RD	National Renewable Energy Laboratory	UGA-0-41028-08		$64,292
Predictive Simulations of Particle-laden Turbulence in a Radiation Environment	81.124			$273,860	$2,993,428
Preparation, deployment and analysis of data from a dual-phase xenon detector deployed at a neutron beam.	81.RD	Lawrence Livermore National Laboratory	B630477		$20,348
Probing Strong-field Effects in QED on FACET-II	81.049				$2,295
Protective catalyst systems on III-V and Si-based Semiconductors for Efficient, Durable Photoelectrochemical Water Splitting Devices	81.087				$235,349
Research in Integrated Assessment Inter-Model Development, Testing and Diagnostics	81.049				$37,228
ReSource: Utilizing CO2 for Commodity Polymer Synthesis	81.135				$389,598
RESPONSE OF SUBSURFACE NITROGEN-CYCLING MICROBIAL COMMUNITIES TO ENVIRONMENTAL FLUCTUATIONS	81.049				$48,401
Scalable Integration of Domain Knowledge into Machine Learning via Multi-modal Data Programming and Automated Model Selection	81.U04				$9,998
Selective Catalytic Oxidations: Opportunities and Challenges for Selective Conversion of Renewable Resources	81.049				$221,924
Spin Functionality Through Complex Oxide Heteroepitaxy	81.049				$149,859
Stochastic models of chemistry revealed by statistical learning methods	81.112	Washington State University	21238_G003697		$197,665
Studies of Surface Reaction Mechanisms in Atomic Layer Deposition	81.049				$117,664

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SynPLASTome 2.0: Synthetic Plastid Genome to Reprogram Chloroplast Function for the Production of Fuels and Chemicals	81.135	University of Tennessee	9500072841		$182,794
The Center for Enhanced Nanofluidic Transport (CENT)	81.049	Massachusetts Institute of Technology	S4687 - PO 242245		$121,197
The Geometry and Flow of Quantum Information: From Quantum Gravity to Quantum Technology	81.049	University of California, Berkeley	00010057; DE-SC0019380		$45,605
Thermal flow testing for SIGMA-V	81.000	Lawrence Berkeley Laboratories, University of California	7348695		$55,431
Thermal Switch Materials for Building Envelopes: A New Paradigm for Spatial and Tem-poral Optimization of Building Thermal Energy	81.000	Lawrence Berkeley Laboratories, University of California	7465477		$11,705
Thermal Transport Modeling and Qualification of Strength in Metal Additive Manufacturing Processes	81.RD	Sandia National Laboratories	PO 2058646 // Master 1918121 PO 1801759, // Master 918800		$137,770
Thermoacoustic Root Imaging, Biomass Analysis, and Characterization	81.135			$34,591	$556,591
Transient kinetic testing of entropy stabilized oxides	81.RD	Battelle Energy Alliance, LLC (BEA)	Contract 192131		$74,966
Tuning Organic Semiconductor Packing and Morphology through Non-equilibrium Solution Processing	81.049				$190,819
Ultra-High Speed Neutral Plasma Jets and their Interactions with Materials Generating Extreme Conditions	81.112			$21,779	($16,372)
Uncertainty estimation for BHR predictions of variable density flows	81.RD	Triad National Security, LLC	536415		$47,862
Using Systems Approaches to Improve Photosynthesis and Water Use Efficiency in Sorghum	81.049	Donald Danforth Plant Science Center	23207-S		$237,125
Variable Property Mixing in Transitional and Turbulent Regimes	81.RD	Los Alamos National Laboratories, University of California	518570		$51,044
Wearable Electroactive Textile for Physiology-Based Thermoregulation	81.135	SRI International	119-000278		$3,870
Wide Bandgap Chalcopyrite Photoelectrodes for Direct Solar Water Splitting	81.087	University of Hawaii	GR06642		$180,478
Department of Health and Human Services (DHHS)					**$546,524,743**
"NIH StrokeNet National Coordinating Center" - Administrative Consulting Agreement - Albers	93.853	University of Cincinnati	NS086872/011414-Adm-Albers		$7,733
"Peripheral mechanisms of homeostasis and tolerance through skin dendritic cells.	93.846	Brigham and Women's Hospital	115698		($3)
"Prospective evaluation of a surgical solution for breast cancer-associated lymphedema".	93.394	Fibralign Corporation	R44CA203608-Stanford		$246,530
(#6) A novel animal model for determining the role of circadian timing in breast cancer development	93.396				$199,660
(PQ1) Identifying and targeting human glioblastoma migrating in the peritumoral niche	93.393				$286,358
(PQ4) Quantitative and multiplexed analysis of gene function in cancer in vivo	93.396				$416,992
(PQ7)Multi-scale Analysis of Tumor Microenvironment Heterogeneity	93.396				$636,300
(PQD2)New Biomarkers and Pathways to Enhance Cure in Ovarian Cancers	93.394				$20,762
1/2 Genomic Strategies to Identify High-Impact Psychiatric Risk Variants	93.242	University of California, Los Angeles	2000 G SG 173		$1,956
2/2-Mechanism of Antidepressant-Related Dysfunctional Arousal in High-Risk Youth	93.242			($254)	$546,489
24/7 Closed Loop Insulin Delivery in Older Subjects with Type 1 Diabetes	93.853	University of Cambridge	RG84379; DAN06		$19,508
3 D Electron Microscopy of Macromolecules	93.859			$95,100	$1,619,027
3D Dynamic Contrast-Enhanced US for Monitoring Chemotherapy of Liver Metastasis	93.394				$132,878
3D Passive Cavitation Imaging-Guided Therapeutic Delivery of MicroRNA into Cancer	93.286				$77,384
3D Structure and mechanism of the alpha7 nicotinic acetylcholine receptor	93.853	University of Texas Southwestern Medical Center Dallas	GMO180301 / PO RGC0000001443		$9,632
4/7 Psychiatric Genomics Consortium: Finding actionable variation	93.242	University of California, San Diego	78717548 / PO# S9001508		$19,987
5'UTR RNA Regulons in ribosome-mediated control of embryonic development	93.865				$469,738
A "Circuits-First" Platform for Personalized Neurostimulation Treatment	93.242				$918,809
A "Culture" Shift: Integrated Bacterial Screening and Antibacterial Susceptibility Test on Microfluidic Digital Array for Bloodstream Infections	93.855	The Johns Hopkins University	2003726059		$281,121
A 5 minute motion-corrected pediatric brain MRI protocol	93.865				$57,165
A Biobehavioral Research Training Program	93.242				$282,864
A Bioorthogonal Approach to Study Mammalian Aging	93.310				$819,649
A Brain Circuit Program for Understanding the Sensorimotor Basis of Behavior	93.853	University Of Washington	UWSC10311; BPO 40343 1028077-719-EAFGS		$61,718
A chemical biology approach towards understanding the anti-cancer innate immunity	93.396				$36,631
A Clinical Center to Study Immunological and Hormonal Biomarkers for the Diagnosis, Prediction and Treatment of Chronic Pancreatitis and its associated development to Diabetes and Pancreas Cancer	93.847				$488,841
A clone's genomic stability as biomarker of its DNA-damage resilience	93.398				$81,477
A complete map of the top 100 molecules from the gut microbiome	93.310				$939,137
A Critical Role for Leukotriene B4 in Lymphedema	93.837	Palo Alto Veterans Institute for Research	NIM0013-02 NIM0013-01		$60,306
A Dashboard of Racial/Ethnic Disparity in Care Provided by NICUs	93.865			$197,842	$585,787
A Data Coordinating Center for ENCODE	93.172				$5,681,169
A Discovery Engine For Reproducible and Comparable Multi-Omic Analysis	93.859			$77,351	$228,845
A Droplet-Based Single Cell Platform Identification and AST	93.855	The Johns Hopkins University	2002692528		$177,422
A Facebook Intervention for Young Sexual and Gender Minority Smokers	93.307	University of California, San Francisco	10346sc		$3,449
A Gene-Complete Computational Model of Yeast	93.310				($4,060)
A Genomic Framework for Molecular Risk Prediction & Individualized Lymphoma Therapy	93.394				$41,779
A High-Throughput Platform for Crystallography-Based Fragment Screening	93.859	Accelero Biostructures Inc	1001-002 (SPO 132559)		$88,725
A low blood volume platform for global newborn screening of common, treatable conditions	93.865	Baebies, Inc.	1R44HD096981-01		$17,556

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A mitochondrial membrane-spanning ternary complex regulates mitochondrial motility	93.866				$100,517
A molecular signaling pathway underlying differential predisposition of ApoE4 genotype to Alzheimer's disease	93.866				$102,935
A monkey model of naturally occurring social impairments	93.865			$215,038	$378,869
A Multicenter Study of EEG in Premature Infants with Neonatal Encephalopathy	93.853				$192,144
A Nanoscale Plasmonic-Gold Platform for Specific Diagnosis of Zika and Differentiation from other Flavivirus Infections	93.855	Nirmidas Biotech, Inc.	128588		$76,664
A new class of CSF-1R radioligands for monitoring glioblastoma progression and therapy	93.394				$92,239
A New Direction to Achieve Ultra-Fast Timing for Positron Emission Tomography	93.286				$495,893
A NEW FRAMEWORK FOR UNDERSTANDING THE MECHANISMS OF DIASTOLIC DYSFUNCTION	93.837	Palo Alto Veterans Institute for Research	ENN0001-01 ENN0001-02		$392,920
A New Paradigm for Hypertension in the Elderly- Beyond Age	93.866	Northern California Institute for Research and Education	PER1868-02		$116,382
A new strategy for cell-type specific gene disruption in flies and mice	93.242			($212)	$47,554
A Noninvasive Integrated Genomic Approach for Early Cancer Detection and Risk Stratification after Transplantation	93.394				$400,639
A Novel Chimeric Antigen Receptor T-cell Targeting B7-H3 for the Treatment of Osteosarcoma and Ewing Sarcoma	93.397	Sarcoma Alliance for Research through Collaboration	SPORE-Y5-CDP-1-STANFORD-MAJZNE		$37,908
A Novel Cognitive Reappraisal Intervention for Suicide Prevention	93.242	Cornell University	184208-2		$44,010
A Novel Neuromonitoring Guided Cognitive Intervention for Targeted Enhancement of Working Memory	93.242				$182,777
A Novel Oral Therapeutic for Hepatocellular Carcinoma	93.395	Eiger Group International Inc	121718		$4,407
A Novel Platform for Synthesis of Programmable Proteome-Scale Peptide Bead Arrays	93.859	University of California, San Francisco	10080sc		$264,518
A Novel Positron Emission Tomography Strategy for Early Detection and Treatment Monitoring of Graft-versus-host Disease	93.394				$420,729
A Novel Prdm14-containing Protein Complex Regulates Chromatin in Stem Cells, Development, and Cancer	93.398				$7,903
A novel RNA-guided platform for sequence-specific cell reprogramming	93.310				$362
A phase 1/2 study of nivolumab (IND# 124729) in children, adolescents, and young adults with recurrent or refractory solid tumors as a single agent and in combination with ipilimumab	93.RD	Children's Hospital of Philadelphia	PO 9500060716-05C/FP00013560		$15,000
A Phase II Trial of MK-3475 (pembrolizumab) and Interferon Gamma 1-b Combination Immunotherapy in Patients with Previously Treated MF/SS	93.353	The Fred Hutchinson Cancer Research Center	916861		($757)
A Population-based Study of SLE Pregnancy: Risks and Outcomes in Mother and Child	93.846				$102,726
A Quantitative Multiplexed Platform for the Pharmacogenomic Analysis of Lung Cancer	93.395				$549,135
A Randomized Controlled Trial of a Group-Based Therapeutic Yoga Intervention for Urinary Incontinence in Ambulatory Older Women	93.847	University of California, San Francisco	11117sc		$151,559
A Randomized, Double-Blind, Placebo Controlled Pilot Trial of Oral Salsalate in the Treatment of the Subset of Unexplained Anemia in Elderly Patients with Elevated Interleukin-6 (PACTTE)	93.866	Duke University	2038378		$38,236
A Sleep-Oriented Intervention for Suicidal Behaviors	93.242				$2,337
A Stanford - SJSU Postdoctoral Training Program to Enhance URM Teaching	93.859				($5,324)
A Synchrotron Radiation Structural Biology Resource	93.859			$52,927	$4,310,846
A Systems Biology Approach to Study Cardiac Arrhythmias: iPS Cells and In Silico Modeling	93.837			$126,201	$350,580
A technique for measuring eye movements in small and/or freely moving animals	93.867				$10,735
A Toolkit of Peptide-Drug Conjugates for Targeted Delivery to Brain Tumors	93.397	Massachusetts Institute of Technology	101639		($194)
A versatile system for cell-specific control of gene expression in the fly brain	93.853			($5,355)	($5,355)
A Wireless, Implantable Microdevice for Closed-Loop Drug Delivery to Prevent the Morbidity of Diabetes Therapy-Induced Hypoglycemia	93.286				$635,055
a-Catenin/F-actin Structure at Cell-Cell Junctions	93.859	Sanford Burnham Medical Research Institute	60019-12914-SU		$218,665
Accelerated dissociation of IgE receptor complexes	93.855				$443,973
Accelerating drug development and repurposing using systematic genetic interaction maps in mammalian cells	93.865				$384,403
Accelerating Solutions to Optimize Glycemic Control and Weight Management In Young Adults with Type 1 Diabetes	93.847	The University of North Carolina at Chapel Hill	5107491 5107491-2		$91,487
Accessing the Neuronal Scale: Designing the Next Generation of Compact Ultra High Field MRI Technology for Order-of-Magnitude Sensitivity Increase in Non-Invasive Human Brain Mapping	93.286				$215,891
Accuracy and integration of large scale data from genome sequencing and mobile sensors	93.RD				$312,415
ACE Collaborative Projects	93.855	University of California, San Francisco	9439sc		$125,310
ACE: Autoimmunity Center of Excellence (ACE) at Stanford.	93.855				$242,959
Actin-Based Motility of a Bacterial Pathogen	93.855				$7,684
Activation of Cardiac FGFR4 Causes Left Ventricular Hypertrophy	93.837	University Of Alabama In Birmingham	OSP# 000516856		$26,788
Active surveillance and patient reported outcomes in a diverse population of prostate cancer patients	93.393	University of California, San Francisco	10349sc		$136,209
Activity-dependent Synaptic and Circuit Plasticity	93.242				$2,245,780
Acute/chronic limitations to transcriptional RNAi therapies for infectious and other liver diseases	93.855				$549,512
AD/ADRD Supplement to CNS Deficits: Interaction of Age and Alcoholism	93.273	SRI International	157-000010		$133,118
Addressing Health Literacy and Numeracy to Prevent Childhood Obesity	93.865	Vanderbilt University Medical Center	VUMC39135		$24,326
Adipocytes are Important Players in the Acute Lymphoblastic Leukemia Microenvironment	93.396	University of California, Los Angeles	1645 G VA145		$63,715
Administrative Supplement to R01AG21055 Clinical, Imaging, and Pathological Studies in the Oldest Old: The 90+ Study	93.866	University of California, Irvine	2019-3722		$25,851
Adult and Pediatric Nephrology and Urology Research Training Program	93.847				$245,837
Advanced MR and CT Imaging for Understanding Acute Stroke Evolution and Predicting Response to Recanalization Therapy	93.286				$178,906
Advanced MR Imaging of Early Osteoarthritis	93.846				$161,844

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Advanced neural decoders for the restoration of communication	93.173			$132,037	$571,472
Advancing a broad-spectrum anti-influenza A virus RNA packaging inhibitor to an IND	93.855				$1,332,439
Advancing a Novel Potent Zika Virus Specific Nucleoside Analog to the Clinic	93.855	Riboscience LLC	1 R44 AI129024-01A1 SPO132442		$50,775
Advancing Broad Spectrum Host-Targeting Antiviral Strategies to the Clinic	93.855			$291,785	$3,176,930
Advancing Science & Policy in the Retail Environment (ASPiRE)	93.393	The University of North Carolina at Chapel Hill	5112337		$465,611
ADVL1412: PER CASE REIMBURSEMENT and PATIENT STUDIES FUNDS: NIH COG Phase 1 Grant (UM1CA097452)	93.395	Children's Hospital of Philadelphia	FP13560_SUB79_01		$1,645
Age induced enteric neural stem cell loss through Foxo3 dependent inflammation	93.847				$241,655
Age-related Changes in Human Retinal Microvasculature	93.867	Icahn School of Medicine at Mount Sinai	0255-3021-4609		$60,244
Age-related decline in interactions between context, cognitive control, and memory	93.866				$81,010
AIBP Mediates A NOVEL Interplay between cholesterol and Lymphangiogenesis	93.837	Houston Methodist Research Institute	15460004-139		$136,229
Alcohol disrupts the balance between dopamine and GABA co-released by midbrain dopamine neurons	93.273				$341,683
Alcohol-related sleep disturbances and circuit dynamics of arousal neuropeptides	93.273				$183,198
ALDH Activation to treat Fanconi Anemia	93.837				$632,440
Algorithms and Software for Provably Accurate De Novo RNA-Seq Assembly	93.172	California Institute of Technology	1168421-1-DJYCA S381159		$109,687
Aligned Nanofibrillar Scaffolds Enhance Angiogenesis and Viability in Ischemia	93.837			$62,500	$560,659
Allosteric modulation of the mu-opioid receptor	93.279	University of Michigan	Subaward # 3003633137		$95,610
Alzheimer's Clinical Trials Consortium (ACTC)	93.866	University of Southern California	111180852; PO 50767790		$6,544
Alzheimer's Clinical Trials Consortium (ACTC) (U24)	93.866	University of Southern California	105761496; PO 50796629		$15,793
Alzheimer's Disease Genetic Consortium	93.866	University Of Pennsylvania	573992; PO# 4038588		$6,873
American Heart Association Tobacco Center for Regulatory Science (A-TRAC) 2.0	93.837	American Heart Association	FX-ATRAC-2U54HL120163-SU-06		$25,014
American Initiative in Mast Cell Diseases (AIM)	93.350				$15,000
AMP RA/SLE Leadership Center	93.846			$713,933	$1,071,016
Amygdala mechanisms of pain aversion	93.853				$315,465
An 18F PET/NIRF Smart Probe for Identifying, Grading, and Visualizing Astrocytic Gliomas	93.398				$52,907
An enzymatic approach to study cancer-associated cell-surface glycoproteins: exploration of mucin-degrading bacterial metalloproteases	93.859				$60,677
An Essential Role for MiR-29b in the Protective Effect of Apelin in Diabetic Vascular Stiffness	93.837				$8,863
An integrated pipeline for accelerated plant natural product discovery	93.859			$373,710	$987,618
An interneuron-based cell therapy for epilepsy	93.853	University of California, San Francisco	9744sc		($2,876)
An open-label, multi-centre, randomised, single-period, parallel study to assess the efficacy, safety and utility of 12 month day-and-night automated closed-loop insulin delivery under free living conditions compared to conventional insulin pump therapy in children and adolescents with type 1 diabetes.	93.847	Jaeb Center for Health Research	DAN05-Hood		$64,831
Analysis of Nocardia Assembly-Line Polyketide Synthases and Their Role in Nocardiosis	93.859				$56,736
Anastrozole in Pulmonary Arterial Hypertension: AIPH2	93.837	University Of Pennsylvania	575951 / R01-HL134905		$34,894
Anchored Phosphatase and Transcription Factor Regulation in the Heart	93.837	University of Connecticut	UCHC7-98175577	$59,034	$166,420
Anesthesia Training Grant in Biomedical Research	93.859				$291,836
Angiogenic Tissue Engineering to Limit Post-Infarction Ventricular Remodeling	93.837				$4,014
Animal 7T MRI Scanner for Imaging Neural Circuits	93.351				$1,999,992
Annual Symposium of the AHA Basic Cardiovascular Sciences Council, 2018 Scientific Sessions: Pathways to Cardiovascular Therapeutics	93.837				$30,000
Antecedent Medical Conditions and Medications: Associations with the Risk and Prognosis ALS	93.161				$272,681
Antibiotics from nose and throat commensals that impact pathogen colonization	93.855	The Forsyth Institute	STAN101018-2580		$92,661
Antibody-fucosidase conjugates as therapy for hepatocellular carcinoma	93.398				$30,793
Antigen Presentation and T cell Programming in Human Autoimmune Diseases	93.855	Dana-Farber Cancer Institute (489)	Subaward 1006719		($5,977)
Anti-Interneuron Antibodies in Abrupt-Onset Pediatric Obsessive-Compulsive Disorder	93.242	Yale University	GR106053 (CON-80001750)		$1,045
Applicability of Mouse Breast Cancer Models to Tumor-Immune Network Investigation	93.396				$3,553
Applied Genomics in Infectious Diseases	93.855				$239,621
Applying novel technologies and methods to inform the ontology of self-regulation	93.279	Dartmouth College	R804 R1075		$233,636
Applying statistical learning tools to personalize cardiovascular treatment	93.837				$170,303
ARCADIA CSI (Cognition and Silent Infarcts)	93.853				$14,878
Architectural Basis of Leptin Transmembrane Signaling	93.847				($50)
Arizona Cancer and Evolution Center	93.397	Arizona State University	ASUB09 ASUB00000009		$22,592
ASD-Relevant Gene-Immune Interactions in the Developing Brain	93.242				$32,952
Assembly of the Central Olfactory Networks in Drosophila	93.173				$312,927
Assessing Photoreceptor Structure and Function in Normal and Diseased Retinae	93.867	Medical College of Wisconsin	2R01EY017607-10;PO# 1746916 5R01EY017607-11; PO 6067879		$29,163
Assessment of Low-Dose Radiation Risk and Mechanisms of Individual Radiosensitivity	93.837				$578,425
Astrocytic Control of GABA Inhibition in Epilepsy	93.853				$71,752
a-Synuclein and LRRK2 in the Pathogenesis of Parkinson's disease	93.853	Harvard University	113140 113140-4		$344,189

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Federal Grantor/Federal Program Title	Federal CFDA Number	Pass-Through Entity Name	Pass-Through Entity Identifying Number	Amount Passed through to Sub-Recipients	Total Federal Expenditures
ATP-Dependent Chromatin Regulation in Neurodevelopment and Human Disease	93.853				$480,268
ATP-Dependent Chromatin Remodeling in Human Malignancy	93.393				$509,854
Automated Volumetric Molecular Ultrasound for Breast Cancer Imaging	93.394			$85,310	$444,347
Axially-resolved Spectroscopic Ophthalmic Imaging	93.867			$72,701	$446,289
Axonal Hypofunction in a Maternal Immune Activation Model of Autism	93.242				$34,094
Axonal myelination of interneurons in cortex: functional significance and plasticity	93.853				$399,632
B and T Cell Biology of Protection from and Eradication of SIV/SHIV Infection	93.855	Emory University	A019541		$389,890
B- Cell Targeted Induction to Improve Outcomes in Pediatric Lung Transplantation	93.855	Washington University in St. Louis	WU-18-111 / PO: 2934663E		$36,591
B7-H3-Targeted Contrast Agent for Ultrasonic Detection of Breast Cancer	93.399	NuvOx Pharma LLC	1R41CA21354401-STN002		$2,069
Bacterial Cell Wall Composition and the Influence of Antibiotics	93.859				$434,906
Balanced Signaling cues to guide cell transitions in the blood lineage continuum	93.839	University of California, San Francisco	8960sc		$213,641
Bay Area Team Against Resistance	93.353	University of California, San Francisco	10606sc		$522,951
B-Cell Targeted Induction to improve outcomes in Pediatric Lung Transpantation	93.855	Washington University in St. Louis	WU-18-131 (frmly WU-17-257)		$493
BEG4/MIM Function in Epithelial Neoplasia	93.846			$50,164	$493,947
Beta-lactamase fluorescent probes for bacterial detection	93.855				$574,472
Beyond consent: patient preferences for governance of use of clinical data and samples	93.879			$37,170	$102,319
Beyond GWAS of insulin resistance: An integrated approach to translate genetic association to function	93.847				$443,586
BIDS-Derivatives: A data standard for derived data and models in the BRAIN Initiative	93.242			$106,286	$774,688
Big Data Analysis of HIV Risk and Epidemiology in Sub-Saharan Africa	93.855			$204,824	$483,677
Bilateral Closed Loop Deep Brain Stimulation for Freezing of Gait using Neural and Kinematic Feedback	93.853				$57,156
Bilirubin Binding Capacity To Assess Bilirubin Load in Preterm Infants	93.865			$11,713	$17,864
Binding of Epstein Barr Virus EBNA2 unifies multiple sclerosis genetic mechanism	93.RD	Cincinnati Children's Hospital Medical Center	138881/PO3100529997 138881/PO3100620274		$11,143
Binuclear Copper-O2 Intermediates: Thermodynamic and Mechanistic Insights	93.859				$233,134
Biochemical and cell biological mechanisms of signal transduction through the Hedgehog pathway	93.859				$644,329
Biochemical reconstitution of Wnt signaling complexes	93.859				$56,726
Biofilm Lithography: A newparadigm to optically control and study biofilm growth dynamics	93.855				$272,467
Biologic Inhibitor of Galectin-3 for Liver Fibrosis	93.847	MandalMed, Inc.	Prime AW #1R43DK107285-01A1		$53,534
Biological and clinical evaluation of the laryngeal mucus layer	93.173				$232,028
Biological and Psychosocial Mechanisms of Cancer Caregivers' Elevated Health Risk	93.361	University of Miami	SPC-000420		$27,507
Biologics Effectiveness and Safety (BEST) Initiative: Blood and Blood Product Safety Surveillance	93.RD	IQVIA RDS, Inc.	#2017-IMS-SC-S001		$44,500
Biomarkers for Post-Transplant Lymphoproliferative Disorders in Children	93.855			$106,419	$659,181
Biomedical Data Science Graduate Training at Stanford	93.879				$230,294
Biomedical Informatics Training at Stanford	93.879				$781,494
Biophysical mechanisms of mechanical tension sensing at cellular integrin complexes	93.859				$414,558
Biophysical studies of macromolecules and molecular assemblies	93.859				$580,797
Biorepository of Human iPSCs for Studying Dilated and Hypertrophic Cardiomyopathy	93.837				$1,527,289
Biosorter Pro large particle flow cytometer for organismal and large cell sorting	93.351				($23,222)
Bistability and trigger waves in cell signaling	93.859				$65,170
Blood Stem Cell Transplantation as Immunotherapy	93.837			$10,905	$1,538,496
BMT Clinical Trial Network at Stanford	93.839				$121,827
Bone Marrow Grafting for Leukemia and Lymphoma	93.395				$214,674
Brain Aging Studies with Single-Neuron Resolution Using Syringe-Injectable Electronics	93.866				$314,688
Brain and Behavior during Puberty in Klinefelter Syndrome	93.865			$58,309	$410,666
Brain-wide screen for a neural pacemaker of aging	93.310				$3,005,495
Breast Cancer Genetic Study in African-Ancestry Populations	93.393	Vanderbilt University Medical Center	VUMC65378		$17,962
Breast Pre-Cancer Atlas Center	93.353	Duke University	A030743		$5,185
Brief Behavioral Intervention for Insomnia During Chemotherapy	93.395				$404,392
Bringing laser focus to voltage imaging: Enhanced indicators and advanced scanning methods for two-photon recording of dense networks in vivo	93.853			$506,827	$1,008,413
California AHEC- 2017 - 2018 Western Region Public Health Training Center	93.516	University of California, San Francisco	9191sc		($6)
California Area Health Eduction Center (Federal AHEC)	93.107	University of California, San Francisco	10384sc		$26,596
California Center of BD-STEPS - Finding Causes and Preventives of Birth Defects	93.073				$357,315
CALIFORNIA CENTER OF BD-STEPS II - FINDING CAUSES AND PREVENTIVES OF BIRTH DEFECTS	93.073				$259,076
Caminemos Juntas: A Location-Based Smartphone App for Latinas to Connect with Nearby Walking Partners	93.307	Klein Buendel, Inc.	0321-0172-000		$247,112
Canary Cancer Research Education Summer Training (Canary Crest) Program	93.398				$229,023
Cancer Etiology, Prevention, Detection and Diagnosis	93.398				$486,503
Cancer Immunotherapy Trials Network Central Operations and Statistical Center	93.353	The Fred Hutchinson Cancer Research Center	957722		$242,109
Cancer Systems Biology Scholars Program	93.398				$521,739
Cancer-Translational Nanotechnology Training Program (Cancer-TNT)	93.398				$383,310
Cannabinoid control of epilepsy	93.853			$130,135	$358,721
Capturing the phenotypic landscape of single-nucleotide variation via systematic genome editing	93.859				$661,293
CAR T cell targeting of human islets	93.847			$77,000	$940,319

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Cardiac Mitohormesis Protects Against Diabetic Cardiomyopathy Through Mitophagy	93.837				$22,856
Cardiovascular Disease among Asians and Pacific Islanders	93.837	Kaiser Permanente	OOS030097-Stanford-01		$40,406
Cardiovascular Disease Prevention Training Program	93.837				$448,742
Carotid Revascularization and Medical Management for Asymptomatic Carotid Stenosis Trial (CREST-2)	93.853	Mayo Clinic	STA-224063		($649)
Castles made of sand: the genomics of complex behavior	93.859	Georgia Institute of Technology	RE690-G1		$27,789
Causal associations of circulating biomarkers with cardiovascular disease	93.837				$553,811
Causal mapping of emotion networks with concurrent electrical stimulation and fMRI	93.853	California Institute of Technology	S410591		$165,893
Causal mechanisms of distributed brain network function during episodic memory retrieval	93.242				$128,430
Causal variant association mechanisms in TCF21 binding coronary disease loci	93.837				$484,188
CCC for NHLBI Prevention and Early Treatment of Acute Lung Injury Petal-VIOLET	93.838	University of California, San Francisco	10044sc		($270)
CEDAR Template testing	93.RD	Leidos Biomedical Research Inc.	17x074T3		$161,139
Celigo S Imaging Cytometer (200-BFFL-S)	93.351				$167,502
Cell Characterization and Imaging for Regenerative Therapies in Ischemic Diseases	93.837	Indiana University	IN-4688172-LSJU		$99,933
Cell Characterization and Imaging for Regenerative Therapies in Ischemic Diseases	93.837			$41,712	$260,380
Cell cycle regulation of fate outcomes in adult stem cells during adaptive organ growth and homeostasis	93.859				$37,015
Cell Signaling and Cell Decisions	93.859				$410,596
Cell-based therapy in RA: proof of concept	93.846	Case Western Reserve University	RES512531 RES513739		$27,233
Cell-cell communications in neural circuit assembly	93.853				$401,290
Cell-Cell Junctions and Epithelial Homeostasis	93.859				$192,265
Celluar, molecular and quantitative imaging analysis of screening-detected lung adenocarcinoma	93.396	Vanderbilt University Medical Center	VUMC57212- 1		$94
Celluar, molecular and quantitative imaging analysis of screening-detected lung adenocarcinoma	93.989	Vanderbilt University Medical Center	VUMC57212		$63,000
Cellular and Mechanical Mechanisms Regulating Mandibular Distraction Osteogenesis	93.121				$365,392
Cellular and molecular analyses of hematopoietic stem cell [HSC] interactions with bone marrow niches to improve HSC engraftment for transplantation and tolerance induction	93.847				$442,952
Cellular and Molecular Biology Training Program	93.859				$1,173,118
Cellular and Molecular Mechanisms of Atrial Cardiomyocyte Lineage Commitment	93.837				$84,269
Cellular and Soluble Biomarkers of Post Treatment Control in HIV Infection	93.855	J. David Gladstone Institutes	R2462-B		$19,707
Cellular mechanisms in immune-driven placental injury	93.865				$41,712
Cellular Response to Genetic Change	93.859				$483,986
Center for Advanced Magnetic Resonance Technology at Stanford	93.286				$1,153,946
Center for Cancer Nanotechnology Excellence for Translational Diagnostics (CCNE-TD)	93.397				$1,716,347
Center for Dental, Oral, and Craniofacial Tissue and Organ Regeneration (C-DOCTOR)	93.121	University of California, San Francisco	10058sc		$868,613
Center for Excellence in Influenza Research Surveillance	93.RD	Emory University	T951266- 1 PO# A171211		$149,545
Center for Expanded Data Annotation and Retrieval (CEDAR)	93.855			$122,122	$269,768
Center for HIV/AIDS Vaccine Immunology and Immunogen Discovery	93.855	The Scripps Research Institute	5-53727		$72,147
Center for Integrative Research on Childhood Leukemia and the Environment	93.RD	University of California, Berkeley	00009022; PO BB00676408		$12,096
Center for Multi- and Trans-ethnic Mapping of Mendelian and Complex Diseases	93.172			$790,257	$1,140,336
Center for Personal Dynamic Regulomes	93.172				$2,849,080
Center for Solutions for ME/CFS	93.855	Columbia University	2(GG014214) 2(GG014214-02)		$60,696
Center for Sub-Cellular Genomics	93.172	University Of Pennsylvania	575330 PO 4205280		$134,945
Center for the Development of Phenotype-Based Treatments of Autism Spectrum Disorder	93.865	University of California, Davis	A18-0985-S002		$292,490
Center For The Structural Biology of Cellular Host Elements In Egress, Trafficking, and Assembly of HIV (Cheetah Center)	93.859	University of Utah	10044932-05;PO# U000157065		$26,664
Center for Undiagnosed Diseases at Stanford	93.310				$1,659,925
Center on The Demography and Economics of Health and Aging	93.866				$155,801
Centers of Excellence	93.157				$559,723
Central and Peripheral Measures of Pain: Recovery and Resistance	93.865	Boston Children's Hospital	PO# GENFD0001533821		$20,527
Central Thalamic Stimulation for Traumatic Brain Injury	93.853	Weill Cornell Medical College	170541-03 184028-03; 5UH3NS095554-03		$259,448
Centriolar-ciliary signaling mechanisms in tissue regeneration and differentiation	93.859				$66,294
Cerebellar Structure and Function in Alcoholism - Alzheimer's-focused administrative supplement	93.273			$166,160	$489,005
Cerebrovascular Reserve Imaging with Simultaneous PET/MRI Using Arterial Spin Labeling and Deep Learning	93.286				$352,349
Changes in Bone Quality, Sarcopenia and Fat Distribution in HIV/HCV Patients after HCV Therapy	93.855	University Of Pennsylvania	PO# 4195387		$22,587
Channel structure-based tools for precise interrogation of circuitry and behavior	93.242				$1,181,846
Characterization and Genetics of Objectively-Verified Long Sleep Hypersomnia	93.853				$47,505
Characterization and Targeting the GDNF and Other Pathways in Salivary Stem Cells	93.121			$30,163	$329,144
Characterization of central pain mechanisms using simultaneous spinal cord-brain functional imaging	93.853				$256,852
Characterization of recurrent cancer mutations that cause misregulated translation	93.398				($991)

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Characterization of Sexual Dimorphism in the brain	93.853				$410,435
Characterization of the functions of one-carbon metabolism across human cancers	93.398				$80,214
Characterization of the Mechanotransduction complex in hair cells	93.173				$93,171
Characterizing cognitive control networks using a precision neuroscience approach	93.242				$290,802
Characterizing head and neck tumor neoantigens and T cells: looking beyond the usual suspects	93.121				$365,053
Characterizing Low-Density Ganglion Cells in the Primate Retina	93.867				$23,513
Characterizing the assembly and age-related decline of neural circuits in Drosophila by single-cell profiling	93.866				$48,744
Characterizing the CHD8 Complex to Determine its Role in Autism Spectrum Disorder	93.242				$12,340
Characterizing the immune and metabolic profiles of cutaneous T-cell lymphoma in formalin fixed paraffin embedded skin tissue samples	93.398				$46,340
Characterizing the Regulation of Ferroptosis	93.859				$342,089
Charge Cloud Tracker : A High-Resolution, High-DQE, Photon-Counting Energy Discriminating X-ray Detector	93.286			$21,640	$39,273
Chemical biology of innate immunity for treating cancer and autoimmunity	93.310				$555,061
Chemical Glycoproteomics	93.394			$18,883	$370,728
Chemical Mycobacteriology	93.855			$10,932	$363,810
Chemical probes for specific targeting of matrix metallo proteases	93.396				$168,785
Chemical tools for developmental biology	93.859				$898,351
Chemically Triggered Morpholino Antisense Oligonucleotides	93.859	University of Pittsburgh	0047020 (126827-1)		($51,210)
Chemosensory tuft cells and intestinal homeostasis	93.847				$174,628
Chemotactic Signal Transduction	93.859				$2,326
CHILD NEUROLOGIST CAREER DEVELOPMENT PROGRAM (CNCDP)	93.853	Kennedy Krieger Institute	CNCDP		$7,717
Children's Health and Air Pollution in the San Joaquin Valley (CHAPS-SJV)	93.113	University of California, Berkeley	8271		$44,118
Chimeric Mice: Improving Drug Safety	93.847				$571,837
Chiral Inactivation of Amyloid Beta Toxicity	93.866	University of California, Santa Cruz	A18-0271-S001-P0646184		$25,838
Cholesterol Regulation of Lysosomes	93.837				$443,532
Chromatin changes in the thymus epithelium during aging	93.866				$52,761
Chromatin Dynamics During Epithelial Commitment	93.846				$107,612
Chromatin Dynamics in the Cell Cycle	93.859				$53,157
Chromatin dynamics, transcriptional activators and repressors in transition from proliferating progenitors to terminal differentiation during adult stem cell differentiation	93.865				$32,143
Chronic Hypertension and Pregnancy (CHAP)	93.837	University Of Alabama In Birmingham	000503570-006		$22,731
CHS Research Resources for the Cardiovascular Health of Older Adults	93.866	University Of Washington	UWSC11060		$3,615
Ciliary trafficking mechanisms underlying the human genetics of obesity	93.859				$425,461
Circuit mechanisms for encoding naturalistic motion in the mammalian retina	93.853	University of Chicago	FP069821-01		$39,647
Circuit Mechanisms for Prefrontal Control of Remote Memory	93.242				$41,823
CIRCULATING FACTORS THAT REGULATE BROWN AND BEIGE FAT	93.847				$270,821
Citizen Science to Promote Sustained Physical Activity in Low-Income Communities	93.394				$987,647
CITN-10 Neoantigen identification	93.RD	Leidos Biomedical Research Inc.	17X074-TO-2		$23,891
CLARITY: fully-assembled biology	93.242				$327
Clinical Acceptance of the Artificial Pancreas:the International Diabetes Closed Loop (iDCL) Trial Project	93.847	University of Virginia	GB10282 152881		$275,667
Clinical and molecular epidemiology of acute kidney injury after lung transplant.	93.847	University Of Pennsylvania	3918396		$47,470
Clinical Epidemiology of Infectious Diseases	93.855				$178,538
Clinical Genome Resource (ClinGen)	93.172			$1,278,829	$3,321,816
Clinical Pharmacogenetics Implementation Consortium (CPIC)	93.172	St. Jude Children's Research Hospital	112350010-7850863		$462,489
Clinical Validation and Supply of SRI Biodosimeter	93.RD	SRI International	21692		$150,410
Clinically Relevant Genome Variation Database	93.172			$226,361	$407,626
Clinician-scientist training program in otolaryngology	93.173				$229,388
Clonal expansion, resistance to efferocytosis and innate immunity in atherosclerosis	93.837				$504,475
Closed-loop intervention in epilepsy.	93.853			$253,752	$336,618
Clutter Suppression in Echocardiography Using Short-Lag Spatial Coherence Imaging	93.286			$94,241	$461,770
CMP-Neu5Ac: A Central Molecule in Bleeding Diseases and Mediator of a Novel Platelet Effector Function	93.839				$7,182
Co-engaging CD23 and BCR for enhanced neutralizing antibody responses	93.855				$66,849
Co-Formulations of Amylin Analogues with Insulin Analogues for Treatment of Diabetes	93.847				$285,556
Cognitive Behavioral Therapy for Psychosis (CBTp) Training for ETCH: Extended Consultation & Train the Trainer	93.243	Network180	PR728447		$8,859
Cognitive Behavioral Therapy for Psychosis (CBTp) Training for ETCH: Extended Consultation & Train the Trainer	93.958	Network180	E2020214600		$12,601
Cognitive resilience to Alzheimer neuropathologic changes in the Honolulu-Asia Aging Study and the Nun Study	93.866	Pacific Health Research Institute	21603-01		$193,805
Cohort Filtering Models to Identify Social Program Effects on Health Disparities	93.310				$275,826
Collaborative Research in Computational Neuroscience (CRCNS)	93.867	University of California, Los Angeles	1430 G SA696		$50,827
Combining systems biology and structural biology to find new therapeutics	93.859				$347,976
Committee Leadership: NIH National Clinical Trials Network (NCTN) Grant (U10CA180886)	93.395	Children's Hospital of Philadelphia	FP00015221_SUB699_01		$15,319
Committee Leadership: NIH National Clinical Trials Network(NCTN) Grant (U10CA180886)	93.395	Children's Hospital of Philadelphia	FP00015221_SUB698_01		$23,637
Comparative analysis of PCP signaling architecture	93.859				$369,747
Comparative Medicine Biosciences Training Program	93.351				$250,339
Comparative MHC and KIR immunogenetics in the Great Apes	93.855				$298,191
Comparative Modeling of Lung Cancer Prevention and Control Policies	93.393	University of Michigan	3003859580 PO#3005217536 Sub#3003750928		$289,615

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Comparative Modeling: Informing Breast Cancer Control Practice and Policy	93.393	Georgetown University	413458_GR4411138-SU		$245,749
Comparison study of myoelectric readings of the GI tract measured internally and externally in mini-pigs	93.310	G-Tech Medical, Inc.	137338		$25,310
Compounded Neuronal Damage in Comorbid Cigarette Smoking and Addiction	93.273	Indiana University	IN4687305SU / PO#2282884		$178,462
Comprehensive CT Guided Coronary Artery Bypass Graft Surgery	93.837				$159,164
Comprehensive MRI near Total Joint Replacements	93.286				$203,588
Comprehensive Structural and Functional Mapping of Mammalian Colonic Nervous System	93.310	University of California, Los Angeles	1556 G WA054		$62,797
Computational and brain predictors of emotion cue integration	93.242			$289,855	$617,474
Computational and circuit mechanisms for information transmission in the brain	93.853	Cold Spring Harbor Laboratory	64100314		$162,234
Computational Methods for Identification of Genetic Factors Affecting the Response to Drug Abuse	93.279			$402,959	$1,382,206
Computational tools for understanding chemically modified RNA structure and interactions	93.396				$109,861
Computational, Neural, and Behavioral Studies of Competition-Dependent Learning	93.242	Princeton University	SUB0000163		$56,519
Computing, Optimizing, and Evaluating Quantitative Cancer Imaging Biomarkers	93.394			$11,104	$657,207
Confirming the efficacy/mechanism of an adaptive treatment for adolescent anorexia nervosa	93.242			$329,856	$851,045
Confounder-Corrected Quantitative MRI Biomarkers of Hepatic	93.847	University of Wisconsin	550K410		$43,670
Congregate air sampling for population-based detection of tuberculosis	93.855			$87,130	$354,520
Connecting early signaling dynamics with fat cell differentiation using fluorescent biosensors and single cell imaging	93.847				$36,025
Consequences of Prolonged Febrile Seizures in Childhood	93.853	Duke University	2832377 2832791		$20,451
Conserved regulation of the switch from proliferation to differentiation in the germ line stem cell lineage	93.859				$351,023
Consortium for the Study of Chronic Pancreatitis, Diabetes, and Pancreatic Cancer: Coordinating and Data Management Center	93.847	University of Texas MD Anderson Cancer Center	3000971318		$35,834
Consortium for the Study of Chronic Pancreatitis, Diabetes, and Pancreatic Cancer: Coordinating and Data Management Center	93.847	University of Texas MD Anderson Cancer Center	3001152175		$3,261
Contrast-Enhanced Ultrasound Evaluation of Focal Liver Lesions in Patients with Cirrhosis or Other Risk Factors for Developing HCC	93.393	Thomas Jefferson University	080-30000-S27901; #2000072090		$86,282
Contribution of astrocytes to the Fragile X Syndrome	93.242	University of California, Santa Cruz	A17-0285-S001-P0636133		$64,964
Contribution of Gigantocellular neurons of the medullar reticular formation to awakening from a low brain activity state	93.853	Weill Medical College of Cornell University - New York	180533 190413		$264,652
Contribution of renal tubule insulin receptor on proximal tubule sodium transport and hypertension in the Metabolic Syndrome.	93.847				$52,947
Control and coordination of the maternal-to-zygotic transition.	93.865				$338,624
Control of Symbiotic Gene Expression in Sinorhizobium Meliloti	93.859				$2,418
Controlling the rate of adipocyte differentiation: Experiments and theory	93.847				$268,193
Controlling tissue size by noise and feedback	93.847				$224,720
Convergence of genetic and gestational immune mechanisms in 16p11.2-related ASD	93.242				$458,422
Convergence of genetic and gestational immune mechanisms in CHD8-related ASD	93.242				$522,213
Coordinating Center for the Undiagnosed Disease Network Phase II	93.172	Harvard University	153056.5112937.0506		$98,755
Coordination Center for Open Collaboration in Systems Biology - Supplement	93.396	Sage Bionetworks	CSBC-S2SU2017		$41,980
Core Infrastructure and Methodological Research for Cancer Epidemiology Cohorts	93.393	Columbia University	5(GG013725-01) SAPO# G12768 5(GG013725-03)		$351,233
Coronary Magnetic Resonance Angiography	93.837				$319,397
Correction of Mucopolysaccharidosis type 1: Targeting safe harbor loci using genome editing	93.853				$210,972
Cortical Hemodynamism and Oxygenation During Sleep and Cognition: Window to Cognitive Impairment and Neurodegeneration in Aging	93.866				$222,433
Cortisol Receptor Polymorphisms And Cortisol-Induced Emotion Changes In Major Depression	93.242				$216,879
Cost Effective, Synergistic Macromolecular Structure Determination, Analysis & Simulation	93.859				$609,161
Covalent Profiling of RNA Targets and Off-targets	93.859				$251,661
Coverage, Price, and Reimbursement for Multigene Tests for Cancer and Related Conditions	93.393	University of California, San Francisco	10856sc		$6,993
CRCNS: Role of Mossy Cells in Gating Plasticity Hippocampal Granule Cells	93.242				$1,392
Creating an artificial intelligence therapy-to-data feedback loop for child developmental healthcare	93.879				$19,283
Creation of new tools to study human microglia using blood cells	93.242				$64,617
Cross modal integration of molecular and physiological networks in ASD 2/2	93.242				$927,610
Cross-Species Multi-Modal Neuroimaging to Investigate GABA Physiology in Fragile X Syndrome	93.865				$292,867
CryoEM Data Collection Facility Consortium at NCMI	93.859				$488,931
CT Perfusion to Predict Response to Recanalization in Ischemic Stroke Project 2 (CRISP 2)	93.853				$71,211
CTLA4 expressed in B-1a regulates B-1a immune function	93.855				$625,509
Curcumin Supplementation for Improving Vascular and Cognitive Function in Chronic Kidney Disease	93.837	University of Iowa	W001052426 PO 1001936977		$22,723
Customized MSCs to Enhance Healing of Bone Defects	93.846				$405,013
CV7000	93.351				($23,310)
CyTOF Analysis of Immune Subsets After Tolerance Induction to Kidney Transplants	93.855	University of Wisconsin	Subaward 766K861 842K100		$122,866
DASSIM-RT and Compressed Sensing-Based Inverse Planning	93.395				$314,814
Data Fusion-A Self-Scaling, Open Source Registry Advancing Pediatric Pulmonary Vascular Disease Research	93.838	University of Colorado Denver	FY15.369.003; 2-5-M6137		$7,068
Data-Mining Clinical Decision Support from Electronic Health Records	93.113				$190,156
Data-Rich Strategies for Programming Ligand-Responsive RNA Regulatory Systems	93.859				$245,390
Deciphering the Inositol Phosphate Code in Viral Pathogenesis and Immunity	93.855				$125,904

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Decoding the regulatory architecture of the human genome across cell types, individuals and disease	93.172				$793,798
Decoding the RNA structrurome: method development and function analysis	93.172				($4,168)
Deconstructing Arousal Regulation Circuits for Optimal DBS Therapy Design	93.853				$409,022
Deconstructing the network mechanisms of chronic pain and reward in the amygdala	93.279				$80,866
Deep Learning for Pulmonary Embolism Imaging Decision Support: A Multiinstitutional Collaboration	93.879			$9,415	$285,756
Deep learning frameworks for regulatory genomics.	93.310				$374,975
Deep Super-localization Microscopy and Effectively Unbleachable Labeling for 4D Nucleomics	93.310				($299)
Defining Alcohol Binding Sites in Ligand-Gated Ion Channels	93.273			$13,841	$45,206
Defining and Reconstructing the Human Ancestral Microbiome	93.213				$1,070,649
Defining BMP-responsive lncRNA for bone regeneration	93.121				$111,069
Defining Cell Type Specific Contributions to fMRI Signals	93.242				$706,026
Defining modifiers and mechanisms of RAN translation	93.866				$446,558
Defining the Dynamic Epigenetic Landscape During Epithelial Commitment	93.846				($832)
Defining the Impact of Injuries in the Elderly	93.866				$33,549
Defining the Medulloblastoma Cancer Stem Cell Lineage Hierarchy by Notch Family Signaling	93.398				$36,038
Defining the molecular basis of autism caused by inherited null mutations in BAF53B	93.242				$38,332
Defining the Molecular Mechanism of Hypertrophic Cardiomyopathy with Human Induced Pluripotent Stem Cells	93.837				$188,583
Defining the Molecular Mechanisms of Misfolding Protein Sequestration	93.859				$55,171
Defining the Neuromolecular Signature of TMS-Augmented Hypnotic Analgesia in Fibromyalgia Syndrome	93.213				$24,473
Defining the novel eukaryotic biology of the Apicomplexan plastid	93.310				($192)
Defining the Role of Host Hsp70 Subnetworks in Dengue Virus Replication	93.855				$564,143
DEFUSE 3: Endovascular Therapy Following Imaging Evaluation for Ischemic Stroke 3	93.853			$19,327	$402,494
Defuse 3: EnDovascular ThErapy Follwing Imaging EvalUation for ISchemic StrokE 3	93.853	University of Cincinnati	010085- 128152		$95
Delineation of genetic architecture underlying complex traits at molecular, individual and population levels	93.859				$298,348
Dengue Human Immunology Project Consortium (DHIPC) - Systems Vaccinology of the Vi Conjugate Typhoid Vaccine in Infants	93.855	Icahn School of Medicine at Mount Sinai	0255-8677-4609		$1,953
Designer Tregs for restoring tolerance in patients with type 1 diabetes	93.847	University of California, San Francisco	10345sc		$154,152
Designing Food Voucher Programs to Reduce Disparities in Healthy Diets	93.837			$89,181	$542,912
Designing new aminoglycosides to alleviate inner ear toxicity	93.173				$655,961
DESI-MS detection of positive surgical margins in kidney cancer	93.394				$165,653
Detection of asymptomatic Salmonella enterica serotype Typhi and Paratyphi A carriage by serum antibodies targeting YncE	93.855	Massachusetts General Hospital	233137		$21,714
Determinants of age-induced hearing loss and reversal strategies	93.866	University of Nevada	UNR-17-46		$197,883
Determinants of ultra-low viral reservoirs in HIV infected children	93.865	University Of Washington	UWSC10077 BPO26954/BPO33467		$222,219
Determining feedback mechanisms between cell cycle and cell fate in pluripotent cells	93.859				$85,486
Determining how the G1/S cell cycle transition regulates the homeostasis of adult intestinal stem cells	93.859				$42,892
Determining the molecular mechanism of cell size control.	93.859				$508,234
Determining the Role of TCAB1 in Shaping Telomerase Function	93.866				$528,114
Developing 3D Craniofacial Morphometry Data and Tools to Transform Dysmorphology	93.121	University of Colorado Denver	FY16.236.006 /PO# 1000653236 FY16.236.008- 03; 2-5-M7102		$18,505
Developing a mechanistic neurobiological model of exposure therapy response based on fear extinction theory	93.242				$200,792
Developing a patient-centered model of the risk of perioperative complications in spine surgery	93.226				$304,910
Developing and Testing a Tool for Preference Elicitation in Carpal Tunnel Syndrome	93.846				$176,232
Developing approaches for universal organ transplantation	93.310				$357,737
Developing data tools to reduce CVD disparities via Health Information Exchanges	93.307				$182,869
Developing nanoparticle optical reporters of compressive, tensile, and shear forces for use in living cells and tissues.	93.859				$175,343
Developing nanoscale electrophysiology sensors for robust intracellular recording	93.859				$545,834
Developing Neuropathological Criteria for CTE	93.853	University Of Pennsylvania	568538; PO# 4065403 568538; PO #4344273		$36,013
Developing Novel Neuroprotective Strategies for EAE/Optic Neuritis	93.867				$278,497
Development and Cross-Validation of a Hospital Risk Screening Tool for Posttraumatic Psychological Disorder	93.307	Palo Alto Veterans Institute for Research	CAS0012-02		$62,654
Development and Translation of High Performance Receive Arrays for Pediatric MRI	93.286			$319,318	$691,230
Development and Translation of Hyperpolarized C-13 Prostate Cancer MRI Methods	93.286	University of California, San Francisco	11361sc		$13,124
Development and Validation of Radiation-Free Pediatric Renal Function Quantification	93.286			$121,928	$601,747
Development of a Commercial Platform for Discovery and Validation of Key Microbial Metabolites in CNS Disorders	93.279	Second Genome, Inc.	1R44DA043954 2017		$102,611
Development of a Multi-Virus, Whole Genome Sequencing Platform for Post-Transplantation Virus Characterization	93.855				$109,628
Development of a novel treatment for hyperbilirubinemia-induced kernicterus	93.865				$280,199
Development of Beta-Cell-Targeted Regenerative Therapeutics Using A Novel Prodrug Strategy	93.847				$54,247
Development of Face Perception: Cross-sectional and Longitudinal Investigations	93.RD				$446,401
Development of lariat-shaped caged morpholinos for optochemical gene regulation	93.859			$6,184	$1,389
Development of microfluidic blood-brain tumor barrier model to screen chemotherapeutic strategies for breast cancer brain metastases	93.398				$152,053

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Development of novel protein-based therapeutics for lung cancer	93.395	University of California, San Francisco	10698sc 10721sc		$129,929
Development of Visual Connections	93.867				$418,793
Development, Validation and Application of Metabolic Imaging in Glaucoma	93.867			$62,967	$398,977
Developmental Pathophysiology of Synapses in a Mouse Model of Fragile X Syndrome	93.865				$255,242
Developmental Synaptopathies Associated with TSC, PTEN, and SHANK3 Mutations (CT Pilot)	93.853	Boston Children's Hospital	GENFD0001329602 GENFD0001526726 GENFD0001526738		$115,596
Developmental trajectory of anxiety, avoidance, and arousal in girls with the FMR1 full mutation	93.242				$924,741
Developmental-Behavioral Pediatrics Training Program	93.110				$196,065
Developmentally programmed translational control of specialized cell cycles in male meiosis	93.859				$328,097
DHHS - Loans for Disadvantaged Students - New Loans Issued	93.342				$0
DHHS - Loans for Disadvantaged Students - Outstanding Balance as of 09/01/2018	93.342				$109,871
Diabetes, Endocrinology and Metabolism Training Grant	93.847				$362,358
Diagnostic signatures of Zika virus pathogenesis	93.855			$10,494	$139,242
Dietary and Microbial Reprogramming of Intestinal Microbiota-Produced Metabolites	93.847			$136,518	$703,082
Dietary Modulation of Neuroinflammation in Age-Related Memory Disorders	93.866	Columbia University	1(GG014813-01)		$23,730
Direct measurement of gene-environment interactions by high-throughput precision genome editing	93.113				$4,136
Direct visualization of cell-type specific Alzheimer¿s disease networks for drug development	93.866				$280,056
Discovering genetic and hormonal mechanisms underlying diabetes risk from flies to humans	93.847				$208,621
Discovering the mechanism of GPCR-mediated arrestin stimulation to enable effective drug therapies	93.859				$201,791
Discovering the mechanisms and functions of signaling by the calcineurn beta1 isoform	93.859				$126,312
Discovery and characterization of brain-wide neuromodulatory circuits regulating arousal	93.242				$108,461
Discovery and Development of Optimal Immunotherapeutic Strategies for Childhood Cancers	93.353	Children's Hospital of Philadelphia	Sub3201380619 PO200314999-RSUB		$3,180
Discovery and Development of Optimal Immunotherapeutic Strategies for Childhood Cancers (Project 1)	93.353	Children's Hospital of Philadelphia	3201380619 PO 20028638-RSUB		$46,903
Discovery and Development of Optimal Immunotherapeutic Strategies for Childhood Cancers (Project 2)	93.353	Children's Hospital of Philadelphia	3201380619 / PO 20031486-RSUB		$443,309
Discovery and Development of Optimal Immunotherapeutic Strategies for Childhood Cancers (Project 3)	93.353	Children's Hospital of Philadelphia	PO 20031487-RSUB / 3201380619		$3,348
Discovery and Engineering of Plant Natural Product Pathways	93.859				$358,756
Discovery of protein aggregates during vertebrate aging and neurodegeneration	93.395	University Of Minnesota	P005569701		$249,937
Discovery of protein aggregates during vertebrate aging and neurodegeneration	93.866				$511,016
Discovery of Synthetic Lethal targets for Recurrent Epigenetic Mutations in Acute Myeloid Leukemia	93.398				$96,864
Disentangling the human-vector relationship to disrupt dengue and chikungunya outbreaks in Kenya	93.855			$55,838	$257,627
Disparities in Care, Morbidity & Survival Among Infants with Birth Defects	93.307			$36,292	$290,503
Disparity Processing in Human Visual Cortex	93.867				$375,315
Disrupting IgE-Fc¿R1¿ Interactions: Novel Therapies for Allergic Disease	93.855				$41,801
Disruption of Wnt secretion via conditional deletion of Porcupine and Wntless in the developing mouse cochlea	93.173				($306)
Dissecting hypothalamic pathways that regulate sexually dimorphic behaviors	93.853				$17,113
Dissecting Mechanisms of Granuloma Macrophage Polarization and Granuloma Formation in Chronic Salmonella Infection	93.855				$93,024
Dissecting Neural Circuit Computations in the Peripheral Visual System	93.867				$331,793
Dissecting the cognitive roles of hippocampus and other temporal lobe structures in patients undergoing epilepsy surgery	93.853	Emory University	T234780		$2,555
Dissecting the function of the ß3 subunit of the GABAA receptor ex vivo and in vivo	93.853				$58,486
Dissection of the role of serotonin circuits in reward and aversion	93.242				$137,890
Disseminating a validated mouthguard sensor to investigate the effect of head impacts on brain health	93.853				$216,707
Distinct contributions of Gli2 in breast cancer epithelium and stroma	93.398				$67,614
Diverse Ancestry Biobank to Map Biomedical Traits and Elucidate Health Disparitie	93.172	Mt. Sinai School of Medicine	0255-6425-4609		$47,461
Diversifying interferon functions through combinatorial and structural biology	93.398				$28,311
Diversity Action Plan for Summer Research	93.172				$11,974
DIVINCI: Dissection of Influenza Vaccination and Infection for Childhood Immunity	93.855	St. Jude Children's Research Hospital	112525010-7883509		$14,887
DNA Repair and Mitochondrial Dysfunction in T Cell Aging	93.855				$153,591
DNA-carbon Assemblies for Multispectral Imaging	93.859				($15)
Do Genotype Patterns Predict Weight Loss Success for Low Carb vs. Low Fat Diets?	93.847				$389
Do Hair Cortisol and Hair Oxytocin Represent the Stressful and Supportive Experiences of Preschool Children?	93.865				$33,209
Dopamine degradation pathway and alpha-synuclein aggregation	93.853			$10,754	$412,224
Dopamine modulation of synaptic plasticity and integration in the striatum	93.853				$195,313
Dual Modality X-ray Luminescence CT for in vivo Cancer Imaging	93.394				$83,320
Dynamic Brain Mechanisms of Proactive and Reactive Control in Childhood ADHD	93.242				$133,774
Dynamic Imaging of EMT in the Breast Cancer Microenvironment	93.396				($24)
Dynamic Mechanisms of Fate Control during Epithelial Organ Renewal NIGMS Administrative Supplements for Equipment NOT-GM-19-013	93.859				$386,156
Dynamic pathways of eukaryotic translation initiation	93.859				$623,759
Dynamic polarity mechanisms controlling stem cell asymmetry during tissue development	93.859				$5,840
Dynamic regulation of whole brain circuit function by basal ganglia pathways	93.853				$555,936
Dynamics of developmental strategies that drive cell identity and plasticity	93.859				$38,109
Dynamics of Translation	93.859				$643,026

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Early Biomarkers in Neonatal Brain Injury	93.853			$12,326	$152,667
Early language processing skill and school-relevant outcomes in emerging Spanish-English bilinguals	93.865				$614,662
E-cigarette aerosol effects on the cardiovascular system in rodents	93.837				$380,414
Economic modeling for prevention of disease	93.084	University of California, San Francisco	8776sc		$5,925
EDAC: ENCODE Data Analysis Center	93.172	University of Massachusetts	WA00665466/OSP2017188 WA00805792/OSP2017188		$89,588
Effect of Blood Transfusion Practices on Cerebral and Somatic Oximetry	93.839			$47,452	$223,190
Effect of Bypass Policies on Stroke Treatment in a National Sample of Medicare Beneficiaries	93.226				$38,917
Effect of Changing NICU patient volumes and levels of care on neonatal outcomes	93.865			$130,723	$287,152
Effect of Microgravity on Drug Responses Using Engineered Heart Tissues	93.350			$99,350	$335,153
Effect of Radiotherapy on Dendritic Cell Subsets: Implications for Immunotherapy	93.396				$291,538
Effects of aging on primary and secondary vaccine responses in a 15-year longitudinal cohort	93.RD				$1,397,588
Effects of Environmental Stimulation and Nurturance on Neural and Endocrine Function in Infants	93.865				$134,551
Effects of FLASH Radiation on Cancer and the Immune Response	93.395				$49,776
Effects of hypertrophic cardiomyopathy (HCM) causing mutations on sequestration of human ß-cardiac myosin via intra-molecular interactions	93.837				$57,598
Effects of IgE Blockade on T Cells in Food Allergy	93.855				$415,488
Effects of maternal immune activation on GABRB3-deficient neocortical progenitors	93.865				$37,530
Effects of Maternal Obesity on Offspring Immune System	93.865				$98,926
Effects of Microenvironmental Stiffness on Epigenetic Regulation	93.398				$67,814
Effects of pregabalin and thrombospondins on enhanced excitatory connectivity, new synapse formation and epileptogenesis after neocortical injury	93.853				$307,942
Effects of sanitation on pathogen transmission and child health in Bangladesh	93.865	University of California, Berkeley	00008599/BB00517723	$67,328	$66,868
Effects of Social Gaze Training on Brain and Behavior in Fragile X Syndrome	93.865				$386,232
Effects of TrkB Activation on Abnormalities in Neocortical FS interneuron	93.853				$331,981
Effects of Western and Mediterranean Diets on Metabolic and Neuropathologic Risk Factors for Alzheimer's Disease in Nonhuman Primates	93.866	Wake Forest University	WFUHS 114989		$136,880
Efficacy of Twice Weekly Hemodialysis in Patients with Residual Kidney Function	93.847	Palo Alto Veterans Institute for Research	SIT003-01		$3,535
Elafin Therapy for Pulmonary Arterial Hypertension	93.838			$608,477	$1,963,638
Electronic Bridge to Mental Health (eBridge) for College Students - Supplement	93.242	University of Michigan	3003236141 Subaward 3004658330		$80,319
Electronic Structure of Heme Enzyme Intermediates from Resonant Inelastic X-ray Scattering and L-Edge X-ray Absorption Spectroscopy	93.859				$56,437
Electrophysiological basis of cortical plasticity in repetitive transcranial magnetic stimulation treatment	93.242				$24,419
ELSI.hub: National Center for ELSI Resources and Analysis	93.172				$2,431
Elucidate the Mechanisms Underlying Inhibition Induced Devaluation	93.279				$35,452
Elucidating Disease Pathogenesis in Autoimmune Polyendocrine Syndrome Type 1	93.855	Cincinnati Children's Hospital Medical Center	140755 PO#3100627514		$98,191
Elucidating Genotype-Phenotype Relationship of Congenital Cardiomyopathies	93.837				$449,110
Elucidating Neuron-Intrinsic Molecular Mechanisms of Optic Nerve Regeneration	93.867				$369,122
Elucidating Novel Mechanisms Underlying Prostate Cancer Development	93.395				$71,185
Elucidating the Function of Inhibitory Brain Circuits Involved in Anxiety	93.242				$50,401
Elucidating the role of nascent RNA in enhancer-promoter communication and three-dimensional genome organization	93.393	Harvard University	152543.5104446.0102 152543.5104446.0202		$232,177
Elucidating the Role of the CLCF1-CNTFR Signaling Axis for Lung Cancer Treatment	93.398				$41,192
Elucidation of the Molecular Mechanisms of Optineurin in Glaucomatous Degeneration	93.867				$10,293
Emotion Dysregulation and Sleep-Time Masticatory Muscle Activity in Sleep Bruxism	93.121				$726,748
Enabling ethical participation in innovative neuroscience on mental illness and addiction: towards a new screening tool enhancing informed consent for transformative research on the human brain	93.242			$15,772	$880,335
Enabling reliable cardiovascular simulations via uncertainty quantification	93.286			$139,227	$397,109
Enabling Technologies for Human-Machine Hybrid Tissues	93.310				$479,815
Endothelial Injury, BMPR2 Dysfunction and Macrophage Activation Cause EndMT and PAH	93.838			$457,589	$981,877
Endothelial Toll-like Receptor 3 in the pathogenesis and therapy of Pulmonary Arterial Hypertension	93.838	Virginia Commonwealth University	FP00007971_SA001		$3,833
Endothelial-pericyte interactions in the pathogenesis of pulmonary arterial hypertension	93.838				$603,881
Endovascular Interventional MRI: Optimizing Tools and Techniques at 3T	93.286	University of California, San Francisco	11070sc		$68,637
Engaging self-regulation targets to understand the mechanisms of behavior change and improve mood and weight outcomes	93.837	University of Illinois at Chicago	5UH2HL132368-03: SUB# 7845-06 Subaward 17357-00		$402,732
Engineered biomaterials to modulate cell-cell signaling for the robust expansion of stem cells	93.286				$33,271
Engineered matrix microarrays to enhance the regenerative potential of iPSC-derived endothelial Cells	93.837				$385,353
Engineered Protein Hydrogels to Modulate Adipose-derived Stromal Cell Secretome and Exosomes for Injectable Myocardial Infarction Therapy	93.837				$173,596
Engineering a multispecific receptor antagonist to inhibit cancer metastasis	93.395				($239)
Engineering Cytoskeletal Motors	93.859			$48,902	$302,306
Engineering High Reliability Learning Lab (EHRLL)	93.226	Harvard University	115380-5109892		$62,881
Engineering of macrophage phagocytosis for cancer and stem cell immunotherapy	93.395				$222,665

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Engineering Yeast for High Titer Production of Monoterpene Indole Alkaloid Natural Products	93.213	University of California, Los Angeles	0130 G WA210		$105,396
Enhanced Bone Healing Around Implants by Transplanted NF-kB Driven Immunomodulating MSCs	93.846				$291,975
Enhanced Clinical Diagnosis of Early Osteoarthritis	93.846				($14)
Enhanced Stem Cell Therapy with Rehabilitation Strategies for Peripheral Nerve Regeneration	93.865				$26,390
Enhancement of Natural Killer Cell Effector Functions	93.393				$3,105
Enhancer evolution and the origins of vertebrate brain development	93.853				$62,958
Enhancing Cancer Immunotherapy: Targeting the Tumor and Targeting the Host	93.395				$1,028,656
Enhancing potency and durability of immunotherapies for neuroblastoma	93.395	Children's Hospital Los Angeles	RGF011027-B		$208,754
ENIGMA World Aging Center	93.866	University of Southern California	109720643 / PO# 50731238		$39,814
Ensemble neural dynamics in the medial prefrontal cortex underlying cognitive flexibility and reinforcement learning	93.853				$138,490
Environmental Arsenic Exposure, Microbiome, and Human Health	93.113				$94,853
Environmental, Social and Biological Factors and Disparities in Preterm Birth	93.113	University of California, San Francisco	10697sc		$10,180
Enzyme and Pathway Engineering for in vivo Production of Anticancer Noscapine Derivatives	93.213				$60,232
Epidemiology and management of chronic kidney disease in South Asians	93.847			$25,650	$193,912
Epidermal Signaling Regulators	93.846				$247,761
Epigenetic landscapes and regulatory divergence of human craniofacial traits	93.121			$318,811	$547,316
Epigenetic Mechanisms and Targeting in MLL Leukemia	93.396				$311,505
Epigenetic Regulation of Longevity in Response to Environmental Signals	93.866				$21,427
Epigenetic Regulation of PDE Signaling in Dilated Cardiomyopathy	93.837				$66,026
Epigenetic, Transcriptional, and Microenvironmental Determinants of Human HSC Self-Renewal	93.839				$396,622
Epigenetics in the extreme -investigating heritability driven by disordered RNA binding proteins in development and cancer	93.859				$81,259
Epilepsy Training Grant	93.853				$176,469
Escalating Proportion of Weight-Loss Maintainers Via Modules Prior to Weight Loss	93.837			$19,936	$648,166
Establishing a task-evoked magnetic resonance spectroscopy approach for testing the GABA deficit Hypothosis in Schizophrenia	93.242	Palo Alto Veterans Institute for Research	YOJ0009-01		$32,055
Estrogen reverses progestin-mediated loss of genital mucosal barrier function	93.865			$192,161	$594,836
Ethanol and aldehyde dehydrogenases in health and disease	93.273				$329,656
Ethical challenges of whole genome sequencing in care of critically ill children	93.172				$227,891
Ethics of Inclusion: Diversity in Precision Medicine Research	93.172			$51,681	$71,938
Eunice Kennedy Shriver NICHD Cooperative Multicenter Neonatal Research Network	93.865				$289,144
Evaluating GWAS AMD Candidate Loci by Gene Editing in Human iPS Cells	93.866			$33,364	($527)
Evaluating health and economic effects of targeted strategies in TB/HIV	93.855	Yale University	GR101920 (CON-80001107)		$47,051
Evaluating the Effectiveness of an Online Small-Group Self-Management Workshop for Rural Caregivers of Individuals with Alzheimer's Disease and Related	93.866	University of California, San Francisco	10987sc		$50,084
Evaluating the potential of human induced pluripotent stem cells (hiPSC) for cartilage repair.	93.846				$431,627
Evaluating the Role of 24-hour Urine Testing in Urinary Stone Disease	93.847				$60,667
Evaluating the role of allergen dose and duration in the safety and efficacy of multiallergen oral immunotherapy with Omalizumab	93.855				$249,361
Evaluation of genetic, clinical and environmental risk factors to establish effective screening strategies for second primary lung cancer	93.393			$132,306	$573,073
Evaluation of Machine Learning to Mobilize Detection and Therapy of Developmental Delay in Children	93.865				$149,600
Evidence Based Evaluation and Acceptance of Donor Hearts for Transplantation	93.837			$281,958	$425,186
Evolution of drug resistance in Candida glabrata	93.855			$13,352	$187,757
Examination of the molecular features and function of the hair cell-synaptic complex in the spontaneously and Atoh1-enhanced regenerating adult mouse utricle	93.173				$42,062
Executive Function in Preschoolers: Characteristics and Response to Treatment	93.865				($675)
Exome sequencing in Diverse Populations in Colorado & Oregon	93.RD	Kaiser Permanente	OOS030229-Stanford		$10,229
Exosomes and the Immune Response in Allograft Outcomes in Pediatric Transplant Recipients	93.855				$389,106
Exploring a promising design for the next generation time-of-flight PET detector	93.394			$42,438	$414,105
Exploring Multiple Environmental Exposures in Combination as Risk Factors for Adverse Pregnancy Outcomes	93.865				$53,152
Exploring Novel Epilepsy Pathways	93.853	University of Iowa	1001876082		$11,515
Exploring thalamocortical neural state space for adaptive closed-loop deep brain stimulation of epileptic networks.	93.853				$38,651
Exploring the mitochondrial function of TSEN in neuronal development and maintenance	93.242				($344)
Extended DNA synthesis using a library-based CRISPR/Cas9-engineered enzyme	93.172				$146,380
Extracellular vesicles, small RNAs, and intercellular communication in Entamoeba histolytica	93.855				$155,572
Failure to rescue in frail surgical patients	93.866				$86,519
Family-building After Cancer: Preferences, Decisions, and Planning for Young Female Survivors	93.398				$54,862
Fear learning in adolescents with chronic pain: Neural and behavioral mechanisms	93.865			$27,213	$580,800
Feasibility of in-home semen testing in a North American preconception cohort study	93.865	Boston University	4500002549		$38,478
Feasibility Study of New Method of Diagnostic and Prediction of Painful CIPN	93.394	LASMED, LLC	1R43CA20676901A1		($17,125)

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Fibroblast lineage mechanisms of scarless skin healing	93.859				$208,445
Final Clinical Studies for Submission of a Pre-Market Approval Application to the FDA for a Bionic Pancreas that Automates Type 1 Diabetes Management	93.847	Boston University	4500002011		$275,650
Fitness Effects of Beneficial Mutations	93.859				$96,883
Fitness for Use of Electronic Health Records as Source Data for Clinical Research	93.RD	Duke Clinical Research Institute	EPM-6971		$36,385
fMRI of Emotion Regulation Mechanisms in CBT vs. MBSR for Social Anxiety Disorder	93.242				($2,418)
fMRI-Based Biomarkers for Multiple Components of Pain	93.279	University of Colorado, Boulder	1550989 & PO#1000292326		$64,326
Focal Sustained Release Chemotherapy-Loaded Biomaterials at Tumor Sites	93.853	Tufts University	HH4218; PO# EP0173100		$199,410
Folding@Home: Simulating Folding on the Millisecond to Second Timescale	93.859				$288,169
Forecasting tumor evolution: Can the past reveal the future?	93.310				$414,918
Forming science-industry partnerships to link everyday behaviors to well-being	93.866			$10,515	$180,928
Foundations of MRI Cartigraphy for Mesoscale Organization and Neuronal Circuitry	93.242	University of California, Berkeley	00009347/PO#:BB00836520		$143,784
Foundations of MRI Corticography for mesoscale organization and neuronal	93.242	University of California, Berkeley	000009346/PO# BB00840113		$178,933
From Enrichment to Insights	93.879				$723,206
From structure to therapy: the TRiC Chaperonin network in Huntington's disease	93.853	University of California, Irvine	1206439-1-GALLC 2016-3341 2017-3505		$409,315
Function and circuitry of adaptive inhibition in the retina	93.867				$208,597
Function of LOXHD1 in mechanosensory hair cells	93.173				$413,893
Function of MEF2 in Neuroprotection and Neuro-regeneration Following Stroke	93.867				$364,509
Function of Neurexins	93.242				$593,348
Function of PHD Domain Proteins in Chromatin Regulation	93.859				$560,413
FUNCTIONAL ANALYSIS OF PATHOGENIC AND PROTECTIVE PEANUT ALLERGEN-SPECIFIC HUMAN ANTIBODIES	93.855				$464,346
Functional and Translational Epigenomics of Acute Lymphoblastic Leukemia	93.393				$268,217
Functional Characterization of the Alzheimer's Disease Epigenome	93.866				$110,748
Functional compartmentalization of hedgehog signal transduction in primary cilia	93.859				$180,083
Functional genetics of human innate immunity in the bimodal gamma delta T cell response to Epstein-Barr Virus and in education of NK cells and their re-education to respond to autologous cells	93.855				$142,142
Functional heterogeneity of Hypocretin neurons	93.242				$438,177
Functional organization of neural circuits underlying movement control	93.853				($12)
Functional Proteomic Analysis and Biomarker Identification in a Novel Mouse Model of Metastatic Hepatocellular Carcinoma (HCC)	93.398				$204,918
Functional-Neuroanatomy of High-Level Visual Cortex: A Quantitative Multimodal Approach	93.867				$254,665
Fundamental Studies of RNA Conformational Thermodynamics	93.859				$72,595
Fundamental Studies of RNA Folding	93.859			$237,058	$734,855
G Protein Coupled Receptor Structure, Dynamics and Signaling	93.853				$569,835
GABA Driven Depolarization in Early Human Cortical Development	93.853				$146,743
GABAergic Neurophysiology in Autism Spectrum Disorder	93.242				$142,975
GABRB3 and Placental Vulnerability in ASD	93.242				($10)
Gaining insight into psychiatric disease by engineering piece by piece the human brain in vitro.	93.242				$530,693
Gene Expression Analyses of the Human Microbiome During Pregnancy through Metatransciptomics	93.865				$121,436
Gene expression profiling of IPSC derived neurons in Autism Spectrum Disorder	93.242			$261,165	$713,389
Gene Networks Influencing Psychotic Dysconnectivity in African Americans	93.242	Boston Children's Hospital	GENFD0001624607		$16,197
Gene Networks Influencing Psychotic Dysconnectivity in African Americans	93.242	Yale University	GK000076 (CON-80000352) GK000704 (CON-80000647))		$19,717
Gene Ontology Consortium	93.172	University of Southern California	101524296 PO#50659816		$548,204
Gene Regulation as a Foundation for Autoimmune Disease Prevention	93.855	Cincinnati Children's Hospital Medical Center	1028109-100-EALDU 304790 PO#3100606276		$81,926
Gene Regulation During Early Development c.Elegans	93.859				$392,844
Gene Silencing and Gene Editing in Phototransduction	93.867	Columbia University	2(GG012115-01)		$55,000
Generation of highly selective activity based probes using chemically modified phage	93.286				$545,743
Genes, cells, and pathways that regulate urochordate allogeneic stem cell competition and their mammalian homologues	93.859				$393,185
Genetic and Biochemical Interrogation of Rotavirus-Cohesin Interaction	93.855				$95,991
Genetic and cellular analysis of glial development and function in vertebrates	93.853				$390,390
Genetic and Immunologic etiology of chronic recurrent multifocal osteomyelitis (CRMO)	93.846	University of Iowa	1001938923		$26,216
Genetic and Molecular Dissection of Pulmonary Neuroendocrine (NE) Cell Development	93.838				$155,743
Genetic and Physical Basis of Mechanical Neuroprotection	93.853				$95,735
Genetic and Stem Cell Model of Cardiac Metabolic Disease	93.837				$132,874
Genetic Control of Neural Stem Cell Homeostasis	93.853				$394,204
Genetic Disorder of Mucociliary Clearance	93.RD	The University of North Carolina at Chapel Hill	5111620		$24,075
Genetic Mechanisms of Congenital Heart Disease	93.837				$300,193
Genetic Mechanisms of Myelination in Zebrafish	93.853				$130,477
Genetic Predictors of Ameloblastoma Behavior	93.121			$29,537	$502,970
Genetic Recombination in C. elegans	93.859				$104,607
Genetic Regulation of Cochlear Development	93.173	Baylor College of Medicine	700000816		$32,412
Genetic Regulation of Gene Expression and its Impact on Phenotypes Supplement	93.310				($8,286)
Genetic risks for cardiovascular events in ESRD patients from the EVOLVE study	93.847	Indiana University	IN-4687724-STAN, PO# 1543801		($18,764)

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Genetic testing, treatment use, and mortality after diagnosis of breast and ovarian cancer: The Georgia-California GeneLINK Initiative	93.393			$347,009	$427,850
Genetic variation, stress, and functional outcomes after stroke rehabilitation	93.361	University of California, Irvine	2018-3657		$4,855
Genetically encoded photoswitchable antibody mimetic proteins for spatiotemporal control of molecular recognition	93.859				$14,406
Genetics and Developmental Biology Training Program	93.859				$565,651
Genetics of Hypoplastic Left Heart Syndrome and Aortic Valve Disease	93.RD	J. David Gladstone Institutes	R02177-B		$58,479
Genetics of Prostate Cancer in Africa	93.393	Dana-Farber Cancer Institute (489)	1242104 1242103-3	$103,225	$220,587
Genetics of Severe Mental Illness	93.242	University of California, Los Angeles	2000 G VF036		$22,672
Genome Editing by Homologous Recombination to Create HIV Resistant Immune System	93.855				$471,645
Genome Editing of Human iPSCs to Study Inherited Hypertrophic Cardiomyopathy	93.837				$9,587
Genome Editing to rescue FOXP3 Deficiency in IPEX syndrome	93.855				$24,466
Genome Wide Association Study (GWAS) in Hepatocellular Carcinoma (HCC)	93.393	University of Texas MD Anderson Cancer Center	3001216081		$12,434
Genome wide identification and functional analysis of chromatin regulatory RNAs	93.172				$796,645
Genome-Wide Association Study of Mammographic Density	93.393	Mt. Sinai School of Medicine	0255-1251-4609		$25,724
Genomic and Cellular Variation from Single Molecules and Cells	93.172	University Of Pennsylvania	P.O. #3996602 572789 PO 4191700		$159,153
Genomic and epigenomic effects of large CNV in neurons from iPSC	93.242				($2,236)
Genomic and Morphologic Predictor of High-Risk DCIS	93.393			$107,255	$728,578
Genomic and synthetic biology tools for expressing natural product gene clusters	93.859			$371,163	$1,394,426
Genomic Database for Candida Albicans	93.121				$410,819
Genomic Evolution of Breast Cancer	93.393			$9,409	$387,588
Genomic mosaicism in developing human brain	93.242	Yale University	GK000029(CON-80000297)		$4,127
Genomic Resource for the Yeast Saccharomyces	93.172			$267,002	$2,905,542
Genomics of Gene Regulation in Progenitor to Differentiated Keratinocytes	93.172				$26
Genomics of rapid adaptation in the lab and in the wild	93.859				$961,362
Germline and Tumor Genomic Analyses of Breast Cancer in Latinas	93.393	Beckman Research Institute Of The City Of Hope	PO#3000125989		$10,252
Get moving, GET living: Graded exposure treatment for adolescents with chronic musculoskeletal pain.	93.846				$188,547
Giant MagnetoResistive (GMR) Sensors for Measuring Influenza Vaccine	93.855				$1,064,927
Glioma Circuitry: Bridging Systems Neuroscience and Cancer	93.310				$1,020,168
Global Health Fellows and Scholars Research Training - Mentoring Fellowship Supplement	93.989	University of California, Berkeley	1004516-100-EAFTR		$9,205
Global Health Fellows and Scholars Research Training - Mentoring Fellowship Supplement	93.RD	University of California, Berkeley	Subaward 00009518 BB01006362	$64,004	$101,509
Glycine receptor synaptic plasticity	93.853				$271,043
Glycosylation and Immune Evasion in Urologic Tumors	93.394				$89,946
Goal of Open Lung Ventilation in Donors	93.838	Vanderbilt University Medical Center	VUMC44300 / R01HL126176 VUMC 44300		$21,674
Graduate Training in Stem Cell Biology and Regenerative Medicine	93.859				$377,039
Graduate Training Program in Biotechnology	93.859				$262,854
Guanidinium Toxins as Molecular Probes for NaV Study	93.859				$340,251
Harnessing human dendritic cell subsets for the design of novel immunotherapies	93.310				$348,967
Harnessing Mindset in 21st Century Healthcare	93.213				$410,634
Harnessing the innate immunotransmitter cGAMP for anti-cancer therapy	93.398				$19,002
Harnessing the Unique Biogenesis of the Apicomplexan plastid organelle for Antimalarial Targets	93.855				$61,214
HEAL Study (High-dose Erythropoietin for Asphyxia and Encephalopathy)	93.853	University of California, San Francisco	9681sc		$28,730
HEAL-EEG - Neurophysiologic measures of Epo treatment for hypoxic-ischemic encephalopathy (HIE)	93.853	University of California, San Francisco	11027sc		$13,945
HEAL-EEG-Neurophysiologic measures of Epo treatment for hypoxic-ischemic encephalopathy (HIE)	93.853	University of California, San Francisco	11099sc		$52,771
Hedgehog signaling in taste cell maintenance and regeneration	93.173				$365,517
Hemophilia Treatment Centers (SPRANS)	93.110	Center for Inherited Blood Disorders (CIBD)	CIBDIX2012HRSA-STAN-5, -STAN-07, -STAN-08		$35,007
Heparanase and Regulatory T cell Stability and Function	93.855				$210,388
Hepatic Gene Transfer for Treatment of Hemophilias A & B	93.839				$520,969
HER2-targeted exosomal delivery of therapeutic mRNA for enzyme pro-drug therapy	93.310				$265,327
HIF-1 mediated vascular integrity limits Aspergillus invasion in airway rejection	93.838				$160,711
High dose efficiency CT System	93.286			$344,510	$449,143
High Performance Scintillator for Radioluminescence Microscopy	93.859	Radiation Monitoring Devices, Inc.	Contract C16-32		($2,649)
High resolution imaging of genome structure and gene regulation in development	93.859				$248,018
High School Program in Biomedical and Health Sciences	93.847				$174,107
High Sensitivity Flow Imaging of the Human Placenta with Coherence-Based Doppler Ultrasound	93.865			$65,476	$500,419
High Sensitivity Molecular Ultrasound Imaging in Pancreatic Cancer	93.286				($7,988)
High throughput screening to identify compounds against Entamoeba cysts	93.855				$91,786
High Value Healthcare Collaborative: Engaging Patients to Meet the Triple Aim	93.172	University of Iowa	PO # 1001701389		($488)
High-Bandwidth Wireless Interface for Continuous Human Intracortical Recording	93.853	Massachusetts General Hospital	227057		$89,601
High-end X-ray Detector System for Femtosecond Crystallography	93.351				$690,400
Highly Reactive Hydrazone Chemistry: Orthogonal Modification in Cellular Contexts	93.859			$15,559	$49,597
High-Resolution Imaging of Hippocampal Mechanisms in Age-Related Memory Decline	93.866				$330,776
High-resolution modeling of protein-RNA interfaces	93.859	The Fred Hutchinson Cancer Research Center	920028		$317,355

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High-throughput dissection of HIV RNA ligand affinity and specificity	93.859	University of Michigan	Sub3004919095,P.O.3005271391		$98,360
High-throughput nano-electrode array system for cardiac safety assessment	93.286	Cyion Technologies	CT2017-002		$48,622
High-throughput precision genome editing to characterize natural genetic variants	93.859				$21,151
High-throughput radionuclide counting and sorting of single cells	93.396				$54,913
High-Throughput Screens to Discover Novel Inhibitors of Leaky RyR2 for Heart Failure Therapy	93.837	University Of Minnesota	N006353702		$256,723
High-throughput systematic characterization of regulatory element function	93.172				$1,459,051
HIPC: System Biological Analyses of Innate and Adaptive Responses to Vaccination - Core A	93.855	Emory University	A016254A198103		$206,176
HIPC: System Biological Analyses of Innate and Adaptive Responses to Vaccination-Proj#1	93.855	Emory University	A016268 A198127		$1,591,251
hiPSC-Cardiomyocytes to Screen Variants Predictive of Doxorubicin Cardiotoxicity	93.837			$157,267	$469,958
Hi-resolution dynamic imaging of chromosomes in single cells by combined CRISPR imaging and sequential FISH	93.310	California Institute of Technology	S386839 / U01 DA047732		$197,850
HIV Drug Resistance Database	93.855				$752,669
HIV latency reversal through novel, potent PKC modulators	93.855	University of California, Los Angeles	2301 G UC641		$217,209
HIV Resistance Testing Using Point-of-Care Dynamic Solid-Phase Melt Analysis	93.855				$233,547
HIV Vpr, CRL4.DCAF1 E3 ligase and their targets	93.859	Case Western Reserve University	RES512573		$6,579
Home Use of MD-Logic Automated Insulin Delivery System: Safety and Efficacy	93.847	HealthPartners Institute	852223-Stanford X1509000-Stanford		$15,060
Homologous Recombination Mediated Gene Correction for the Hemoglobinopathies	93.839				$484,551
Hospital Variation in Costs and Outcomes of Care for Childbirth	93.226	Yale University	GK000663 (CON-80000411)		$29,522
Host Determinants of Adeno-Associated Virus Entry and Trafficking	93.855				$455,095
Host Genes Critical for Flavivirus Infection	93.855				$305,376
Host-virus interactions in the control of the filovirus entry	93.RD	Albert Einstein College of Medicine	P0 706802		$18,581
How is anxiety-related information relayed across hippocampal-prefrontal circuits	93.242	University of California, San Francisco	10948sc		$107,714
How Social Behavior Changes The Brain	93.853				$23,290
Human Connectome Mapping Using Ultra-High-Resolution MRI: A Technological Pathway	93.286				$39,090
Human Induced Pluripotent Stem Cells for Cardiovascular Disease Modeling	93.837				$529,248
Human Infrared Vision at Molecular and Cellular Scale	93.853				$822,002
Human Population Diversity in Leukocyte Receptors	93.855			$21,684	$403,626
Human Tumor Atlas Network: Data Coordinating Center	93.353	Dana-Farber Cancer Institute (489)	1288401		$5,273
Hydrocortisone for BPD Respiratory and Development Outcomes Study (HYBRID Outcomes Study): Clinical Coordinating Center	93.838	Children's Hospital of Philadelphia	3200930818,PO962765-RSUB 3200930819;PO20022092-RSUB		$19,738
Hydrogels with Controlled Degradation and Stress Relaxation for Engineered Cartilage	93.846				$211,674
Hyposalivation and the Human Oral Microbiome	93.121	Palo Alto Veterans Institute for Research	REL0027-02		$43,341
Hypoxia induces SHMT2 to regulate cellular redox and epigenetics	93.396				$278,940
Ictogenesis in a model of temporal lobe epilepsy	93.853				$363,254
Identification and characterization of natural products from the human microbiota	93.847				$287,583
Identification and characterization of oxygen-sensing neurons in the lung	93.838				$36,370
Identification of a novel pathway that regulates optic nerve myelination and remyelination	93.867				$90,614
Identification of cancer stem cell therapeutic targets	93.396				($185)
Identification of causal coronary heart disease variation in smooth muscle cells	93.837				$259,433
Identification of cells and signaling mechanisms underlying opioid analgesia and side effects	93.279				$546,321
Identification of Cooperative Genetic Alterations in the Pathogenesis of Oral Cancer	93.121				$420,341
Identification of RDoC Social Communication Sub-Constructs Using Existing Datasets	93.242				$76,126
Identification of therapeutic target miRNAs involved in altered calcium handling in familial dilated cardiomyopathy	93.837				$4,920
Identification, standardization and dissemination of the HIPC immune signatures	93.855	Icahn School of Medicine at Mount Sinai	0255-8673-4609-1		$62,800
Identifying a Systemic Immune Signature of Periodontal Disease with Mass Cytometry	93.121				$191,252
Identifying causal dynamical motifs of anhedonia with circuit-level tools	93.242				$601,721
Identifying Components of the Rhoptry Protein Injection Machinery Toxoplasma gondii	93.855				$30,226
Identifying critical erythrocyte host factors for Plasmodium falciparum malaria	93.839				$460,948
Identifying Markers of Induced Pluripotent Stem Cell-Derived Cardiomyocyte (iPSC-CM) Maturity	93.837				$35,999
Identifying niche factors regulating distinct properties of AT2 stem cells	93.838				$562,634
Identifying Patterns of Cognitive, Motor, and Brain Structural Abnormalities Differentiating Alcohol Use Disorder with and without HIV Infection Comorbidity	93.273				$66,950
Identifying the gene networks of insulin resistance: the GENESIPS study	93.837				$1,177
Identifying the Genetic Etiology of Neuropathology for Alzheimer Disease and Related Dementias	93.866	University of Miami	SPC-001127		$8,852
Identifying the Human Calcineurin Signaling Network	93.859				$517,062
Identifying the human skeletal stem cell	93.121				$338,709
Identifying The Machinery That Translocates Toxoplasma Effectors Into The Host Cell	93.855				$439,095
Image-guided ultrasound therapy and drug delivery in pancreatic cancer	93.394			$77,587	$623,179
Imaging and circulating DNA markers to assess early response and predict treatment failure patterns in lung cancer	93.394				$157,011

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Imaging and Regulation of Immune Function in HCT	93.394				$405,959
Imaging Brain Metabolism Using MRS of Hyperpolarized 13C-Pyruvate	93.286				$429,838
Imaging Collaterals in Acute Stroke (iCAS)	93.853				$578,247
Imaging of mitochondrial function of progenitor cells transplanted to the ischemic myocardium	93.837	Mayo Clinic	STA-213113-04; PO# 66647785		$55,137
Imaging the behaviorally evoked neural ensemble dynamics of the locus coeruleus in healthy and addicted brains	93.279				$53,969
Imaging the temperature sensing circuits in the spinal cord	93.853				$266,410
Immune Checkpoint inhibitors as Antifibrotic Therapy for Idiopathic Pulmonary Fibrosis	93.838				$163,954
Immune Monitoring and Analysis of Cancer at Stanford (IMACS)	93.353				$2,586,938
Immune profiling of saliva in pancreatic diseases	93.847	Mayo Clinic Hospital-Rochester	BOA-229500/PO #66251884		$21,128
Immune targeting of Non-Hodgkin Lymphoma through integrative Antigen Presentation Profiling	93.398				$187,526
Immune Tolerance Network	93.855	Benaroya Research Institute at Virginia Mason	FY19ITN257 FY18ITN257 FY17ITN006 FY18ITN006		$2,182
Immunization against filamentous bacteriophages to prevent bacterial infection	93.855	University of Montana	PG18-61062-02		$211,542
Immunogenetic Determinants of Disease Risk in Neurological Disease	93.853	University of California, San Francisco	9047sc		$374,415
Impact and outcomes of cataract surgery among patients with Alzheimer's Disease	93.866				$93,617
Impact of Affect Reactivity and Regulation on Breast Cancer Treatment Decisions	93.393				$636,903
Impact of Diet on Intestinal Microbiota-Host Dynamics	93.847				$455,476
Impact of HIV exposure, feeding status, and microbiome on immune ontogeny and vaccine responses in infants	93.855			$221,353	$384,051
Impact of Recurrent Seizures upon Myelin Structure and Function	93.853	Kennedy Krieger Institute	1K12NS098482-02		$160,288
Impact of Retail Tobacco Advertising on Youth Smoking	93.393			$33,807	$202,381
Impact of sleep-wake circuits on cortical synapse plasticity during motor learning	93.853			$105,905	$503,728
Impact of standardized communication on human performance during resuscitation	93.226				$134,036
Implementation of evidence-based treatment for on-campus eating disorders	93.242	Washington University	WU-12-284-MOD-9/PO # 2917864T		$33,448
Improve PAD PERformance with METformin: The PERMET Trial	93.837	Northwestern University	60045563 SU 60045563SU / R01HL131771		$18,830
Improving Cognition via Exercise in Schizophrenia	93.242	Icahn School of Medicine at Mount Sinai	0255-3351-4609		$142,147
Improving Quality of postoperative pain care through innovative use of electronic health records	93.226				$198,583
Improving the Efficiency and Rigor of Pharmacovigilance at FDA	93.RD				$11,913
Improving Tissue Engineered Vascular Graft Performance via Computational Modeling	93.837	The Research Institute at Nationwide Children's Hospital	700151-1118-00; PO4601124-0-46 700151-0219-00		$238,535
In Situ Bioconjugation as a Therapeutic Delivery Modality to Enhance Ocular Wound Healing	93.867				$253,759
In situ simulation of neonatal resuscitation to improve team performance and clinical outcomes	93.865			$13,155	$459,188
In Vivo Control and Functional Visualization of Stem Cell-Driven CNS Regeneration	93.310				$132
In vivo PET imaging of novel engineered AAVs informs capsid design	93.RD				$40,699
In Vivo Polarity Establishment and Symmetry Breaking in an Epithelial Tissue	93.859				$33,151
In vivo targeting of diabetes-relevant human cell types with rAAV vectors	93.847	Oregon Health & Science University	1005254_STANFORD		$255,994
INCLUDE19-Human iPSC Model for Elucidating Crosstalk Signaling and Secretomes: Down Syndrome Administrative Supplement	93.837				$628,784
IND-enabling studies on novel Cav3 T-channel modulators for treatment of neuropathic pain	93.853	Afasci Inc.	130486		$53,378
Induced host immune response to HIV-1 after antibody therapy	93.855				$126,036
Induced neuronal cells: A novel tool to study neuropsychiatric diseases	93.242				$619,325
Infant Aphakia Treatment Study-Chairman's Grant	93.867				$147,422
Infectious Diseases, Technology and Mortality Convergence	93.865				($2)
Inferring the roots of metastases and their effects on patient survival	93.398				$134,283
Influence of genetic risk factors on biomarkers and cognitive decline in preclinical AD	93.866				$155,407
Influenza responses and repertoire in vaccination, infection and tonsil organoids	93.855			$1,013,809	$4,245,070
Informatics Tools For Optimized Imaging Biomarkers For Cancer Research & Discovery	93.394	Massachusetts General Hospital	224943		$140,773
Inhibitory Controls in the Thalamic Neurons	93.853				$585,955
Inhibitory synaptic transmission, stress, and drugs of abuse	93.279				$51,966
Initiate and Maintain Physical Activity in Clinics: The IMPACT Diabetes Study	93.847			$57,264	$787,737
Injectable Hydrogels to Improve the Efficacy of iPSC-derived Therapies	93.286			$4,061	$4,061
Injectable Hydrogels to Protect Transplanted Cells from Hypoxia	93.286				$127,664
Injectable Macroporous Matrices to Enhance Stem Cell Survival and Craniofacial Repair	93.121				$17,907
Innovating Yeast and Human Genetics Approaches to Define Mechanisms of Neurodegenerative Disease	93.853				$744,130
Innovations in an Aging Society	93.RD	National Bureau of Economic Research	33-4051-Stanford		$20,001
Innovative Physical Activity Interventions for Overweight Latinos	93.847				$15,072
Insights into immune-related disease born from population genomics	93.855			$44,947	$717,798
Insonation of ultrasound microbubbles at low frequency to enhance image-guided therapy	93.394				$418,746
Instant Stem Cell Labeling with a new Microfluidic Device	93.846				$1,622
Institutional Training Grant in Genome Science	93.172				$1,335,170
Instructive Signals for Motor Learning	93.853				$524,226

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Insulin Resistance and Accelerated Cognitive Aging	93.866			$69,121	$635,041
Integral determination of pre and post treatment of EBV DNA in EBV+ nasopharyngeal carcinoma for risk group stratification for RTOG 1305	93.RD	Radiation Therapy Oncology Group	RTOG - STANFORD - SOW#1		$227,057
Integrated Clinical and Transcriptomic Profiling to Characterize Disease Phenotype	93.172				$180,850
Integrated genomic analysis and multi-scale modeling of therapeutic resistance	93.395			$36,208	$549,505
Integrated Genomic and Functional Studies of Immunotherapy for Multi-Food Allergy	93.855				$825,823
Integrated Instrument for non-natural aptamer generation	93.859				$295,301
Integrated Microbial Screening and Antimicrobial Susceptibility Test on Microfluidic Digital Array for Diagnosis of Urinary Tract Infections	93.855	COMBiNATi	1 R41 AI145604-01		$17,996
Integrated Personalized Epigenome Profiling and the Effect of Dietary Exposure on Individuals at Risk for Type-2-Diabetes	93.847				$3,328
Integrated Systemic and Adipose Depot-Specific Regulation of Adipogenesis	93.847				$45,194
Integrated, cell type specific functional genomics analyses of regulatory sequence elements and their dynamic interaction networks in neuropsychiatric brain tissues	93.242				$178,885
Integrating Combined Therapies for Persons with Co-occurring Disorders	93.273				($12)
Integrating Ethics into Machine Learning for Precision Medicine	93.172				$20,037
Integrating literature and experimental data for druggability methods	93.879				$468
Integrating Technology and Context into Research Ethics Education in ACME	93.989			$102,000	$129,723
Integrating the Exposome into Longitudinal Multiomics Profiling	93.113				$97,330
Integration of Diffusion MRI Fiber Tracking and CLARITY 3D Histology for Improved Neurosurgical Targeting	93.853				$296,096
Integration of functional data and GWAS to elucidate genetic basis of diseases	93.172			$685,159	$835,452
Integration of Microbe and Host Data for Diagnosis of Febrile Illness	93.855	Columbia University	2(GG008377-39)		$425,303
Integration of regulatory networks and subcellular architecture to control the Caulobacter cell cycle	93.859				$645,278
Integrative approaches to elucidate p53 transcriptional networks during carcinogenesis	93.393				$952,075
Integrative genomics for risk of CHD and related phenotypes in the Womens Health Initiative	93.RD				($733)
Integrative Molecular and Phenotype Analysis of 22q11.2 Deletion Syndrome	93.242			$55,899	$62,397
Integrative multi-omics in whole genome studies of HLBS disorders	93.837				$338,506
Integrative Omics as a Discovery Tool for Pulmonary Hypertension	93.837			$211,678	$440,915
Interaction of Visual and Oculomotor Signals in Cortex	93.867				$445,783
Interactions between goals, attention, and memory in younger and older adults	93.866				$55,143
Interactions of PTH and Wnt Signaling in Bone Formation	93.846				$75,992
Interdisciplinary Research Training in Pain and Substance Use Disorders	93.279				$357,329
Internal Tissue Mechanics and the Sense of Touch in C. elegans	93.853				$42,854
International Research Collaboration on Neuroimaging Studies of Alcoholism	93.273			$24,120	$290,744
Interneuron-Based Mechanisms of Temporal Lobe Epilepsy	93.853				$236,676
Interpregnancy Intervals and Pregnancy Outcomes in California	93.865				$117,172
Interrogation of individual cells to identify progenitors and their niches	93.837				($67)
Interrogation of individual cells to identify progenitors cells and their niches	93.837				($267)
Interrogation of network-wide neuronal dynamics during fear memory in mouse default mode network	93.242				$105,432
Interrogation of the ISC Niche in Regenerative Medicine	93.847				$449,312
Interrogation of voltage gated sodium channel specialization using synthetic saxitoxin	93.853				$231,290
Interventions in Math Learning Disabilities: Cognitive and Neural Correlates	93.865				$404,087
Intestinal Stem Cell Culture and Entero-Endocrine Lineage Development.	93.RD	University of California, Los Angeles	1646 G UA236		$10,000
Intracellular Calcium Signaling	93.859				$96,422
Intracellular Transport: The Mannose Phosphate Receptor	93.847				$264,785
Intracranial EEG and Electrical Stimulation of Deactivations in the Human Brain	93.865				$29,922
Intranasal vasopressin treatment in children with autism	93.865				$634,806
Intra-procedure Deformable Ultrasound-MRI Fusion for Prostate Biopsies	93.394	Eigen	SPO123219		$7,498
Investigating a fluorogenic DMN-trehalose conjugate as a novel detection tool for Mycobacterium tuberculosis	93.855				$21,558
Investigating how signaling via adhesion GPCR Latrophilins regulates synapse formation and specificity in the hippocampus	93.242				$126,086
Investigating the Hypocretin to VTA Circuit in Memory Consolidation during Sleep	93.242				$59,450
Investigating the neural mechanism of essential tremor using a novel mouse model	93.853				$123,811
Investigating the physical mechanisms that drive multicellular lumen morphogenesis	93.859				$55,902
Investigating the Role of Dach1 in Artery Specification and Collateral Artery Development	93.837				$11,569
Investigating the Role of Metabolic Reprogramming in Cancer Cell Death Sensitivity	93.393				$36,865
Investigating the role of TCF4 in human interneuron function and dysfunction	93.242				$24,992
Investigating the Role of the Mek5-Erk5 Kinase Module in Small Cell Lung Cancer	93.398				$7,451
Investigation of the role of Turner syndrome on approximate number sense	93.865				$116,952
Investigations of racial and geographic disparities experienced throughout work life: Evidence from a longitudinal occupational cohort study	93.866			$307,445	$837,481
Involving older adults in decision making for skin cancer	93.866				$94,247
Ion Channels and Signaling Mechanisms in T Lymphocytes	93.859				$458,623
Iron as an Imaging Biomarker for Inflammation in AD	93.866				$256,130
Irradiated head and neck cancer soft tissue reconstruction by fat transfer	93.121				$255,865
ISCHEMIA	93.837	Duke Clinical Research Institute	203-7684 A03-9008 A03-1953		$20,925

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ISCHEMIA TRIAL	93.837	New York University	26-C-10500-NYUPG-100422 1001073/26C10500NYUPG100422		$181,918
ITN087AD Anti-IL33 Study	93.855	Benaroya Research Institute at Virginia Mason	FY19ITN313		$45,793
Language connectivity pathways and neuroplasticity in aphasic stroke patients	93.173			$104,889	$159,188
Large aperture and wideband modular ultrasound arrays for the diagnosis of liver cancer	93.394			$304,792	$755,541
Large-Scale Characterization of Autoantibody Responses in Rheumatoid Arthritis	93.846				$148,187
Large-scale dual-color two-photon calcium imaging in awake behaving animals	93.853				$119,478
Large-scale functional validation of candidate transcripts emerging from GWAS and exome sequencing studies	93.847	Broad Institute, Inc.	5216279-5500001193		$180,247
Large-Scale Patterned Electrical Stimulation for Design of Retinal Prostheses	93.867			$78,631	$412,735
Lateral hypothalamic regulation of male and female sexual motivation	93.865				$29,684
Learning and brain plasticity in children with autism: relation to cognitive inflexibility and restricted-repetitive behaviors	93.242				$932,497
Learning Regulatory Drivers of Chromatin and Expression Dynamics during Nuclear Reprogramming	93.172				$806,779
Leveraging Routine Clinical Materials and Mobile Technology to Assess CBT Quality	93.242	Palo Alto Veterans Institute for Research	WIS0003-03		$12,859
Leveraging spectral encoding for high dimensional biological multiplexing	93.310				$602,438
Liberation of Plant Nutrients by the Gut Microbiota	93.310				$9,727
Life course contexts and work: quantifying impacts on aging and chronic disease	93.866				$75,668
Ligand-Receptor Dynamics and Cellular Responses Studied In Situ Using Venturi Easy Ambient Sonic-Spray Ionization Mass Spectrometry	93.242				$86,513
Lightsheet Microscope for Large-Scale Imaging of Cleared Tissue Samples	93.351				$330,125
Limbic Circuit Dysfunction in Offspring following Maternal Immune Activation	93.242				$59,630
Link between epigenetic modifiers and fat metabolism for healthy aging	93.866			$159,924	$334,674
Linking emotion, motivation and action with amygdalo-nigro-striatal circuits	93.242				$111,548
Linking Islet Cell Function and Identity from in vitro to in situ	93.847	University of Alberta	RES0041098-S001		$188,685
Listening to Mom in the NICU: Neural, Clinical and Language Outcomes	93.865				$27,107
LncRNA mechanisms in cancer	93.393				$938,576
LncRNA Regulators of Epidermal Homeostasis and Early Neoplasia	93.846				$65,917
LncRNA Transcriptional Mechanisms of Coronary Artery Disease Risk	93.837				$48,859
Longitudinal investigations of the infant virome and its associations with obesity	93.865			$394,369	$799,450
Longitudinal multi-omic profiles to reveal mechanisms of obesity-mediated insulin resistance	93.847				$579,622
Longitudinal Multiomics Microbial Profiling in Healthy and Disease Individuals	93.310				($249)
Longitudinal Neurocognitive Studies of Mathematical Disabilities: trajectories and outcomes	93.865				$643,234
Long-term metabolic effects of kidney events with intensive SBP control	93.847	University of Utah	Sub 10047597-01 PO #U000165213		$16,010
Long-term sequelae of early life pesticide exposure in the CHAMACOS birth cohort	93.310	University of California, Berkeley	00009395/BB00862228		($13,573)
Long-term trajectories of subjectively- and polysomnographically-assessed sleep patterns as predictors of neuroendocrine dysregulation and weight gain in adults	93.233	Utah State University	200979-414		$202,450
Low InTensity Exercise intervention for peripheral artery disease: The LITE Trial	93.837	Northwestern University	60039432 LESTAN		$11,779
Lung cancer in never smokers: incidence, risk factors, and molecular characteristics in Asian American, Native Hawaiian, and Pacific Islander women	93.393	University of California, San Francisco	10551sc		$10,070
Lymph Node Extracellular Matrix in Antigen Presentation and Immune Regulation	93.847			$162,741	$435,918
Machine learning to distinguish HAND from Alzheimer's disease in HIV over age 60	93.242	University of California, San Francisco	11254sc		$48,619
MACRA Episode Groups and Resource Use Measures	93.RD	Acumen, LLC.	MIDS-2013-13002I-T0002		$271,764
Macrophage phenotype polarization in clinical neoplasia	93.396				$539,138
Magnetic resonance Imaging as a Non-Invasive Method for Assessment of Pancreatic fibrosis (MINIMAP): a pilot study	93.847	Indiana University	IN-4687972-LSJU: PO# 2314322		$39,446
Mailed FIT Program to Improve Colorectal Cancer Screening in the San Francisco Safety-Net System	93.135	University of California, San Francisco	8427sc		$6,696
Making Better Decisions: Policy Modeling for AIDS and Drug Abuse	93.279			$128,201	$340,043
Making glycoproteomics via mass spectrometry more accessible to the greater scientific community	93.394				$596,689
Making the HIV-1 gp41 pocket amenable to small-molecule drug discovery	93.279				$1,208,672
Malaria Evolution in South Asia	93.855	University Of Washington	UWSC9949/ BPO 30664		$66,075
Management of Hypertension among Persons with and without Dementia in Long-Term Care	93.866				$21,137
Mapping and Manipulating Circuits for Emotion and Cognition in Anxiety and Depression	93.242				$94,757
Mapping chromatin secondary structure by sequencing correlated DNA strand breaks	93.172				$258
Mapping connectomes for disordered emotional states	93.242				$971,126
Mapping Protein Communication Between Organs in Homeostasis and Disease	93.847	Harvard University	153277.5107753.0004		$131,469
Mapping the CPLANE interactome, an extensive protein interaction network underlying human ciliopathies	93.865	University of Texas at Austin	UTA16-001173		$145,474
Marfan Aortic Embryologic Origin Influences miR-29b Regulators and Targets	93.846				$461,931
Massively parallel microwire arrays for deep brain stimulation	93.853				$101,084
Maternal Chronic Pain: Risk for Pain and Poor Outcomes in Children	93.865	Oregon Health & Science University	1006408_Stanford		$156,638
Maternal Health after Stillbirth: An Investigation of Postpartum Hospital Readmission in California	93.865				$74,796

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Maternal Outcomes and Neurodevelopmental Effects of Antiepileptic Drugs (MONEAD)	93.853	Emory University	T473240 / T662124		($37)
Maternal Outcomes and Neurodevelopmental Effects of Antiepileptic Drugs (MONEAD)	93.853			$2,418,454	$3,131,506
Mathematical and Computational Analysis for Inference of Species Trees	93.859	University of Alaska Fairbanks	UAF 16-0023 / PO: P0496538		$63,862
Measuring and Modulating Oxidative DNA Damage Surveillance Pathways	93.396				$357,713
Measuring Infant Pain Objectively using Sensor Fusion and Machine Learning Algorithms	93.279	Autonomous Healthcare, Inc.	1R41DA046983-01-S1		$67,791
Measuring isoform signaling in single breast cancer cells	93.394	University of California, Berkeley	00009076/BB00659697/ R01CA20318		$34,749
Mechanical circulatory support: Measures of adjustment and quality of life	93.837	Northwestern University	60043010 TLSJU		$61,521
Mechanism of the coronary heart disease association at chromosome 6q23.2	93.837				$694,854
Mechanism of the Eukaryotic Chaperonin TRiC/CCT	93.859				$322,757
Mechanism-based therapies for photoreceptor degeneration	93.867			$82,603	$340,286
Mechanisms and Consequences of Defective Flow-Induced Potassium Secretion in the Metabolic Syndrome	93.847				$222,082
Mechanisms and Innovation in Vascular Disease	93.837				$355,311
Mechanisms and targeting of SWI/SNF alterations in pancreatic cancer	93.393				$239,491
Mechanisms controlling microtubule organization during cell differentiation	93.310				$592,059
Mechanisms of Action of the Smyd3 Methyltransferase in Cancer Cells	93.396				$34,168
Mechanisms of Age-Related Microglial Impairment and Rejuvenation in Alzheimer's Disease	93.866				$39,719
Mechanisms of Aging in C. Elegans	93.866				$97,024
MECHANISMS OF CHROMATIN REMODELING DURING EPITHELIAL DEVELOPMENT	93.846				$33,991
Mechanisms of CLC Transporters and Channels	93.859			$132,467	$404,324
Mechanisms of Diet-Induced Pathogen Expansion in the Gut	93.855				$348,746
Mechanisms of enhancer activation in early development	93.859				$322,116
Mechanisms of Kinetochore Assembly	93.859				$50,546
Mechanisms of lncRNA-mediated control of epidermal proliferation and differentiation	93.846				$60,686
Mechanisms of NAT2 Regulation of Insulin Resistance and Mitochondrial Dysfunction	93.RD				$11,895
Mechanisms of persistent Salmonella infection	93.855				$179,702
Mechanisms of restriction point response to dynamic growth factor signals	93.859				$211,659
Mechanisms of Skeletal Stem Cell Aging	93.866				$221,505
Mechanisms of Synaptic Specificity in C. elegans	93.853				$411,291
Mechanisms regulating immunity to dengue viruses	93.855	The Rockefeller University	2U19AI111825-06		$34,579
Mechanisms underlying radiation and chemotherapy induced cognitive impairment	93.853	University of California, Irvine	2016-3313		$68,560
Mechanisms, Prevention and Treatment of Chronic Graft-vs.-Host Disease - Project 1	93.395	Dana-Farber Cancer Institute (489)	1153413		$17,135
Mechanisms, Prevention and Treatment of Chronic Graft-vs.-Host Disease - Project 1	93.395	Dana-Farber Cancer Institute (489)	1153414		$39,445
Mechanisms, Prevention and Treatment of Chronic GVHD - Project 3	93.395	Dana-Farber Cancer Institute (489)	1272413 1272414		$25,951
Mechanistic basis of allogeneic IgG-induced tumor eradication	93.398				$6,156
Mechanistic Studies on Regenerative Medicine Approaches to Childhood Blindness	93.867	University of Iowa	1001925001		$51,406
Mechanistic studies to assess the effect of omalizumab on immune cells in conjunction with randomized, controlled rapid multifood OIT (CoFAR11) trial	93.855	The Johns Hopkins University	2004200730		$57,638
Mechanobiology at Healing Bone-Implant Interfaces	93.121			$128,254	$589,234
Mechanotransduction and transcriptional regulation during artery development	93.837				$431,704
Mediators of Systemic Inflammation and Heart Failure Risk in the Community	93.837	Cedars-Sinai Medical Center	1572381		$49,518
Medical Rehabilitation Research Resource P2C	93.865	University of Pittsburgh	0048860 (126874-4)		$97,765
Medical Scientist Training Program	93.859				$1,521,637
Medication Assisted Treatment (MAT) Expansion Project: CA Hub & Spoke System Training and Learning Collaborative	93.788	University of California, Los Angeles	2000-S-VN579		$142,388
Meiotic Chromosome Inheritance in C. elegans	93.859				$568,966
Meiotic Chromosome Segregation in C. Elegans	93.859				($3,279)
Memory T cell development and survival in T cell responses of older individuals	93.855	Palo Alto Veterans Institute for Research	GOR0011-01		$129,181
Mental Health Technology Transfer Center (MHTTC) National Coordinating Center (NCC	93.243			$163,333	$565,414
Mentoring Patient-Oriented Clinical Investigators in Nephrology	93.847				$148,477
Metabolic derangements in ARDS	93.837				$60,050
Metabolic Engineering with Bioorthogonal Chemical Reporters	93.859				$304,781
Metabolic imaging comparisons of patient-derived models of renal cell carcinoma	93.396	University of California, San Francisco	10450sc		$230,870
Metabolic Imaging of Nonalcoholic Fatty Liver Disease	93.847	University of Maryland	1700999/14333/SR0000 4443		$49,773
Metabolic Therapy of GBM guided by MRS of hyperpolarized 13C-pyruvate	93.394				$383,789
Metabolic Underpinnings of AL Amyloid Cardiomyopathy	93.837				$139,892
Metabolomic Profiling of Explanted Pulmonary Arterial Hypertension Lungs	93.838				$55,188
Methods for Dynamic Causal Interactions in Human Brain Function and Dysfunction	93.853				$386,170
Methods for Dynamic Causal Interactions in the Developing Human Brain	93.865				$131,366
Microengineered Osteons for Bone Tissue Engineering	93.846			$14,669	$460,543
Microglial lipid droplets in Alzheimer¿s disease	93.866				$81,726
Microribbon-based Scaffolds for Bone Repair	93.121				$383,591
MicroRNA Control of Dilated Cardiomyopathy	93.837			$51,841	$619,977
microRNA Regulation of T Cell Senescence	93.855	Palo Alto Veterans Institute for Research	GOR0010-02, PO# GOR053503 GOR0010-03		$74,922
MicroRNA-Dependent Regulation of Synaptic and Behavioral Plasticity in Drosophila	93.853	Harvard University	152738.5095129.0305 152738.5095129.0405		$215,084
microRNAs, non-ion channel proteins and the control of drug-induced arrhythmia	93.837				$43,548
MIND the Kidneys	93.847			$34,795	$193,649
Miniaturized Automated Whole Blood Cellular Analysis System	93.855			$62,072	$368,185
Mining health data for drug safety profiles	93.859				$242,204

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miR-152: A Novel Regulator of Diabetic Cardiomyopathy	93.837				$259,249
miR-409-3p controls corticospinal development: therapies for spinal cord injury.	93.853				$182,927
MIRIAD - Multiplexed Imaging of Resilience In Alzheimers Disease	93.866			$83,012	$1,133,839
Mitochondrial inner membrane articheture in skeletal muscle pathophysiology	93.846				$39,471
Mitochondrial to nuclear gene transfer via synthetic evolution	93.859			$160,592	$237,052
Mixed NOP/mu Compounds and the Involvement of Their Receptors in Analgesia	93.279	Florida Atlantic University	BR-K99		$96,223
Mixed-Reality Neuronavigation for Transcranial Magnetic Stimulation Treatment of Depression	93.242			$18,077	$260,732
Mobility Data Integration to Insight	93.286				$1,470,439
Modeling and Predicting Therapeutic Resistance of Cancer	93.396				$518,278
Modeling Endothelial Dysfunction in LMNA-related Dilated Cardiomyopathy	93.837				$159,996
Modeling KRAS-Dependent Synthetic Lethality in Human Colon Organoids	93.395			$359,994	$730,083
Modeling Oral Cancer in Primary Organoid Culture	93.121				$11,650
Modeling Susceptibility to Chemotherapy-Induced Cardiotoxicity Using Human iPSCs	93.837			$9,822	$460,296
Modeling the Molecular Determinants of Induced Anti-Tumor Immune Responses in Mantle Cell Lymphoma	93.396				$689,084
Modeling the Role of Lymph Node Metastases in Tumor-Mediated Immunosuppression	93.397				$2,093,582
Modeling Tyrosine Kinase Inhibitor-Induced Vascular Dysfunction Using Human iPSCs	93.837			$7,574	$756,236
Models for Optimal Liver Transplant Outcomes	93.847				($2)
Modulating HSC-niche interactions to understand aging and improve transplantation	93.839				$497,291
Modulating the post-stroke inflammatory response to improve outcome in models of cerebral ischemia	93.853				$353,357
Modulation of gut bacteria-derived host metabolites	93.847				$159,157
Modulation of internal ribosome entry by ribosomal protein RPS25	93.855				$84,940
Modulation of the B cell response to dengue virus infection by Plasmodium falciparum co-infection	93.855				$184,520
Molecular analysis of Tmie in sensory hair cells	93.173				$74,533
Molecular and Cellular Immunobiology	93.855				$1,549,764
Molecular and cellular mechanisms of SCLC metastasis	93.396			$18,685	$404,854
Molecular and functional regeneration of the accessory optic pathway	93.867	The Johns Hopkins University	2003564303		$271,835
Molecular and morphological characterization of mouse and human hair cell regeneration	93.173				$216,391
Molecular and Neural Networks Underlying Social Attachment	93.242			$240,830	$1,016,596
Molecular and single-cell immunology of myalgic encephalomyelitis / chronic fatigue syndrome	93.855				$646,344
Molecular Basis of Host Parasite Interaction	93.855				$443,331
Molecular Basis of Sensory Transduction in C. elegans	93.853				$68,151
Molecular basis of tumor suppression by Cdk4/6 inhibition	93.395	University of California, Santa Cruz	A19-0344-S001-P0700755		$69,816
Molecular Biophysics Training Program at Stanford	93.859				$416,061
Molecular Characterization and Personalized Approaches to Non-Hodgkin Lymphoma from Circulating Tumor DNA	93.398				$11,163
Molecular Characterization of Cardiomyopathy Mutations in Human Cardiac Myosin	93.837	University of Colorado	RHL117138C/1556322/1001023086		$328,663
Molecular Discovery for Optic Nerve Regeneration	93.867			$543,481	$1,076,184
Molecular Dissection of an Arntl2 induced pro-metastatic secretome	93.396				$376,982
Molecular dissection of Lkb1-mediated tumor suppression	93.396				$373,723
Molecular Dissection of Lung Cancer Progression and Metastasis	93.396				$16,475
Molecular dissection of prefrontal cortex circuit architecture	93.242				$147,837
Molecular Genetic Analysis of TORC1 and TORC2 Signaling in Neuronal Maintenance	93.853				$453,779
Molecular images and machine learning to extract placental function from maternal cfDNA	93.865				$607,405
Molecular Imaging Methods for the Detection of Pancreatic Ductal Adenocarcinoma	93.394			$151,326	$697,803
Molecular Imaging of Cardiac Pluripotent Stem Cells	93.837				$359,058
Molecular Imaging of Protein Glycosylation in Living Subjects	93.310				$4,137
Molecular Insights into Membrane Curvature Recognition	93.859	Penn State College of Medicine	STU GM105963		$14,569
Molecular Mechanism and Novel Therapeutic Strategy in Alzheimer's Disease	93.310			$5,805	$495,120
Molecular Mechanism and Regulation of Asynchronous Release	93.242				$105,321
Molecular mechanism of the NKCC transporter	93.847				$37,283
Molecular Mechanisms Controlling Wallerian Degeneration of Axons	93.853				$224,892
Molecular mechanisms of genome maintenance during DNA replication and repair	93.398				$77,112
Molecular mechanisms of Hedgehog receptor function	93.859				$482,412
Molecular Mechanisms of Inflammasome Activation During Salmonella Infections	93.855				$341,182
Molecular Mechanisms of Insulin Resistance Associated Loci	93.847				$544,440
Molecular Mechanisms of Physiologic Beta Cell Growth in Juvenile Human Pancreas	93.847	Vanderbilt University Medical Center	VUMC53356		$192,465
Molecular mechanisms of SCLC initiation and detection in mice and humans	93.393				$564,745
Molecular mechanisms of Wnt and mechanical signaling through ß-catenin	93.859				$17,748
Molecular Mechanisms of Wnt Signal Transduction	93.859				$321,939
Molecular Mechanisms Regulating Inhibitory Circuitry in the Spinal Cord	93.853				$227,108
Molecular mechanisms that regulate target cell sensitivity to Hedgehog morphogens	93.859				$24,503
Molecular mechanisms underlying flow sensing in lymphatic endothehial cells	93.837				$331,878
Molecular mechanisms underlying force sensing at intercellular junctions	93.859				$405,479
Molecular mechanisms underlying force transduction at cellular adhesion complexes	93.859				$25,846
Molecular Neurobiology of Drug Addiction	93.279	Mt. Sinai School of Medicine	0254-7660-4609		$181,494
Molecular pathoepidemiology of contralateral breast cancer	93.393	Memorial Sloan-Kettering Cancer Center	BD523921		$206,594

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Molecular pathoepidemiology of contralateral breast cancer	93.393	The Fred Hutchinson Cancer Research Center	0000937379 PR#218920 Subaward 0000996528		$8,972
Molecular Pharmacology Training Grant	93.859				$221,596
Molecular Phenotyping in Alzheimer's Disease	93.866			$583,733	$903,322
Molecular Regulation of Stem Cell Aging	93.866	Baylor College of Medicine	7000000497 1163038-100-EHAUC		$131,820
Molecular Regulation of Stem Cell Aging	93.866			$1,320,639	$2,095,231
Molecular Spectroscopic Photoacoustic Imaging for Breast Lesion Characterization	93.286				$58,108
Molecular Target of a Novel Broad-Spectrum Antiviral and Antibacterial Compound	93.855	Oregon State University	P0428A-A		($145)
Molecular targeting of erythroid progenitor cells in normal and disordered human erythropoiesis	93.839	The Feinstein Institute for Medical Research	500798SU		$98,616
Molecular tools for labeling and manipulating functional brain circuits	93.242				$26,865
Molecularly-Targeted Ultrasound in Ovarian Cancer	93.394				$509,270
Molecules and Mechanisms of Mammalian Hair Cell Mechanotransduction	93.173				$830,094
Monitoring of Stem Cell Engraftment in Arthritic Joints with MR Imaging	93.846				$441,893
Mosquitoes meet Microfluidics: Novel tools for Ecological Surveillance of Insect borne Disease	93.855				$311,310
Motivational determinants of postpartum lifestyle behaviors, weight retention, and metabolic syndrome	93.837	Kaiser Foundation Research Institute	210015-Stanford		$9,984
Mouse vestibular regeneration and function	93.173				$471,865
MR-Guided Focused Ultrasound Combined with Immunotherapy to Treat Malignant Brain Tumors	93.394				$745,536
MR-guided Focused Ultrasound Neuromodulation of Deep Brain Structures	93.242				$565,696
MRI Methods for High Resolution Imaging of the Lung	93.838	University of California, San Francisco	10923SC		$53,348
MRI-based Quantitative Susceptibility Mapping of Hepatic Iron Overload	93.847	University of Wisconsin-Madison	813K923		$228,802
MRI-Based Radiation Therapy Treatment Planning	93.394				$328,209
mRNA Template-free Protein Elongation: a New Paradigm for Quality Control at the Ribosome	93.859				$306,273
Mucosal Immune Defense Mechanisms of the Urinary Bladder	93.855	The Washington University	WU-19-392		$41,034
Mulan: a novel regulator of mitochondrial dynamics, mitophagy and heart function	93.837				$491,230
Multi-Arm Optimization of Stroke Thrombolysis (MOST) Stroke Trial	93.853	University of Cincinnati	011266-011		$78,395
Multicenter International Durability and Safety of Sirolimus in LAM Trial (MIDAS) Clinical Study	93.837	The LAM Foundation	MIDAS Site Agreement - 1		$1,576
Multicenter Interventional Lymphangioleimyomatosis Early Disease Trial (MILED)-CCC	93.837	University of Cincinnati	010575-006/PO L19-4500108564 010575-002		($227)
Multi-center Randomized Controlled Trial of Refeeding in Anorexia Nervosa	93.865	University of California, San Francisco	9069sc		$152,862
Multidimensional Analysis of the Immune Status of Latent M. Tuberculosis Infection	93.855				$7,855
Multidimensional cellular interrogation of the kidney in AKI and CKD	93.RD	University of California, San Francisco	10361sc		$49,997
Multi-dimensional network framework for AD detection and progression	93.866				$5,898
Multi-Disciplinary Training Program in Cardiovascular Imaging at Stanford	93.286				$144,243
Multi-Institutional Training in Genetic/Genomic Approaches to Sleep Disorders	93.233	University Of Pennsylvania	574911; #10060997		$57,289
Multi-Institutional Training in Genetic/Genomic Approaches to Sleep Disorders	93.837	University Of Pennsylvania	574911 / RIS 33679/00		$127,669
Multimodal analysis of high-risk psychosis mutations in induced neuronal cells	93.242			$824,648	$2,058,023
Multimodal approach investigating the immunomodulatory effect of neural stem cells in stroke recovery	93.853				$220,149
Multi-modal study of cognitive and neural differences in media multitaskers	93.242			$386,154	$471,706
Multimodality Molecular Imaging of Stem Cell Therapy for Ischemic Cardiomyopathy	93.837				$440,827
Multiomic Signatures of Microbial Metabolites Following Prebiotic Fiber Supplementation	93.213				$438,899
Multiplex Platform for Point-of-Care Newborn Screening of Hyperbilirubinemia	93.865	Baebies, Inc.	HD072853		$103,217
Multiregional imaging phenotypes and molecular correlates of aggressive versus indolent breast cancer	93.394				$424,781
Multi-regional neural circuit dynamics underlying short-term memory	93.853	Baylor College of Medicine	7000000465		$71,635
Multi-scale data integration frameworks to improve cancer outcomes	93.113				$212,758
Multi-Scale Laws of Myocardinal Growth and Remodeling	93.837	University of California, San Francisco	8229sc		$71,985
Multiscale modeling for vein graft failure risk stratification in CABG patients	93.837			$127,109	$326,470
Multiscale Modeling of Myelodysplastic Syndromes	93.839	Virginia Commonwealth University	FP00000825_SA004		($17,066)
Multisite Phosphorylation and M-Phase Regulation	93.859				$907,844
Multivariate statistical methods, flow cytometry and network modeling.	93.859				$19,136
Myosin Movement in Vitro-Molecular Characterization	93.859				$590,690
Myotonic Dystrophy: Molecular Pathophysiology and CNS Effects	93.853	University of Florida	UFDSP00011946		$67,361
NACC Supplement 2019 and Subcontract	93.866	Washington University	BPO32896		$16,265
Nanomedicine Center for Nucleoprotein Machines	93.862	Georgia Institute of Technology	R7747-G12		($54)
Nanoneedle microrobots for single cancer cell manipulation and genome editing	93.396				$139,841
Nano-optical reporters of dynamic mechanotransduction in the immune system	93.855				$19,625
Nanoparticle-based Triple Modality Imaging and Photothermal Therapy of Brain Tumors	93.394				$400,822
Nanotechnology for Non-perturbative, Longitudinal Sampling from hiPSC Cardiomyocytes	93.286				$185,683
National Center for Simulation in Rehabilitation Research	93.865			$36,718	$922,959
Native American Alzheimer's Disease Resource Center for Minority Aging Research (NAD-RCMAR)	93.866	Washington State University	132471 G003957		$20,644
Natural Killer Cell Diversity and Epigenetics in Vaccine Responses	93.855				$2,420
Natural killer cell repertoire in HIV infection outcomes	93.855				$23,663
Natural killer cells in Zika virus pathogenesis	93.855			$38,323	$236,044

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NCANDA: Data Analysis Component	93.273	SRI International	PO15305/ 1044654-100-KATJT PO15305		$344,370
Neighborhoods and Coronary Disease: Exploring Mechanisms and Improving Methods	93.837	Lund University	Grant # 1R01HL116381-01A1		$26,194
Network Control of Diabetes: Aligning Artificial Pancreas Design with Physiology - DP3	93.847	University of Virginia	GC12268 145179		$11
Neural and Kinematic Features of Freezing of Gait for Adaptive Neurostimulation	93.853				$22,568
Neural Basis of alcohol/substance use disorders and suicide in American Indians	93.273	The Scripps Research Institute	5-53951		$9,140
Neural Basis of Behavioral Sequence Loops	93.853	Harvard University	149420.5104941.0103 1028077-678-EAFGS		$426,348
Neural Basis of sensory-Guided Motion	93.853	California Institute of Technology	S399719	$118,838	$472,569
Neural Circuit Dynamics of Drug Action	93.279				$4,101,912
Neural circuit mechanisms underlying hierarchical visual processing in Drosophila	93.242				$53,969
Neural Circuitry and Synaptic Physiology Underlying MDMA's Prosocial Effect	93.242				$204,726
Neural coding of interneuron populations in the retina	93.867				$558,741
Neural Dimensions of Threat Reactivity and Regulation for Understanding Anxiety	93.242				($3,786)
Neural Dynamics and Adaption for Brain-Machine Interface control	93.853				$36,726
Neural Modulation System for in-Home Treatment of Overactive Bladder	93.866	TheraNova	1R43AG058272-01//R43AG058272		$56,936
Neural Networks Underlying Impaired Information Gating in Major Depression	93.242				($3,200)
Neurobehavioral Trajectories of Pediatric Depression and Insulin Sensitivity	93.242				$404,209
Neurobiology and dynamics of Active Sensing	93.242	Columbia University	8(GG012936-02) 8(GG012936-03)		$215,773
Neurochemical and functional neuroimaging of negative and positive valence systems in binge eating	93.242				$186,182
Neurocognitive mechanisms of age-related declines in context-driven adjustments of cognitive control	93.866				$63,007
Neurodegeneration and brain function in Aging with HIV and Parkinson¿s Disease	93.273	SRI International	157-000005		$22,096
Neurodevelopment and Psychosis in the 22q11.2 Deletion Syndrome	93.242	University of California, Los Angeles	2000GVG294		$153,067
Neurodevelopment and Vector-borne Diseases: Building Research Capacity in the Tropics	93.989	Windward Islands Research and Education Foundation	Stanford 2016-01		$79
Neuroimaging and Mentoring in Translational Pain Research	93.279				$130,786
Neuroimaging of Alcohol-Induced Neuroadaptation: Translation from Animals to Humans	93.273	SRI International	PO10259		$199,797
Neuroimaging Predictors of Pivotal Response Treatment in Young Children with Autism	93.173				$146,094
Neuroimaging-Based Brain and Spinal Cord Biomarkers for Cervical Radiculopathy	93.853				$134,883
Neuroligin 3 in oligodendrocyte development	93.853				$1,652
Neuromodulation of Brain States	93.853				$628,260
Neuronal activity-regulated mechanisms of glioma growth	93.853				$390,538
Neuronal and behavioral responses to spinal cord injury	93.853				$719,909
Neuronal Ensembles to Networks: Ultrahigh Resolution Imaging of Human Brain Function and Connectivity	93.286	University Of Minnesota	N006269301		$58,149
Neuronal mapping of anxiety and panic	93.242			$70,726	$243,286
Neuropathologic substrates for motor and cognitive impairment in three existing cohort studies of Alzheimer's disease and related dementias	93.866			$618,995	$1,144,542
Neuroprotection by Modulating ER Stress in Glaucoma	93.867				$162,653
NeuroScout: A cloud-based platform for rapid re-analysis of naturalistic fMRI datasets	93.242	University of Texas at Austin	UTA16-001175		$133,584
Neurostimulation by Ultrasound: Physical, Biophysical and Neural Mechanisms	93.286				$72,884
New Methods of Quantitative Modeling of Protein-DNA Interactions	93.859	Duke University	Subaward # 2034965 A030289		$44,737
New Statistical Methods for Medical Signals and Images	93.286				$337,897
New Therapeutics for Post-Transplant Lymphoproliferative Disorder	93.855				$341,789
NEXT-GEN Oral Test for Monitoring HIV/AIDS in Point-of-Care	93.121	Gaia Medical Institute	GAIA		($10,784)
Next-generation computational/chemical methods for complex RNA structures	93.859				$775,974
Next-Generation Genomic Imaging Technology	93.310				$528,209
NFAT control of pancreatic islet beta-cell functional maturation	93.847			$52,121	($44,117)
NHGRI Genome Sequencing Program Coordinating Center	93.172	Rutgers University	0356 / PO# 768582 0857 PO 1037371		$101,178
NHGRI PAGE Coordinating Center	93.172	Rutgers University	5943-PO#693120		$87,250
NICHD Maternal-Fetal Medicine Units (MFMU) Network	93.865				$16,175
NIH StrokeNet National Data Management Center (NDMC)	93.853	Medical University of South Carolina	MUSC14-018		$19,099
NINDS Efficacy Clinical Trials: National Clinical Coordinating Center (NCC) Renewal	93.853	University of Cincinnati	011414-Adm-Wintermark		$16,341
NiPype: Dataflows for Reproducible Biomedical Research	93.286	Massachusetts Institute of Technology	5710004077		$125,946
NMDAR Modulation As A Therapeutic Target and Probe of Neural Dysfunction in OCD	93.242			$43,574	$797,576
Non-cardiomyocyte miR-34a Mediates Susceptibility to Right Heart Failure	93.837				$143,494
Non-coding RNA regulation of sex differences in stroke	93.853				$73,322
Non-coding RNA Structure through a Mutate-and-Map Strategy	93.859				$16
Non-esterified fatty acids and dementia; risk, structure and biomarkers	93.866	Brigham and Women's Hospital	119900		$16,218
Nonhuman Primate Testing Center for Evaluation of Somatic Cell Genome Editing Tools	93.351	University of California, Davis	A19-2678-S001		$4,860
Noninvasive bioluminescent imaging of neuronal activity in freely behaving animals	93.279				$87,980
Non-invasive brain stimulation approaches to visual system modeling and plasticity	93.867				$124,985
Noninvasive deep-tissue single-cell imaging and nanoprobe development	93.859				$516,909

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Noninvasive monitoring of lung cancer patients treated with radiotherapy	93.395				$308,968
Noninvasive neuromodulation via focused ultrasonic drug uncaging	93.242				$556,224
Non-REM (NREM) on synapse plasticity and beta amyloid (Aß) accumulation in mice: impact on aging and Alzheimer's	93.866				$36,026
North American Mitochondrial Disease Consortium (NAMDC)	93.853	Columbia University	8(GG010312-21)		$21
Notch Signaling and Satellite Cell Activation	93.866				$547,971
Notch signaling in small cell lung carcinoma	93.396				$268,518
Novel Atrial Fibrillation Phenotypes Defined by Functional-Anatomical, Machine-Learned Classifications	93.837				$68,490
Novel Bayesian linear dynamical systems-based methods for discovering human brain circuit dynamics in health and disease	93.286				$688,235
Novel flavored tobacco products: Adolescent perceptions and behaviors	93.279				$59,291
Novel Mechanisms of Regenerative Wound Healing	93.859	Baylor College of Medicine	7000000263		$14,389
Novel Molecular Mechanisms Regulating Postnatal Pulmonary Angiogenesis	93.838				$298,125
Novel Molecules as In Vivo Biological Probes	93.859				$147,033
Novel pathways regulating calcium mediated contractility in the pregnant uterus	93.865			$12,815	$529,651
Novel proximity assay platform for the quantitative detection of HBsAg and HCVcAg	93.061	Ocean Nano Tech, LLC	SPO#136155		$48,773
Novel Regulators of Inflammatory Arthritis and Bone Erosion	93.846	Washington University	WU-15-345/PO #2923117Y		$43,845
Novel strategies to prevent malaria and improve maternal-child health in Africa	93.865	University of California, San Francisco	9943sc		$20,000
Novel therapeutic approaches for enhancing anti-tumor immunity SCLC	93.393	University of Texas MD Anderson Cancer Center	3001010207 3001204957		$145,757
Novel Transducer Technology for Transcranial Ultrasound	93.286				$684,551
Nucleic Acid Enzymes Studied at the Molecular Level	93.859				$494,197
Numbers in the Human Brain	93.242				$485,709
Occupational Exposure to PM2.5 and Cardiovascular Disease(CVD)	93.262			$241,926	$555,099
Ocular Stem Cells for Vision Recovery	93.867				$297,513
Oligoclonal T Cell Expansion and Rheumatoid Arthritis	93.846				$192,761
Omics for TB: Response to Infection and Treatment	93.855	Infectious Diseases Research Collaboration	SU-10170		$25,622
Omics for TB: Response to Infection and Treatment	93.855	Seattle Children's Hospital	12038SUB 11925SUB		$134,804
ONBOARD: OvercomiNg Barriers & Obstacles to Adopting Diabetes Devices	93.847				$43,051
Only time will tell: a computational psychiatry approach to model temporal transitions in brain activity as a lens towards developing better diagnostic nosology for psychiatric illness	93.242				$171,679
OpenNeuro: An open archive for analysis and sharing of BRAIN Initiative data	93.242				$788,263
Optical dissection of the neural circuitry controlling sensorimotor gating	93.242				$50,750
Optical pacing using graphene-cardiomyocyte interfaces for precision medicine and drug discovery	93.837				$453,879
Optimization of an activatable photoacoustic agent to image thyroid cancer	93.286				$232,299
Optimized ultrasound-enhanced immunotherapy	93.394			$83,507	$544,016
Optimizing Lung Cancer Treatment in HIV Infected Persons	93.393	Icahn School of Medicine at Mount Sinai	0255-2961-4609		$29,600
Optimizing safety of mother and neonate in a mixed methods learning laboratory	93.226			$74,346	$648,433
Optimizing Stem Cell-Enhanced Stroke Recovery through a Bioengineered Electrically Conductive Polymer Scaffold	93.853				$167,330
Option 5 Bridge RFP-DT-032417-1	93.RD	SRI International	61-000768		($116)
Optogenetic approaches to study post-stroke recovery mechanisms	93.853				$607,476
Optogenetic Control of Vigilance State Transition	93.242				($950)
Optogenetic Engineered Heart Muscle for Disease Modeling	93.837				$155,209
Optogenetic interrogation of sleep circuits during aging	93.866			$28,007	$537,695
Optogenetics for all: A general method for optical control of protein activity	93.859				($14)
Oral Polio Vaccine (OPV) and Oral Cholera Vaccine (OCV) Coadministration Study	93.283	International Centre for Diarrhoeal Disease Research,Bangladesh	1228		$73,816
Organoid-Based Discovery of Oncogenic Drivers and Treatment Resistance Mechanisms	93.393				$922,648
Origin of latent hematopoietic stem cells in the aged bone marrow	93.866				$129,460
Origins of human blood lineages in regenerative medicine	93.286				$493,509
Osteoarthritis: Quantitative Evaluation of Whole Joint Disease with MRI	93.286				$442,630
Osteoporotic Fractures in Men (Mr. Os) Palo Alto	93.866				$327,271
Otic Sensory Lineage Specification and Gene Regulation	93.173				$244,409
Oxygen Activation by Mononuclear Copper(I) Active Sites	93.859				$33,821
Oxygenation Fingerprinting with MRI for Ischemic Stroke	93.853				$109
Pacific Udall Center	93.853			$1,184,479	$1,673,517
Packaging and Spreading the Stanford Pediatric Weight Control Program - A Family-Based, Group, Behavioral Weight Control Program for Children with Obesity and their Families	93.349				$118,854
Palliative care needs and outcomes for dementia patients	93.866				$256,246
Pancreatic Cyst Biomarker Validation Study	93.394	University of Pittsburgh	0059566 (130769-4)		$146,169
Pancreatic Ductal Adenocarcinoma Targeted Ultrasound Contrast Agent Development	93.394	NuvOx Pharma LLC	NuxOx SBIR		$178,086
Parasite-specific proteasome inhibitors to combat multi-drug resistant malaria	93.855			$54,016	$227,691
Particulate Delivery of STING Agonist as Anti-cancer Immuotherapeutics and Cancer Microbiome	93.398				$47,716
Paternal medications and congenital malformations in offspring	93.865				$117,339
Pathology Review: NIH National Clinical Trials Network (NCTN) Grant (U10CA180886) successor to NIH COG Chair Grant (U10CA098543)	93.395	Children's Hospital of Philadelphia	FP15221_SUB864_01		$61,454
Pathways towards regenerating the mammalian cochlea	93.173				$432,867
Patient Oriented Research and Mentoring in Obesity and Urinary Incontinence	93.847				$198,414
Patient Oriented Research in Cardiovascular Regeneration	93.837				$103,083
Patient Oriented Research in Vulnerable Populations with Skin Disease	93.846				$52,306
Patient Specific Induced Pluripotent Stem Cell Derived Cardiomyocytes to Define Mechanisms of Electrical-Mechanical Dysfunction in DilatedCardiomyopathy	93.837				$150,933

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Patient-Directed Computational Analysis of Atrial Fibrillation	93.837	University of California, San Diego	Subaward #66389647		$29,227
Patterning dendritic branches with environmental and neuronal surface molecules	93.853				$291,610
PCP in vertebrate epithelial tubes	93.859				$432,944
PCSK9 Inhibition after Heart Transplantation	93.837				$168,094
Pediatric Brain Tumor Consortium	93.393	St. Jude Children's Research Hospital	110068201-7821844		$46,080
Pediatric Brain Tumor Consortium	93.395	St. Jude Children's Research Hospital	110068200-7821844 110068185-7707906		$41,455
Pediatric Critical Care and Trauma Scientist Development Program (PCCTSDP)	93.865	University of Utah	10034012-STAN 10034012-STAN; PO#U000142664		$122,224
Pediatric Eye Disease Investigator Group	93.867	Jaeb Center for Health Research	5U10 EY011751-20		$345
Peizo1 in neural stem cell mechanoregulation	93.853	University of California, Irvine	2018-3650		$2,450
Perinatal Arterial Stroke: A Multi-site RCT of Intensive Infant Rehabilitation (I-ACQUIRE)	93.853	Virginia Tech	432107-19751		$21,864
Peripheral and central immune contributions to pain chronification	93.853				$223,354
Peripheral Arterial Disease in Older Patients with Chronic Kidney Disease	93.847				$98,892
Personalized Whole Body Staging for Children with Cancer: A Solution to the Conundrum of Long-Term Side Effects from CT and PET/CT Scans	93.865				$612,831
Personalized, Dynamic Risk-based Lung Cancer Screening	93.398				$47,628
Pesticide exposures and risk of preterm birth	93.865				$162,359
PETAL-Prevention and Earl Treatment of Acute Lung Injury	93.838	University of California, San Francisco	9016sc		$41,239
Pf Bacteriophages in the Pathophysiology of Cystic Fibrosis and Pseudomonas aeruginosa Infection	93.855				$187,260
Pharmacogene Variation Consortium	93.859	Children's Mercy Hospital	17-0012		$343,425
Pharmacology of Aminophylline for Acute Kidney Injury in Neonates and Children	93.865				$151,707
PharmGKB: pharmacogenomic knowledge for precision medicine	93.859				$1,795,327
Phase 2 Study of Selective Cytopheretic Device for the Treatment of Pediatric Patients with Acute Kidney Injury	93.103	Cincinnati Children's Hospital Medical Center	134248		$11,336
Phase 2 Study of Sildenafil for the Treatment of Lymphatic Malformations	93.103				$121,127
Phase 3 Trial of DCA in PDC Deficiency IND 028,625 (02/04/2015)	93.103	University of Florida	UFOCR00012073		$3,685
Phase I Molecular and Clinical Pharmacodynamic Trials ET-CTN	93.395	Beckman Research Institute Of The City Of Hope	51183.2000123.669303		$34,010
Phase II Study of Ad/PNP(IND14271,1/19/10)for HNSCC(OrphanDrugDes,14-4438,6/8/15)	93.103	Emory University	A014084		$146,006
Phase II: Commercialization of a preclinical Magnetic Particle Imaging system with sub-millimeter resolution, nano-molar sensitivity, and integrated CT	93.351	Magnetic Insight, Inc.	SPO 130394		$146,704
Phase II: Development of a Neurovascular Magnetic Particle Imaging system with sub-millimeter resolution and real time speed for non-radiative 3D perfusion angiography	93.351	Magnetic Insight, Inc.	SBIR Phase II		$6,065
Phase one clinical trial of a novel small molecule EBNA1 inhibitor, VK-2019, in patients with Epstein- Barr positive nasopharyngeal cancer, with pharmacokinetic and pharmacodynamic correlative studies	93.395				$143,795
PHASER - Pluridirectional High-energy Agile Scanning Electronic Radiotherapy	93.393	TibaRay, Inc.	1R43CA217607/NIHSBIR-2017-01		$10,175
Phenotype Heterogeneity and Dynamics in SCLC	93.397	Vanderbilt University	UNIV60169		$238,051
Phenotypic profiling of bacterial stress response networks: A transformative framework for characterizing and predicting antibiotic targets and interactions	93.855				$60,585
Photovoltaic Subretinal Prosthesis with High Pixel Density	93.867				$894,991
Physical Activity to Improve CV Health in Women: A Pragmatic Trial CCC-Lead	93.837				$1,333,727
Physician Organization and the Use, Cost and Outcomes of Care	93.226				$238,758
Physiologically Based Markers of Idiopathic Intracranial Hypertension	93.867				$116,033
Plasmacytoid Dendritic Cell microRNAS in Transplantation	93.855				$60,477
Plasticity of GABAergic inhibition following head injury	93.853				($891)
Platform Technologies for Microscopic Retinal Imaging: Development & Translation	93.867			$321,593	$1,133,034
Platform technology for detection of cancer-associated viruses in HIV patients	93.121			$386,304	$364,876
Polarizing T Cell Responses in vivo With Dendritic Cells	93.847				$506,425
Population genetics for large-scale sequencing studies of diverse populations	93.172			$227,780	$377,750
Population Neural Activity Mediating Sensory Perception Across Modalities	93.853			$227,061	$417,504
Portable Nanostructured Photonic Crystal Device for HIV-1 Viral Load	93.855			$88,579	($4,844)
Postdoctoral Training in the Radiation Sciences	93.398				$175,515
Postgraduate Training Program in Epithelial Biology	93.846				$210,433
Postpartum Hemmorrhage and Anemia: Epidemiologic and Cost-Effectiveness Analyses	93.865				($1,438)
Post-Surgical Predictors of Depression and Weight Regain After Bariatric Surgery	93.847	Sanford Research North	SR-2019-209 51-2031-5035-7		$283,466
Post-Traumatic Headache (PTH) in Children: Alterations of Brain Function, Blood Flow and Inflammatory Processes	93.853	Boston Children's Hospital	PO#GENFD0001502361		$14,531
PQ3: Age-related immune deviation and cancer outcome	93.395				$61,838
Prazosin for Disruptive Agitation in AD (PEACE-AD) Trial	93.866	University of California, San Diego	87750190; PO #S9002309		$1,291
Precancer Atlas for Integrative Characterization of ductal carcinoma in situ (DCIS).	93.353	Duke University	A030739		$23,147
Precancer Atlas for Integrative Characterization of ductal carcinoma in situ (DCIS).	93.393	Duke University	1027999-109-EAFNH: #A030740		$414,927
Precancer Atlas of Familial Adenomatous Polyposis	93.353				$2,261,851
Precision medicine for Asian Americans requiring anesthesia	93.859				$338,473
Precision Medicine for Dilated Cardiomyopathy in European and African Ancestry	93.RD	Ohio State University	60071067; PO# RF01566437		$12,161
Preclinical Testing of a Novel Therapy Targeting AXL in Advanced Kidney Cancer	93.395			$65,289	$446,821
Preclinical Validation of Transglutaminase 2 as a Novel Target for Celiac Disease	93.847			$159,316	$403,969

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Predicting Analgesic Response to Acupuncture - A Practical Approach	93.213				$190,365
Predicting casual non-coding variants in a founder population	93.172			$135,855	$105,490
Predicting Clinical Outcome After Traditional and Ibrutinib-Based Therapy in Chronic Lymphocytic Leukemia	93.394	Mayo Clinic	LSU-203034/PO#65953298 LSJ-203034-01/PO#66674629		$32,944
Predicting Clinical Outcomes in Individuals with Small CLL B Cell Clones	93.394	Mayo Clinic	LSU-207246/66194852		$30,023
Predicting Long-Term Chemotherapy-Related Cognitive Impairment	93.RD	University of Texas at Austin	1187887-100-EHBEB		$4,865
Predicting Resilience in the Human Microbiome	93.310	Palo Alto Veterans Institute for Research	REL0028-01		$140,512
Prediction of short-term risk of coronary heart disease and overall risk of ischemic cardiomyopathy	93.837				$51,373
Predictive Adherence Modeling (PAM) Study	93.233				($539)
Predictive signatures in breast cancer using multiplexed ion beam imaging	93.310				$214,671
Predictors and outcomes of frailty in dialysis patients	93.847	Hennepin Healthcare Research Institute	9194sc 00227-02		$19,325
Predoctoral Training Consortium in Affective Science	93.RD	University of California, Berkeley	8572		($6,312)
Predoctoral Training in Biomedical Imaging at Stanford University	93.286				$268,579
Preeclampsia to cardiovascular disease: Life course analysis of biomarkers and risk	93.837				$585,323
Pre-Leukemic Hematopoietic Stem Cells and Clonal Evolution in Human AML	93.396				$205,635
Preparing for a hybrid trial of pulse oximetry de-implementation in stable infants with bronchiolitis	93.838	Children's Hospital of Philadelphia	3201160619		$1,383
Preservation of Vascular and Functional Health Among Nonagenarians	93.837				$66,323
Preserving Beta-Cell Function with Tocilizumab in New-onset Type 1 Diabetes	93.855	Benaroya Research Institute at Virginia Mason	FY19ITN108 FY17ITN108-06 FY17ITN108- 4 FY18ITN108		($6,630)
Prevalence and Clinical Significance of Relative Sarcopenia and Excess Adiposity in Adults with Chronic Kidney Disease	93.847				$68,181
Prevalence and Prognosis of Blood Pressure Medication Deintensification among Older VA nursing Home Residents	93.866	Northern California Institute for Research and Education	PER2133-01		$123,377
Prevalence, Etiology, and Clinical Implications of Low Count Monoclonal B-cell Lymphocytosis (MBL)	93.866	Mayo Clinic	STA-244577/PO #66199733		$20,998
Preventing Avoidable Infectious Complications by Adjusting Payment II	93.226	Harvard Pilgrim Health Care	2R01HS018414-06		$50,325
Preventing Epilepsy Using Vigabatrin in Infants with Tuberous Sclerosis Complex	93.853	University Of Alabama In Birmingham	000510297-002 000510297-002; 5U01NS092595-04		$198,332
Preventing HIV Transmission using a novel sequence-sharing analytic platform: A Multi-jurisdiction Health Systems Approach	93.855	Georgetown University	GR412006-SU AWD-4335044		$21,907
Prevention Center U01: Early Targets For Antigen-Specific Tolerance Induction in Preclinical Rheumatoid Arthritis (Project number: 2-5-24210)	93.855	University of Colorado Denver	2-5-M7126 FY18.090.001 2-5-M8203		$206,639
Prevention of neonatal opioid withdrawal syndrome	93.865			$160,139	$477,756
Prevention Policy Modeling Lab	93.084	Harvard University	116532-5107227		$177,000
PRIDEnet for the All of Us Research Program	93.310				$514,781
Primary Immune Deficiency Treatment Consortium	93.855	University of California, San Francisco	11267sc		$50,963
Primary Outcomes in Glomerulonephritis Study (PROGRESS)	93.847	University Of Pennsylvania	sub # 574238 PO# 3904166		$21,532
Probing Alzheimer synaptopathy in neurons derived from engineered human iPS cells	93.866				$355,669
Probing the Transcriptome with Multifunctional Acylation Chemistry	93.859				($348)
Probing the Transcriptome with Multifunctional Acylation Chemistry	93.RD				$519,151
Processing of Thalamocortical Inputs by Intracortical Circuits	93.867				$386,682
Production Center for Mapping Regulatory Regions of the Human Genome	93.172			$485,690	$4,489,057
Profiling and Dissecting the Dynamic Regulation of RNA Editing	93.859			$15,901	$497,923
Profiling the protective B cell response to HCV	93.855			$216,000	$737,443
Prognostic Metabolic Signatures of Cancers through Mass Spectrometry Imaging	93.394				$206,234
Program in Translational and Experimental Hematology	93.839				$200,818
Project 4: Integrated Health, Behavioral and Economic Research on Current and Emerging Tobacco Products	93.937	University of California, San Francisco	10984sc		$150,894
Project 5 Title: Multimorbidity, as part of Health and Aging in Africa (HAALSI)	93.866	Harvard School of Public Health	116360-5109417-Project 5		$34,382
Projection-specific modulation of neural activity with a non-genetic method.	93.242				$103,286
Proliferation and Differentiation of Bladder Epithelial Cells in Regeneration and Malignancy	93.396				$623,982
Promoting optic nerve and retinofugal pathway regeneration	93.867				$178,534
Prophylactic Multimodal Cognitive Intervention for Children with Medulloblastoma	93.393	St. Jude Children's Research Hospital	111997040-7827986		$55,426
Protective mechanisms of ischemic postconditioning	93.853				$170,524
Protege: A Knowledge-Engineering Environment for Advancing Biomedical Sciences	93.859				$713,178
Protein Aggregation and Inclusion Body Formation	93.853				$7,913
Protein Folding in the Eukaryotic Cytosol	93.859				$718,316
Protein Kinase C Isozymes in Ischemic Heart	93.837				$524,870
Protein-based Molecular Memories in Gene Regulation, Disease, and Development	93.859				$889,906
Protein-Engineered Hydrogels for Gene Transplantation for Myocardial Infarction	93.837				$157,646
Proteolytically Cleaved Receptors as Oncogenes and Therapeutic Targets	93.398				($3,376)
Proteomic determinants of direct measures of insulin sensitivity	93.847				$839,123
Proteomics Approach to Identify Cardiokine Signaling in Human iPSC Models	93.837				$71,741
Proteostasis in Aging and Neurodegenerative Disease (Core B)	93.866	Northwestern University	60052294 STAN		$60,967
Proteostasis in Aging and Neurodegenerative Disease (Project 1)	93.866	Northwestern University	60052293 STAN		$331,252
Proteostasis in the aging brain	93.866				$635,191
Prototype optical device for image guided surgery with panitumumab-IRDye800	93.394				$972,985
Prototyping an ultrasound system for localized delivery of neuromodulatory agents and functional imaging in awake primates	93.853	Vanderbilt University Medical Center	VUMC69042		$204,999

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PSMA activatable MRI contrast agents to improve the detection of prostate cancer	93.286				$3,070
Psychiatric Genomics Consortium for PTSD	93.242	University of California, San Diego	78647299: PO# S9001459		$7,825
Psychobiological Mechanisms Underlying the Association Between Early Life Stress and Depression Across Adolescence	93.242				$538,106
Psychological Risk Factors for Persistent Opioid Use and Prevention of Chronic Opioid Use and Misuse After Surgery: Postoperative Motivational Interviewing and Guided Opioid Weaning	93.279				$389,079
Public Health Surveillance for the Prevention of Complications of Bleeding and Clotting Disorders	93.080	Center for Inherited Blood Disorders (CIBD)	CIBDIX2015CDC-STAN-3 CIBDIX2015CDC-STAN-4		$19,727
Public Insurance Design and Health at Older Ages	93.866				$37,511
Pulmonary Complications in a Birth Cohort after a Randomized Trial of Exposure to Antenatal Corticosteroids: the ALPS Follow-Up Study	93.838	The George Washington University	2-AF-32 PO 1000220114 1009079-100-HAGNJ		$19,293
Pulmonary Hypertension Breakthrough Initiative	93.837	Indiana University	IN4687798STAN; PO#2029358		$108,623
Pulmonary Hypertension In Genetically Modified Mice	93.838				$740,446
Pumps for Kids, Infants, and Neonates (PumpKIN) Clinical Trial	93.RD	New England Research Institute	Task Order 6 Option 1 Task Order 6 Option 2		$96,309
Qualification and Deployment of Imaging Biomarkers of Cancer Treatment Response	93.394			$27,200	$721,663
Quantification of neonatal transport networks through network analysis: a new approach to studying neonatal regionalization	93.226	Beth Israel Deaconess Medical Center	1060852		$4,764
Quantifying the Fluctuations of Intrinsic Brain Activity in Healthy and Patient Populations	93.242				$250,731
Quantifying the sources and dynamics of tumor growth variability using Tuba-seq	93.398				$102,990
Quantitative 3D Diffusion and Relaxometry MRI of the Knee	93.846				$116,363
Quantitative Assessment of Early Metabolic and Biochemical Changes in Osteoarthritis	93.286				$76,916
Quantitative high-throughput nucleic acid assays on a sequencing chip	93.859				$337,968
Quantitative Imaging Biomarkers of Treatment Response and Prognosis in Breast Cancer.	93.398				$175,966
Quantitative Imaging of Cancer Drug Resistance via Radioluminescence Microarrays	93.394				$294,187
Quantitative PET/MRI of Brain Oxygenation in Cerebrovascular Disease	93.853				$101,095
QuBBD: Wearable artificial intelligence for big data-driven healthcare in child development	93.286				$524,969
Queries and Epidemiologic Studies	93.RD	Acumen, LLC.	FDA-2018-10020I-T02		$413,201
RabGEF1 in MyD88 signaling, skin immunity, and atopic dermatitis	93.846				$336,418
Race/Ethnicity, DNA Methylation, and Disparities in Cardiovascular Mortality: NHANES 1999-2002	93.307	University of Michigan	3004739345		$47,421
Radiation-Induced Tumor Cell Migration	93.395				$352,897
Radiogenomics framework for non-invasive personalized medicine	93.286				$521,244
Radioluminescence dosimetry solution for precision radiation therapy	93.395			$147,566	$353,568
Radiomics & Deep Learning Approaches for Screen Detected Lung Adenocarcinoma	93.396	Vanderbilt University	1028013-100-EAFGV; VUMC 61652		$39,925
Rapid Robust Pediatric MRI	93.286			$81,186	$633,796
Ras/MAPK Mutations Effects on the Developing Brain	93.865				$174,132
RCT of the Effectiveness of Stepped-Care Sleep Therapy In General Practice (RESTING)	93.866				$446,082
RCT on co-management of obesity, depression, and elevated CVD risk in primary care	93.837	University of Illinois at Chicago	1179680-100-EHBAV		($5,022)
RCT on co-management of obesity, depression, and elevated CVD risk in primary care	93.RD	University of Illinois at Chicago	16991		$100,316
Real-time biosensor for mapping the function of the pancreas	93.310				$1,250,339
Recipient Epidemiology and Donor Evaluation Study III (REDS III) - International Site (Task Order 2)	93.RD	The Johns Hopkins University	2003615108		$75,306
Recombinant Immunolabels for Nanoprecise Brain Mapping Across Scales	93.853	University of California, Davis	A19-1044-S003		$18,233
Reconstituting human pancreatic cancer development for translational research	93.396				$408,339
Reconstitution of Transcription Using TATA-less Promoters	93.859				$50,146
Reconstructing Primary Cilia	93.310				$145
Reducing Disparities in End of Life Cancer Care	93.307				$146,294
Reducing Risk: A Comprehensive mHealth Sleep Health Intervention for Adolescents at Risk for Depression and Anxiety Disorders	93.242				$135,458
Regulating Gli Function in Hair Follicle Progenitors	93.846				$232,560
Regulating the Coordination of Microtubule Organization and Cell Cycle State.	93.859				$16,526
Regulation of axon degeneration by the apoptotic pathway	93.853				$366,071
Regulation of Blood-Brain Barrier Function by the RECK/GPR124/Wnt7 Pathway	93.853				$374,056
Regulation of Cell-Type Specific Transcription in Spermatocytes	93.859				($30,542)
Regulation of gastrointestinal hormone signaling and metabolism by Neuromedin U	93.847				$556,078
Regulation of Hedgehog-dependent proliferation by dynamic primary cilia	93.859				$34,804
Regulation of Histone Deacetylases by mAKAP Signalosomes	93.837				$91,539
Regulation of immune cell metabolism in aging and Alzheimer's disease: role of the kynurenine pathway	93.866				$402,955
Regulation of Inflammation and Atherosclerosis by TCF21	93.837				$153,295
Regulation of mitochondrial motility and mitophagy by LRRK2	93.853				$258,926
Regulation of Muscle Stem Cell Fate	93.866				$382,122
Regulation of Signaling by Histidine Protein Methylation	93.859				$101,965
Regulation of Stem Cell Self-Renewal and Differentiation	93.859				$250,398
Regulation of synaptic transmission by retinoic acid signaling	93.242				($380)
Regulation of the DNA damage Response	93.113				$293,455
Regulation of the IgG Fc domain repertoire	93.855				$196,901
Regulators of Epidermal Gene Expression	93.846				$211,551
Regulators of Tumorigenesis	93.396				$268,237
Regulatory Impact on Vape Shop Marketing and Young Adults' Use of ENDS	93.393	Emory University	T921146		$129,382
Regulatory T cells in allogeneic transplantation	93.839				$3,667

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RegulomeDB: A Resource for the Human Regulome	93.172			$193,952	$726,636
Repair of mechano-electrical transduction in mammalian auditory hair cells	93.173	University of Kentucky	3048112318-15-204/7800002420		$38,394
Repertoire studies of human antibodies to RSV and MPV F	93.855			$100,927	$361,171
Reporter Gene Technologies for Integrated Cancer Diagnostics	93.394				$339,144
Repurposing systemic therapies to improve clinical outcomes in advanced basal cell cancer	93.398				$165,353
Rescuing Nucleic Acids from Formalin Damage in Cancer Specimens	93.394	Cell Data Sciences, Inc.	55314 122597 122580		$186,364
Research Career Development Institute for Psychiatry (R25)	93.242	University of Pittsburgh	0049415 (128103-1)		$82,895
Research Network on Decision Neuroscience and Aging	93.866			($3,075)	($3,075)
Research Opportunities in Comparative Medicine	93.351				$63,215
Research Training for Child Psychiatry and Neurodevelopment	93.242				$153,907
Resolving Ensemble Averaged Conformations by Multitemperature X-ray Crystallography	93.859	University of California, San Francisco	10531sc		$175,441
Response of cochlear hair cells to pathological changes in the auditory system	93.173				$679,074
Responsive Neurostimulation for Loss of Control Eating	93.853				$180,060
Retail Environment for Tobacco, Marijuana in California: Impact on College Student Use	93.393			$236,076	$588,435
Retinal Ganglion Cell Replacement in Optic Neuropathies	93.867			$383,913	$541,398
Retinal Optophysiology: recording neural activity by optical interferometry	93.867	University of California, Berkeley	00008815/PO# BB01134186		$203,695
Revealing circuit control of neuronal excitation with next-generation voltage indicators	93.242				$1,075,647
Reversal of Progenitor Cell Deficits in Diabetes	93.847				$158,103
Reverse Engineering the Alveolus: From cellular to microenvironment specification during development	93.837				$1,855
Reversible Acylation Reagents for Next-generation Biomolecule and Tissue Preservation	93.113	Cell Data Sciences, Inc.	127377		($10,525)
Reversing Cellular immortality in cancer	93.393				$994,137
Reversing epigenetic changes in aged microglia via young circulatory factors	93.866				$56,589
Revised- Molecular mechanisms of centriolar triplet microtubule formation	93.859				$48,877
Revolutionizing Biomedical and Clinical Research through Innovative Technology	93.172			$8,761	$163,788
RF-penetrable PET ring for acquiring simultaneous time-of-flight PET and MRI data	93.286				$428,864
Rheumatology Informatics System for Effectiveness Patient-Reported Outcome (RISE-PRO) Dissemination Project	93.226	University of California, San Francisco	11061sc		$104,463
Risk factor analysis of perioperative visual loss	93.RD	University of Illinois at Chicago	16815-02		$116,327
Rituximab for Treatment of SSc-PAH (ASC01) ¿ Mechanistic	93.855	University of California, San Francisco	9336sc		$74,874
Robust 1H MRSI of GABA, Glutamate, Glutamine, and Glutathione	93.242				$321,890
Robust Statistical Methods to Identify and Use Surrogate Markers in Diabetes	93.874	Rand Corporation	9920190021		$45,365
Role and Regulation of colon Trafficking Novel G-Protein Coupled Receptors	93.847			$82,071	$520,016
Role of beta-adrenergic receptors in modulation of cognition and central and peripheral immune systems in Alzheimer's disease	93.866				$343,852
Role of Dendritic Cells in Mixed Chimerism and Tolerance	93.855				$333,271
Role of extracellular matrix malleability in mediating breast cancer cell invasion and migration	93.396			$51,426	$408,938
Role of Glia in the Formation of Functional Synapses	93.279				$73,756
Role of growth and differentiation factors in retinal ganglion cell development	93.867				$28,553
Role of hemeoxygenase-1 in experimental acute pancreatitis	93.847				$523,360
Role of IgG Fc glycan composition in vaccination	93.855	The Rockefeller University	5U19AI111825-05- 2		$35,722
Role of Immune Cells in Chronic Pancreatitis	93.847				$418,114
Role of long non-coding RNAs in sarcoma pathogenesis	93.393	University of California, San Francisco	10160sc		$12,952
Role of L-type Calcium Channels in Human Interneuron Migration and Integration	93.242				$709,063
Role of miR25 in Heart Failure	93.837	Icahn School of Medicine at Mount Sinai	0255-8251-4609		$139,916
Role of Myeloid Derived Suppressor Cells in the Immune Response to Surgery	93.859				$709
Role of nociceptive sensory neuron/mast cell interactions in cutaneous allergic inflammation	93.855				$417,550
Role of novel adherens junction proteins in susceptibility to S. aureus alpha-toxin	93.855				$101,532
Role of Nucleus Accumbens and Its Glutamatergic Inputs in High-Fat intake	93.847				$82,973
Role of PAR-1 Kinase in Synaptogenesis	93.242				$318,160
Role of SETD5 in Chromatin Regulation and Tumorigenesis	93.393	University of Texas MD Anderson Cancer Center	3001326346		$62,364
Role of SMAD3 in Smooth Muscle Phenotypic Modulation and its role in Coronary Artery Disease	93.837				$54,204
Role of Soluble Adenylate Cyclase in Reactive Astrocytes	93.867				$17,993
Role of the Centrosome in Dedifferentiation	93.859				$36,223
Role of the F-Bar-Protein CIP4 in Cardiac Hypertrophy	93.837				$470,239
Role of the METTL13 Lysine Methyltransferase in Signaling and Cancer	93.396				$250,589
Role of the Parathyroid Hormone Receptor in Osteoblast Support of Erythropoiesis	93.847				$87,432
Role of Transglutaminase 2 in Celiac Sprue	93.847			$231,630	$713,083
Role of Wnt-responsive cells in oral mucosa homeostasis, injury, and malignancy	93.121				$33,858
Roles for microRNA-122 and circular RNAs in flavivirus RNA amplification	93.855				$612,686
RPE Energy Metabolism and Cell Phenotype	93.867				$354,452
S18-028 - Human Tumor Atlas Project	93.RD	Broad Institute, Inc.	5500001187		$145,475
Safety Research of Currently Recommended Immunizations: Identifying Genetic, Immunologic and Clinical Factors Predisposing to Adverse Events after MMR Vaccine	93.RD	Kaiser Permanente	209324-01		$157,654
Scalable Coalescent Inference for Large Data Sets	93.859				$372,701
SCH: INT: Collaborative Research: Intelligent Information Sharing: Advancing Teamwork in Complex Care	93.396	Harvard University	123977-5100528		$237

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SCH: INT: Collaborative Research: Intelligent Information Sharing: Advancing Teamwork in Complex Care	93.396			$122,606	$358,134
SCIENTIFIC LEADERSHIP NIH National Clinical Trials Network (NCTN) Grant (U10CA180886) successor to NIH COG Chair Grant (U10CA098543)	93.395	Children's Hospital of Philadelphia	FP00015221_SUB781_01-4		$16,987
Selection of New rAAV Vectors Using Replicating Viral Capsids Libraries	93.855				$472,927
Selective Halogenation Reactions for the Synthesis of Chiral Bioactive Small Molecules	93.859				$126,671
Selective Strategies for Mycobacterial Cell Wall Labeling	93.859				$58,192
Self-Management of Type 1 Diabetes During Adolescence	93.RD	Cincinnati Children's Hospital Medical Center	138450; PO# 3100489454		$9,593
Self-Motile Electrodes for Three Dimensional, Non-perturbative Recording and Stimulation	93.867				($615)
Sequelae and immunopathology of Ebola virus infections	93.RD			$13,792	$762,705
Severe Maternal Morbidity: An Investigation of Racial-Ethnic Disparities, Social Disadvantage & Maternal Weight	93.361			$71,875	$452,804
Sex hormone effects on neurodevelopment: Controlled puberty in transgender adolescents	93.242				$452,627
Shear and Light-Sheets to Study Cardiac Trabeculation	93.837	University of California, Los Angeles	1564 G TA493		$135,185
Short Courses in Neuroeconomics and Social Neuroscience	93.866	Duke University	309-0075 309-0091		$19,920
Sigma-1 Receptors: A Novel Clinical Target in Fragile X Syndrome	93.865				$14,263
Signal Transduction by Oxysterols	93.859				$102,759
Signaling mechanisms Controlling Planar Cell Polarity	93.859				$224,950
Signaling Pathways in MDS	93.847			$247,601	$398,199
Simtk.org: A Resource to Enable Collaboration & Reproducibility of Biosimulations	93.859				$64,591
SimTK: An Ecosystem for Data and Model Sharing in the Biomechanics Community	93.859				$362,188
Single Cell Characterization of Latent HIV-1 Reservoirs	93.855	University of California, San Francisco	9815sc		($117,942)
Single cell epigenomics in cancer immunity and immunotherapy	93.398				$159,819
Single Cell Sequencing of Human iPSC-CM Subtype Identity and Function	93.837				$100,053
Single molecule imaging of Ascl1 during neuronal reprogramming	93.853				$56,090
Single molecule studies of SNARE-induced vesicle fusion	93.242				$565,202
Single Session Pain Catastrophizing Class: Efficacy & Mechanisms for Reducing Opioid Use Among Chronic Pain Patients	93.279				$33,063
Single Session Pain Catastrophizing Treatment: Comparative Efficacy & Mechanisms	93.213				$805,287
Single step strategy for the therapeutic reprogramming in Epidermolysis Bullosa patients	93.846				$86,679
Single synapse analysis of synaptic plasticity by combining electrophysiology and array tomography	93.242				$562,786
Single-cell analysis and synthetic control of mammalian chromatin dynamics and gene regulation	93.859				$332,929
Single-cell analysis of alterations in signaling dynamics that impair cellular proliferation during aging	93.866				$37,235
Single-Cell High-Dimensional Characterization of the Bone Marrow Microenvironment in Health and Disease	93.866			$34,279	$194,427
Single-Molecule Analysis of DNA Secondary Structures during DNA Replication	93.859				$209,837
Single-Molecule Imaging for Cell Biology and Super-Resolution Microscopy	93.859				$678,079
Sleep and Circadian Dysregulation in Pediatric Bipolar Disorder	93.242				$51,820
Small molecule neurotrophin receptor ligands to treat Alzheimer's disease	93.866				$142,334
Small Molecule NOTCH Inhibitors for the treatment of pulmonary hypertension	93.837			$45,833	$94,821
Small non-coding RNA regulation of RAS GTPase function in epidermal homeostasis	93.846				$145,510
Small RNA regulation of gene expression in Entamoeba	93.855				$692,983
Social Disparities in NICU Care	93.865			$243,518	$744,749
Social Insurance Design and International Differences in Health at Older Ages	93.866	National Bureau of Economic Research	41730.Stanford		$63,235
Social Media Intervention to Promote Smoking Treatment Utilization and Cessation Among Alaska Native Smokers	93.279	Mayo Clinic	BOA239893PO6593639 8PO66578893		$22,369
Social Media Technology for Treating Tobacco Addicition	93.393	University of California, Irvine	2016-3319		$122,873
Socioemotional Functioning in Adulthood and Old Age	93.866				$523,170
SOFTWARE FOR LARGE-SCALE INFERENCE OF THE GENETICS OF LIFESTYLE MEASURES, BIOMARKERS, AND COMMON AND RARE DISEASES	93.172				$311,865
Software tool for routine, rapid, patient-specific CT organ dose estimation	93.286	Marquette University	70304-004-03		$25,275
Solid-state patch clamp platform to diagnose autism and screen for effective drug	93.242				$48,756
Somatic Mosaicism in the Brain of Tourette Syndrome	93.242	Yale University	1049579-102-KARRH GR105849(CON-80001722)		$336,389
Spatial Epigenomic Profiling of Immune Cell Signatures at Subcellular Resolution in Health and Disease	93.855				$115,451
Spatial Patterning Modulates Tissue Revascularization and Regeneration	93.837				$116,788
Spatially-resolved proteomic mapping of living cells	93.310				$645,116
Specialized filopodia in long range cell signaling and vertebrate tissue patterning	93.865				$364,763
Specialized ribosomes in control of gene expression and embryonic development	93.310				$287
Spectroscopic Characterization of Oxygen Intermediates in Non-heme and Heme Iron Enzymes	93.859				$314,036
Spectroscopic Photoacoustic Molecular Imaging for Breast Lesion Characterization	93.286				$31,931
Spectrum Stanford Center for Clinical and Translational Research and Education	93.350				$2,326,180
Spleen glia in autonomic regulation of immunity	93.853			$18,173	$39,951
SPORE Pathology Tissue Core	93.397	Sarcoma Alliance for Research through Collaboration	1U54CA 168512-01		$20,173
Sputum Transcriptomic Expression Profiling in Study 31: Express 31	93.855	University of California, San Francisco	10337sc		$103,132

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Stanford Advanced Wound Care Center Clinical Research Unit	93.847				$516,983
Stanford Aging & Ethnogeriatrics) Transdisciplinary Collaborative Center	93.866				$104,991
Stanford Alzheimer's Disease Research Center	93.866			$169,531	$1,406,135
Stanford Cancer Imaging Training (SCIT) Program	93.398				$222,052
Stanford Cancer Institute	93.397				$3,602,837
Stanford Career Development Program in Omics of Lung Diseases	93.837				$192,761
Stanford Center for Undiagnosed Diseases	93.310			$63,165	$791,897
Stanford ChEM-H Chemistry/Biology Interface Predoctoral Training Program	93.859				$171,096
Stanford Cooperative Research Center for Novel, Alternative Model Systems for Enteric Diseases	93.855			$175,909	$997,199
Stanford Diabetes Research Center	93.847				$1,638,485
Stanford Effort for NCATS Knowledge Translator	93.350				$357,399
Stanford Health Services Research Training Program	93.225				$204,099
Stanford Human Cancer Models Initiative Center	93.RD	Leidos Biomedical Research Inc.	19X015Q		$110,770
Stanford Molecular and Cellular Characterization Laboratory Supplement Boston	93.396				$847,030
Stanford Molecular Imaging Scholars (SMIS)	93.398				$309,540
Stanford MoTrPAC Bioinformatics Center	93.310				$1,801,249
Stanford Neuroscience Research Cores for Gene Vectors, Microscopy, and Behaviors	93.853				$562,979
Stanford Neurosurgery Resident Research Education Program	93.853				$122,579
Stanford Precision Health for Ethnic and Racial Equity (SPHERE) Transdisciplinary Collaborative Center	93.307			$219,274	$2,259,803
Stanford Technology Accelerating Medicines Partnership Center	93.846				$227,132
Stanford Tissue Mapping Center	93.310			$16,655	$651,721
Stanford Training Program in Aging Research	93.866				$277,276
Stanford Training Program in Lung Biology	93.837				$337,174
Stanford Undergraduate URM Summer Cardiovascular Research Program	93.837				$53,827
Stanford University NCTN- Network Lead Academic Site	93.395				$290,381
Stanford University Regional Coordinating Stroke Center for the NIH Stroke Trials Network	93.853				$369,603
Stanford Vision Research Core	93.867				$684,232
Stanford Vision Training Program	93.867				$103,218
Stanford/Salk MoTrPAC Site for Genomes, Epigenomes and Transcriptomes	93.310			$182,910	$1,568,154
Stanford-Colombia Collaboratory on Chronic Disease Prevention	93.397			$61,550	$194,464
Staphylococcus serine hydrolases as targets for therapeutic and imaging contrast agents	93.286				$464,380
Statins augment small vessel function and improve stroke outcomes (SALVO)	93.853	Massachusetts General Hospital	228383		$20,366
Statistical Methods for Optimizing Personalized Treatment Selection	93.837			$90,468	$110,700
Statistical methods for personal genome interpretation: genome variation, transcriptome variation, and their combined effects on complex traits	93.172				$140,613
Stem Cell Biology, Cancer Stem Cell Biology, and Cancer Immunotherapy	93.396				$1,078,324
Stem Cell-Based In vivo Models of Human Genetic Liver Diseases	93.847				($4,708)
Stepped--caremanagement of insomnia co-occurring with sleep apnea	93.838	National Jewish Health	20107402_Stanford Sub 20107403_Stanford Sub 20107404_Stanford Sub		$331,075
Storage and recall of human B cell memory of influenza over tissues and time	93.855			$29,627	$495,996
Strategies for tuberculosis control in prisons	93.855			$269,532	$592,615
Strength Training Regimen fOr Normal weiGht Diabetics (STRONG-D)	93.847			$36,660	$634,785
Stroke Hyperglycemia Insulin Network Effort (SHINE)	93.853	University of Michigan	3004208234-SHN		($54)
Stromal Regulation of Basal Cell Carcinoma Formation	93.846				$411,114
Structural and dynamic analysis of GRK interaction with G protein-coupled receptors	93.837	Thomas Jefferson University	080-02000-S29101,PO2000077205		$389,536
Structural and Functional Characterization of the Ebola Virus Replication Complex"	93.855	Washington University in St. Louis	WU-18-66 / PO #2934346E		$201,258
Structural and functional tests of ganglion cell damage in glaucoma	93.867				$85,863
Structural and molecular identification of circuitry underlying joint processing of motivation and aversion	93.279				$717,412
Structural Basis of Opioid Receptor Function	93.279			$141,658	$559,209
Structural Basis of Signal Instigation Through Metabotropic Glutamate Receptors	93.853			$5,193	$957,343
Structural basis of substrate processing in modular polyketide synthases	93.859			$61,272	$263,007
Structural Biology Center for HIV/Host Interaction in Trafficking and Assembly	93.859	University of Utah	10044932-04; PO# U000174110		$293,610
Structural Cell Biology of DNA Repair Machines	93.393	Lawrence Berkeley Laboratories, University of California	7336091		$52,990
Structural correlates of T cell receptor signaling	93.855				$247,796
Structural Dynamics and Mechanochemical Coupling in DNA Gyrase	93.859				($9,441)
Structural interrogation of the HIV - 1 5' leader by multidimensional chemical mapping and integrative modeling	93.855				$179,198
Structural Motifs in RNA	93.172			$189,535	$419,466
Structure and Dynamics of GPCR-G protein complexes	93.859	University of California, San Diego	PO # S9001445, 78010612		$257,612
Structure and Function of Calpain-5	93.867			$80,241	$567,074
Structure and function of EBV protein complexes that trigger epithelial cell entry.	93.855	Northwestern University	60049111 SU		$367,467
Structure and function of HCMV gHgL complexes	93.855				$43,050
Structure and Function of SWEET Sugar Transporters	93.859				$418,225
Structure and Function of the Hepatitis C Virus Genome	93.855				$342,542
Structure and mechanism of the centrosome-cilium complex	93.859				$327,991
Structure of RNA Polymerase II	93.859				$204,696
Structure of the Eukaryote Transcription Apparatus	93.855				$35,273
Structure, function and engineering of immune cytokine receptor signaling	93.855				$608,159
Structure, Mechanism, and Engineering of Assembly Line Polyketide Synthases	93.859				$361,819
Structure/Function Correlations Over Copper Enzymes	93.847				$643,184

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Structure-based Bioengineering of Wnt Surrogates for Intestinal Stem Cell Biology and Therapy	93.847				$814,964
Structure-based discovery of allosteric ligands for G Protein Coupled Receptors	93.859			$78,184	$195,596
Structure-based vaccine design for hepatitis C virus	93.855	University Of Maryland At College Park	50917-Z0022201		$198,483
Substance Abuse Treatment to HIV Care (SAT2HIV)	93.279	Research Triangle Institute	8-312-0214650; PO# 65422L		$217
Suppression of basophil activation by IgE glycovariants	93.838			$116,709	$515,618
SURPASS: (Statin Use and Risk Prediction of Atherosclerotic Cardiovascular Disease in minority Subgroups)	93.837				$93,370
SWOG Network Group Operations Center of the NCTN	93.395	Oregon Health & Science University	9009627_STANFORD		$9,627
Synapse Remodeling and Neuronal MHC Class I	93.242				$642,591
Synaptic Specializations in Auditory Hair Cells	93.173			$58,021	$430,111
Synaptomes of Mouse and Man	93.853	Allen Institute for Brain Science	2017-0404-02 PO AIP050743		$113,069
Synthesis of New Bis-Guanidinium Toxins and Investigation of their Voltage-Gated Sodium Ion Channel Affinity	93.859				$58,052
Synthetic Biology Platforms for Natural Product Discovery and Biosynthesis	93.213				$439,984
Synthetic Studies Related to Cancer Research/Treatment	93.395				$263,622
Systematic approaches to deciphering cis regulation of A-to-I RNA editing	93.859				$351,970
Systematic characterization of trans regulation of A-to-I RNA editing in neurons	93.242				$332,266
Systematic Functional Annotation of Human Cis-Regulatory Genetic Variation	93.310				$62
Systems analysis of innate responses to malaria infection	93.855	Icahn School of Medicine at Mount Sinai	0255-8673-4609		$150,189
Systems Analysis of the Impact of the microbiome on immunity to vaccination in humans (Pilot 1)	93.855	Icahn School of Medicine at Mount Sinai	0255-8673-4609		$148,473
Systems Approach to Immunity and Inflammation Core E - CvTOF Flow Cytometrv	93.855	The Scripps Research Institute	Sub 5-53339 5-53340 5-53880 5-53837 5-53838		$614,886
Systems Biology of Collective Cell Decisions	93.859			$41,075	$92,954
Systems Modeling Guided Bone regeneration	93.846	The University of Texas Health Science Center at Houston	0013113A		$276,799
Systems Modeling Guided Bone regeneration	93.855	Cincinnati Children's Hospital Medical Center	Subaward 138679/ PO3100594845		$15,816
Systems Pharmacological Analysis of Drug Efficacy in Inflammatory Bowel Disease	93.855				$44,562
T Cell Immunity in Giant Cell Arteritis	93.837				$225,886
T Cell Reagent Research for Monitoring T-Cells in Food Allergy	93.855				$325,055
Targeted Advertising for Cancer Prevention	93.310				$293,886
Targeted, wireless neural stimulation with near-infrared light absorbing carbon nanotubes	93.286				($242)
Targeting B Cell MicroRNA in Post-Transplant EBV-Associated B Cell Lymphoma	93.855				$10,104
Targeting cardiovascular events to improve patient outcomes after sepsis	93.837	Boston University	4500002816		$49,564
Targeting Dectin-2 on tumor-associated macrophages for the treatment of cancer	93.395				$607,940
Targeting DNA Demethylation Regulators in Osteoarthritis	93.846				$349,499
Targeting glucose metabolism for the treatment of Hepatocellular Carcinoma	93.350	Michigan State University	RC108590SU		$166,899
Targeting glucose metabolism for the treatment of Hepatocellular Carcinoma	93.350	University of California, San Francisco	10231sc		($1,440)
Targeting Inflammation and Alloimmunity in Heart Transplant Recipients with Tocilizumab	93.855	Massachusetts General Hospital	232560		$6,354
Targeting natural killer cells to HIV in intravenous drug users	93.279				$556,495
Targeting Novel BMPR2 modifiers in Pulmonary Hypertension with Repurposed Drugs	93.838				$449,557
Targeting reactive aldehyde metabolism in endometriosis as a treatment strategy and a diagnostic biomarker	93.865				$92,065
Targeting Senescence pathways in Alzheimer's disease	93.866				$419,705
Targeting STT3A and STT3B to Block Flavivirus Replication	93.855	New England Discovery Partners, LLC.	4531-01Stanford		$38,787
Targeting the cancer glycocalyx	93.859				$256,151
Targeting the kynurenine pathway in Alzheimer's disease	93.866				$396,651
Targeting the Major Histocompatibility Class I-LILRB1 signaling axis for cancer immunotherapy by macrophages	93.398				$43,039
T-cell monitoring and immunotherapy for treating graft-versus-host disease	93.839				$112,774
TCPI Support and Alignment Network	93.639	American College of Physicians	TCPISAN-100-C		$2,808
Technologies to drastically boost photon sensitivity for brain-dedicated PET	93.286				$605,481
Technology development for point-of-care detection and antimicrobial susceptibility testing of Neisseria gonorrhoeae	93.855	The Johns Hopkins University	2004139484		$120,445
Technology Innovations for Supporting Health in Alaska Native People - Diversity Supplement	93.837			$339,493	$528,257
Technology to Improve Eating Disorders Treatment	93.242	Washington University in St. Louis	WU-14-54 /PO 2922705X		$3,471
Technology-Enabled Therapy for Elders with Insomnia and Comorbid Mild Cognitive Impairment	93.866	Environment and Health Group, Inc.	Grant# 1R43AG058334-01A1		$72,955
TELmisartan plus EXercise to improve functioning in PAD: The TELEX Trial	93.837	Northwestern University	60040922 STAN		$23,408
Telomere Damage Responses and Immune Aging	93.855				$411,446
Telomere Length as Mediator Between Early Life Stress and Child Health Outcomes	93.242				$3,475
Templated Chemistry for RNA Analysis	93.859				($355)
Tension-dependent regulation of alpha-catenin during morphogenesis in C. elegans	93.859	University of Wisconsin-Madison	807K240		$95,051
Testing combinations of population interventions to encourage healthy eating	93.847			$90,575	$356,277
Text Mining for High-fidelity Curation and Discovery of Gene-drug-phenotype Relationships	93.879			$86,502	$644,780
TGF-Beta Mediated Inflammatory Signaling: A Critical Role in Epileptogenesis	93.853	University of California, Berkeley	00008681/PO# BB00580365		($1,286)

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Th SMAD3 signaling network in coronary artery disease risk	93.837				$508,228
Thalamic Circuits for Prosocial Behaviors in Mice	93.242				$523,185
Thalamic Circuits Underlying Opioid Seeking	93.279				$452,528
Thalamic Contributions to Functional Network Abnormalities in Alzheimer's Disease	93.866				$17,267
The 200 mammals project: sequencing genomes by a novel cost-effective method, yielding a high resolution annotation of the human genome	93.172	Broad Institute, Inc.	5000530-5500000906		$156,875
The aged systemic milieu inhibits hippocampal neurogenesis and cognition through VCAM1	93.866				($53)
The Atrial Fibrillation - Factor Identification to Risk Modification Study in HD103080	93.847	Baylor College of Medicine	PO # 7000000015		$19,625
The biophysics of skin-neuron sensory tactile organs and their sensitivity to mechanical and chemical stress	93.853				$785,911
The Bio-Tinkering Playground	93.859	The Tech Museum of Innovation	8R25GM129220-02		$61,997
The BMP-PPARgamma Axis and Pulmonary Hypertension	93.838				$422,750
The Cellular Geography of Therapeutic Resistance in Cancer	93.353	Dana-Farber Cancer Institute (505)	1206301		$152,936
The Center for HIV RNA Studies (CRNA)	93.859	University of Michigan	3004815634 P.O. 3005149261	$29,332	$192,327
The Colon Microbiome in Dialysis Patients	93.847				$76,589
The Contribution of T cells to the Pathogenesis of Atherosclerosis in Older Adults	93.866				$113,134
The Cosmos/Vue Smart Eyeglass -HAM System Phase IIB	93.866	Gen-9, Inc.	SPO# 127056		$25,457
The Development of 4-methylumbelliferone Pro-drugs to Prevent Autoimmune Diabetes	93.847				$488,949
The Dynamics of Human Atrial Fibrillation	93.837			$115,778	$221,974
The Dynamics of Molecular Recognition by Proteins: An Integrated Approach using 2D IR Spectroscopy and Molecular Dynamics Simulations	93.859	University of Chicago	FP061436		$110,706
The Effect of Estrogen on Cardiac Arrhythmic Propensity	93.837				$5,414
The effect of vitamin D3 on markers of oxidative stress in boys with X-linked ALD	93.853			$9,594	$254,850
The Epidemiology and Economics of Chronic Back Pain	93.279				$175,984
the Ethics of Inclusion: Conceptualizing Diversity in Genomics Research	93.172				$29,927
The Genetic Architecture of Human Facial Morphology	93.121	University of Pittsburgh	CNVA00055576 (129868-1)		$54,299
The genome architecture of rapid adaptation in Drosophila melanogaster	93.859				$40,675
The Harvard Clinical and Translational Science Center (SMART IRB Ambassador)	93.350	Harvard University	153185.5110601.0104		$35,163
The impact of early medial temporal lobe Tau in human cognitive aging	93.866				$230,523
The Impact of Epstein Barr Virus Infection on the Immune Response in Pediatric Transplant Recipients	93.855			$48,456	$455,891
The Impact of FUS-Mediated Brain Cancer Therapy on BBB Transport, Cytokines, and Immunocyte Trafficking	93.394			$382,021	$745,098
The impact of glomerular disorders on bone quality and strength	93.847	Columbia University	4(GG015009-01); G13413		$9,165
The Impact of Local Coverage Determinations on Costs and Patient Outcomes	93.866	National Bureau of Economic Research	4029E.22.00.01-Stanford		$1,162
The Impact of Mitochondrial Repression and Lipid Accumulation by HIF on Tumor Growth	93.396			$144,966	$785,110
The Impact of Opioids on Chronic Pain: Clinical Research and Career Training in Spinal Cord fMRI and Brain Reward Systems	93.279				($4,276)
The Impact of School Water Access on Child Food and Beverage Intake and Obesity.	93.837			$480,903	$965,853
The influence of health and neighborhood context on economic mobility: Evidence from a social experiment	93.865	University Of Minnesota	H006124303		$47,421
The influence of multi-domain cognitive training on large-scale structural and functional brain networks in MCI	93.866				$220,261
The Insulin-Only Bionic Pancreas Bridging Study	93.847	Jaeb Center for Health Research	DexCom Supplies		$12,249
The Ionic Basis of Spatial Codes in Medial Entorhinal Cortex	93.242				$486,613
The LIFE Study	93.866	University of Florida	UFDSP00010687 Project 00120769		$8,396
The long-term health effects of the New Deal: An 80 year follow-up of 4 cohorts	93.866			$14,960	$238,621
The Lung PCA: A Multi-Dimensional Atlas of Pulmonary Premalignancy	93.353	Boston University	4500003003		$149,933
The Maintenance of Human Atrial Fibrillation	93.837				$182,502
The neural functions of Rai1, the causal gene for Smith-Magenis Syndrome	93.865				$104,012
The NOTCH Signaling Pathway in Large Vessel Vasculitis	93.837			$23,751	$399,617
The paradoxical role of CDKN2B in blood vessel sprouting and maturation	93.837				$41,936
The Phenotypic Landscape of Cognitive Decline as Revealed by Next-Generation Multiplexed Ion Beam Imaging	93.866			$29,023	$761,443
The PIP2-Virus Interface and PI 4-Kinase: Novel Biology and Validation Targets	93.855				$76,420
The prognostic landscape of gender- and ethnicity-specific immune influences on cancer outcomes	93.393				$40,229
The Radiation Planning Assistant (RPA) for Radiation Therapy in Low- and Middle-Income Countries	93.395	University of Texas MD Anderson Cancer Center	3001270893		$54,146
The Referral and Follow-up Patterns of High-Risk Infants	93.865				$50,699
The rhythms of chronic pain: Developing technology for measuring, modeling, and predicting individualized pain patterns in everyday life	93.866	Weill Medical College of Cornell University - New York	183137-P2		$30,823
The Role of Adenosine Kinase in Controlling Beta-Cell Regeneration	93.847				$473,490
The Role of Caregiver Social Processes on Neural and Endocrine Function in Infants	93.242				$153,856
The role of CDKN2B in efferocytosis and atherosclerosis	93.837				$192,108
The Role of Chemotaxis in Helicobacter pylori Distribution in the Host	93.847	University of Oregon	215480A		($418)
The Role of Chromatin in Metabolic Homeostasis	93.859				$354,950
The role of circulating Slit2 in adipose thermogenesis and diabetes	93.847				$317,785
The role of extracellular signaling in mechanisms of drug resistance in basal cell carcinoma	93.398				$31,518
The role of FL2 in Cavernous Nerve Repair in an Animal Model of Radical Prostatectomy	93.RD	Albert Einstein College of Medicine	310235 - P0666048/P0704068 310235 - PO724057		$54,057
The Role of GABA Co-release from Dopamine Neurons in Ethanol Consumption	93.273				$20,028

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The Role of Inflammation in Cardiovascular Disease	93.837	Vanderbilt University Medical Center	1044460-104-NAAQZ VUMC59050 VUMC62891		$348,084
The Role of Leiomodin1 in Vascular Disease	93.837				$111,175
The Role of Membrane Curvature in Surface Nanotopography-Induced Cell Functions	93.859				$288,169
The role of Myt1l in the developing and adult mouse brain	93.242				$274,376
The role of Nkx2-1 in the distal lung	93.838				$10,883
The role of Nrg1 signaling in Schwann cell development and myelination	93.853				$16,927
The role of oxidative stress in the pathogenesis of Reticular Dysgenesis and the therapeutic potential of antioxidants	93.855				$211,472
The Role of Patterned Spontaneous Network Activity in Motor Circuit Activity	93.853				$65,987
The role of primary cilia in glaucoma pathogenesis	93.867				$548,471
The Role of Risk and Benefit Perceptions in Tobacco Control and Product Usage	93.399	University of California, San Francisco	8132sc		($42)
The Role of Sarcomeric Protein Alignment in Connexin 43 Localization at Gap Junction	93.837				$58,492
The role of small RNA derived tRNAs in gene regulation: Mechanism and Therapeutic Applications	93.847			$27,795	$538,888
The Role of Somatic Mutations in Malformations of Cortical Development	93.853	Columbia University	2(GG012194-01)		$28,459
The role of TCF21 in coronary heart disease	93.837				($30,978)
The role of the gut microbiome-host metabolome interactions in heart failure-related insulin resistance	93.837				$55,092
The role of the Wnt5a/ROR2 in the pathogenesis of pulmonary arterial hypertension	93.837				($3,286)
The role of TREM1 signaling in the development of Alzheimer's disease	93.866				$243,977
The Roles of Inflammatory and Glutamatergic Processes in the Neurodevelopmental Mechanisms Underlying Adolescent Depression	93.242				$158,513
The Stanford Extreme Phenotypes in Alzheimer's Disease (StEP AD) Cohort	93.866			$352,502	$671,756
The Stanford SLAC CryoEM Center	93.310				$1,951,326
The Stanford Training Program in ELSI Research	93.172				$311,858
The TOPAS Monte Carlo simulation toolkit for physics, biology and clinical research in radiotherapy	93.395	University of California, San Francisco	10824SC		$305,352
The Tuskegee Syphilis Study and the Health of Black Men	93.307			$25,544	$117,583
The Ubiquitin Proteasome System in ER Quality Control	93.859				$262,888
The use of human iPSC-derived cardiomyocytes to describe the role of ¿-Tropomyosin mutations in hypertrophic cardiomyopathy	93.837				$83,670
The Vascular Effects of Infection in Pediatric Stroke (VIPS II) Study	93.853	University of California, San Francisco	10590SC 11261sc		$58,064
The WHI Strong and Healthy SilenT Atrial fibrillation Recording study (WHISH STAR)	93.837			$210,076	$1,085,670
The WISER Study	93.865			$226,892	$466,263
The Wnt7a/ROR2 axis in the pathogenesis of pulmonary arterial hypertension	93.838				$495,291
Therapeutic Development of RNAi-Based Inhibitors Against the Hepatitis Delta Virus	93.855	SomaGenics Inc	2R44AI104007-02A1		$49,496
Therapeutic dissection of genotype-specific lung cancer vulnerabilities	93.398				$12,704
Therapeutic Exploitation of IPSE, a Urogenital Parasite-Derived Host Modulatory Protein, for Chemotherapy-Induced Hemorrhagic Cystitis	93.847	Biomedical Research Institute	BIG-100		$68,882
Therapeutic miRNA Modulation of Hepatocellular Carcinoma Using Ultrasound Guided Drug Delivery	93.394				$606,910
Therapeutic Strategy for Lymphangioleiomymoatosis (LAM) and Tuberous Sclerosis	93.350	Baylor College of Medicine	PO# 7000000246		($656)
Three-Dimensional Structure of Eukaryote Chromosomes	93.847				$1,534,228
Three-dimensional super-resolution imaging and tracking of disease and treatment mechanisms of progeria	93.859				$6,772
Thumb CMC Biomechanics and Early OA Progression	93.846	Rhode Island Hospital	7017137231		$205,898
Timing of Inguinal Hernia Repair in Premature Infants: A Randomized Trial	93.RD	Vanderbilt University Medical Center	VUMC 53267		$27,240
Tissue Chip Modeling of Synovial Joint Pathologies: Effects of Inflammation and Adipose-Mediated Diabetic Complications	93.350	University of Pittsburgh	0056727 (131589-2) 0056727 (1298942)		$177,508
Tissue Chips for Multipotent Stromal Cell Manufacturing (PI: Ngan Huang/Stanford)	93.103	University of California, San Francisco	Master 9803sc		$697,284
Tissue Cytokine Sequestration and Immune Regulation in Autoimmunity	93.855				$593,512
Tissue engineering approaches for improved treatment of early stage osteonecrosis of the hip	93.846				$579,342
Title Optimizing a Smartphone Application for Individuals with Eating Disorders	93.242	Recovery Record, Inc.	115760		$42,695
TOGETHER: Track Outcomes & Guidance, Enabled Technology for Health & Effective Resources	93.RD	Medable, Inc.	133314,HHSN261201700030		$20,095
Tolerance to Combined Kidney and Bone Marrow Transplants from Deceased Donors after TLI and ATG Conditioning	93.855	Benaroya Research Institute at Virginia Mason	1010711-100-HAIGK/FY18ITN197		$23,201
TOPAS - nBIO, a Monte Carlo Tool for Radiation Biology Research	93.395	Massachusetts General Hospital	Subaward 226035		$4,175
Toward improved understanding of sex differences in drug response: developing gene and pathway-based informatics methods to examine sex-differential genetic effects	93.879				$11,695
Toward optimizing diabetes care in persons with chronic kidney disease	93.847				$162,027
Towards a Complete Description of the Circuitry Underlying Sharp Wave-Mediated Memory Replay	93.853			$1,208,137	$3,229,938
Towards automated phenotyping in epilepsy	93.853				$190,291
Towards optimizing care for cardiovascular disease in chronic kidney disease	93.847				$11,900
Toxoplasma rhoptry function	93.855				$345,266
Tracking HIV Infection and Alcohol Abuse CNS Comorbidity with Neuroimaging	93.273	SRI International	PO32128		$236,054
Tracking hospital acquired infections using advanced metagenomics tools	93.RD				$140,344
Tracking the invaders in multiple sclerosis: Highly specific TREM1-targeted PET imaging of toxic infiltrating myeloid cells and early treatment response.	93.853				$208,073
Training Grant in Academic Gastroenterology	93.847				$215,310
Training in Myocardial Biology at Stanford (TIMBS)	93.837				$358,974
Training in Pediatric Nonmalignant Hematology and Stem Cell Biology	93.847				$204,023
Training Program in Adult and Pediatric Rheumatology	93.846				$362,722
Training Program in Basic Neuroscience	93.242				$644,815

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Training Program in Hematopoietic Cell Transplantation	93.839				$50,850
Training Research Leaders in Type 1 Diabetes	93.847				$52,002
Transcription factor control of Entamoeba development	93.855				$3,018
Transcription Factors in Intestinal Differentiation and Cancer	93.398				$77,940
Transcriptional Regulatory Complexes in Epidermal Differentiation	93.846				$90,576
Transcription-Associated Genome Instability	93.859				$340,237
Transformative Computational Infrastructures for Cell-Based Biomarker Diagnostics	93.350	J. Craig Venter Institute	JCVI-16-009 072005 (16-008)		$157,862
Transfusion of Prematurity Early School Age Follow up (TOP 5) CCC	93.839	University of Iowa	S00706-01		$10,106
Transgenerational epigenetic inheritance of longevity	93.310				$80
Transgenic mice and multiplexed, multi-beam instrumentation for large-scale optical experiments on brain states and ensemble cellular dynamics in behaving animal	93.853			$42,095	$633,396
Translating Clinical Decision Making into Systems of Care: A Mid-Career Mentor	93.837				$120,054
Translational Studies of Brain Circuitry Disrupted by Alcoholism	93.273				$19,991
Trans-omics elucidation of genetic architecture underlying cardiovascular and HLBS diseases	93.837				$32,668
Trans-synaptic bidirectional tracing tools for imaging and omics analysis	93.242				$802,430
Trial Net Screening and DPT-1 Follow Up Studies	93.RD	University of South Florida	PO 261241; 253349		$31,942
TrialNet at Stanford University	93.847				$494,596
Trigger waves and coupled oscillations in the embryonic cell cycle	93.859				$307,302
Tumor DNA in CSF and novel modeling decode breast cancer - brain metastases	93.853				$228,085
Tumor Hypoxia: Molecular Studies & Clinical Exploitation	93.395			$262,001	$411,287
Tweet4Wellness: Development and RCT of Mobile Social Support Groups for Sedentary Behavior Reduction	93.837				$152,856
Type 1 Diabetes and the Brain in Children: Metabolic Interventions	93.865	Nemour Children's Hospital	3002224007/PO# 524415-0-RSUB		$622,134
U54 (PI Perera) African American Cardiovascular Pharmacogenetics CONsorTium (ACCOuNT): Discovery and Translation	93.307	Northwestern University	60044818 SU		$131,144
UBXN4 regulation of antibody-drug conjugate delivery to lysosomes	93.859				$41,723
UC San Diego Clinical and Translational Research Institute: Mobile & Fixed Blood Donation Centers as Remote Clinical Trial Sites	93.350	University of California, San Diego	108033896 MP Invoice #S9002073		$72,935
UCSF-Stanford Pediatric Device Consortium	93.103	University of California, San Francisco	11168sc		$215,160
Ultra high throughput sequencer for sustaining and enhancing multi-scale genomic studies	93.351				($36,375)
Ultra high-throughput DNA synthesis via nano-optical conveyer belts	93.172				$283,934
Ultrabright Theranostic SERRS Nanoparticles for Gastrointestinal Endoscopy	93.394	Memorial Sloan-Kettering Cancer Center	BD523749		$263,181
Ultrasensitive Point-of-Care Diagnostics of Zika Infections Prior to Seroconversion	93.855	University of California, Santa Cruz	A19-0123-S001-P0675069		$78,174
Ultrasensitive Quantitation of Circulating Tumor DNA	93.396				$220,594
Ultrasound-Enhanced Drug Penetration for Treatment of Pancreatic Cancer	93.394	University Of Washington	UWSC10443 BPO38965		$162,138
Ultrasound-guided DNA delivery for regenerative medicine	93.286	Cedars-Sinai Medical Center	1458794	$55,094	$498,085
Ultrasound-Guided Robotic Needle Steering for Ablation of Liver Cancer	93.286				$65,924
Unbiased discovery of mechanisms regulating circRNA	93.859				$310,487
Uncovering compensatory mechanisms in family members with disease causing mutations of pulmonary hypertension	93.838				$61,004
Uncovering fundamentals of gene regulation by enhancers	93.859				$68,468
Understanding Control of Adipogenesis by the Dynamics of cAMP	93.847				$23,635
Understanding Force-dependent binding of alpha-catenin to actin	93.859				$261,810
Understanding Long-term Mortality Dynamics and Improving Old-age Mortality Forecasts	93.866				$84,938
Understanding RNA interactions through deep learning modeling of high-throughput biophysical measurements	93.859				$22,222
Understanding Severe Maternal Morbidity: Predictors, Trends, and Disparities	93.865				$50,759
Understanding the reactivity of the most complex multicopper oxidase ceruloplasmin: insight into the reaction intermediates, mechanism and the roles of the additional type 1 copper sites	93.859				$62,592
Understanding the Role of Mucosal Antigen Presenting Cells in Regulating Immune Responses	93.855				$524,903
Understanding the role of physician group organizational capabilities and integration in PCOR Implementation	93.226	Rand Corporation	9920180034	$10,537	$273,416
Understanding volitional state and advancing neuroprostheses through continuous neural recordings in humans	93.853	Massachusetts General Hospital	229356		$148,264
Unified Data Resource for 3DEM	93.859			$242,848	$553,953
Unifying Templates, Ontologies and Tools to Achieve Effective Annotation of Bioassay Protocols	93.879	University of Miami	SPC-000836		$116,344
Unique physiological properties of novel ganglion cell types in primate retina	93.867			$136,563	$611,354
Uniting Mass Spectrometry and Glycoscience to Investigate Cancer Biology	93.398				$70,700
Universal Roles of Force Generation and Transmission in Biological Systems	93.859	Purdue University	4102-83304		$83,725
University of Pittsburgh Clinical and Translational Science Institute - ACT Supplement	93.350	University of Pittsburgh	0055353 (130910-20) AWD00000243(132627-34)		$48,978
UNM Metal Exposure Toxicity Assessment on Tribal Lands in the Southwest (METALS) Superfund Research Program (SRP)	93.143	University of New Mexico	3RDD9 3RDD9-3		$28,131
Unmasking targetable dependencies in cancer with intrinsic or acquired resistance to anti-cancer therapies	93.398				$41,236
Unraveling mechanisms of tumor suppression in lung cancer	93.393				$27,821
Unraveling the pathogenesis of familial dilated cardiomyopathy towards precision medicine	93.837				$304,697
Use of Repetitive Transcranial Magnetic Stimulation to Augment Hypnotic Analgesia	93.213				$710,318
Using a Closed-Loop System Plus Behavioral Supports in Preschoolers with Diabetes	93.847			$269,167	$506,572
Using artificial intelligence to enable early identification and treatment of peripheral artery disease	93.837				$5,815
Using census data linkages to study long-term impacts on disparities in DNA methylation	93.307				$95,017
Using colloborative cross mice to monitor resilience to malaria	93.855				$11,397

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Using community ecology theory to predict the effects of agricultural expansion and intensification on humans and livestock: implications for sustainable agriculture	93.989	University of South Florida	1211-1065-00-A/1R01TW010286-01		$70,360
Using Exosomes to Preserve Viability and Function in Anthracycline Induced Cardiomyopathy Patient Specific Cardiomyocytes After Exposure to Doxorubicin	93.837				$69,354
Using Facebook to Address Smoking and Heavy Drinking in Young Adults	93.279	University of California, San Francisco	9401sc		$10,632
Using Functional Genomics to Inform Gene Environment Interactions for Colorectal Cancer	93.393	The Fred Hutchinson Cancer Research Center	956450		$20,797
Using game theory in primates to study the distributed neuronal and time-causal underpinnings of interactive social behavior	93.242	Massachusetts General Hospital	231064		$175,542
Using Human iDNs to Study Translational Control of Neuronal Function and Survival	93.853				($1,168)
Using NIATx Strategies to Implement Integrated Services in Routine Care	93.279			$168,000	$628,332
Using Protein Interaction Networks and Combinatorial Screens to target KRAS driven cancer	93.396			$146,381	$536,680
Using self-templating proteins to spatiotemporally organize biochemistry	93.859				$67,094
USRDS Special Study Center on Palliative and End-of-Life Care	93.847	University Of Washington	UWSC8324 PO#BPO 6779/BPO37090		$50,631
Utilizing Electronic Health Records to Measure and Improve Prostate Cancer Care	93.393				$756,608
Vaccine Induced Immunity in the Young and Aged	93.855	Emory University	A003088 A161786		$99,642
Vaccine Induced Immunity in the Young and Aged - TDP	93.RD	Emory University	Subaward A010797		$155,685
Vaccine-Induced Immunity in the Young and Aged	93.855	Emory University	A002987		$281,594
Validating Cardiac MRI Biomarkers and Genotype-Phenotype Correlations for DMD	93.837				$119,039
Validation of Biomarkers for Early Diagnosis and Risk Prediction of Pancreatic Neoplasms	93.394	University of Pittsburgh	0053387 (129061-1) 9014911 (131141-1) YR3		$4,250
Valine as a metabolic modulator of hematopoiesis	93.847				$482,334
Variation in Provider Breast Cancer Surveillance Strategies Following Initial Treatment: Contribution of Patient and Provider Factors, Association with Outcomes, and Stakeholder Insights	93.226	University of California, San Francisco	11141sc		$94,669
Varicella-Zoster Virus: T Cell/Skin Tropism & Immunity	93.855				$211,731
Vascularization in bone tissue engineering constructs	93.846				$96,176
Very-long Term Neurocognitive Outcomes in Breast Cancer Survivors; Overlap in the Mechanisms of Alzheimer Disease and Cancer Related Cognitive Impairment	93.393				$78,173
Vestibular and Visual Control of Eye Movement	93.173				$709,580
Viral GPCR recognition of chemokines and engineered ligands	93.855				$498,495
Viral use and mimicry of autophagy pathways and components	93.855				$407,705
Virally-induced tumorigenesis controlled by the microbiota	93.393	University of Chicago	FP068995		$10,419
VIRTUUS Children's Study - Validating Injury to the Renal Transplant Using Urinary Signatures	93.865	Children's Hospital of Philadelphia	3200880522; PO# 962849-RSUB		$109,262
Vitamin D to Prevent Type 2 Diabetes	93.847	Tufts Medical Center Inc	5015644-SERV		$82,433
Vitamin K status, cardiovascular disease, and arterial stiffness in chronic kidney disease	93.847	Tufts University	102508-00001 PO EP0182146		$20,861
Voltage-gated sodium channel regulation of neocortical development	93.853				$81,426
Volunteering as an Avenue for Improving Views of Aging	93.866				$56,850
Wake Forest Alzheimer's Disease Core Center	93.866	Wake Forest University	WFUHS441339 WFUHS101720-441340		$19,119
WASHINGTON UNIVERSITY K12 PROGRAM IN T4 IMPLEMENTATION RESEARCH	93.840	Washington University in St. Louis	WU-19-33		$188,852
Weight-Bearing Imaging of the Knee Using C-Arm CT	93.846			$38,631	$231,665
Western States Node of the National Drug Abuse Treatment Clinical Trials Network	93.279	University of California, San Francisco	10962sc		$170,166
What are we stimulating with transcranial ultrasound in Mice?	93.242				$323,523
WHISH 2 Prevent Heart Failure	93.RD	Care New England Health System	5001381-STEFANICK		$15,804
Whole blood gene expression to identify biomarkers of disease risk, progression and response to therapy in Type 1 diabetes	93.847				$425,822
Whole Genome Sequence Analysis of Ischemic Stroke in the Women's Health Initiative	93.837	The Fred Hutchinson Cancer Research Center	932729 977453		$26,465
Whole Transcriptome Studies of Patients with Transient Ischemic Attacks	93.853	University of California, Davis	201600371-01 (A16-0068-S001)		$34,985
Why do mammals have a flexible three-bone ossicular chain?	93.173			$539,602	$588,122
Wisconsin Alzheimer's Disease Research Center	93.866	University of Wisconsin-Madison	47		$613
Wnt4(+) Cell Fate Mapping and ENaC Activity in Furosemide-treated Mice	93.847	University of Pittsburgh	CNVA00060589 (131753-2)		$6,054
Women's Health Initiative - Regional Centers 2015-2020	93.RD			$151,911	$1,044,526
WormBase: a core data resource for C. elegans and other nematodes	93.172	California Institute of Technology	S405407		$274,558
Y6 Supplement to complete Stanford CAM Center for Chronic Back Pain	93.213				$17,159
Yeast as a Model for Understanding Gene Expression Adaptation	93.859				$542,201
Zimbabwe ICT Project (ZIP) and HIV Research Training	93.989			$15,444	$52,707
Department of Homeland Security					**$163,298**
Development of New Process for Growing SrI2 Crystals Having a Predetermined Shape	97.RD	CapeSym Inc	CS-19-B-00001		$82,502
Low-Cost Industrial Production of Halide Crystals	97.RD	CapeSym Inc	CS-15-B0040		($68,861)
Single Shot Computer Phase-Contrast Tomography	97.RD				$149,657
Department of Interior					**$634,018**
Assessment of Development and Utilization Technologies of Conventional & Unconventional Reservoirs	15.808				$139,223
Automated fault mapping of the North America-Pacific plate boundary using airborne laser swath mapping (ALSM) data	15.807				$24,588
Collaborative research on earthquakes and lithospheric seismic properities in Saudi Arabia	15.808				$88,375
Continued geologic mapping at Hawks Valley-Lone Mountain volcanic center, southeastern Oregon: Confirming that it contains the oldest caldera associated with Steens/Columbia River flood basalts and the Snake River Plain-Yellowstone trend?	15.810				$3,849
Ecosystem Service Values of Implementing the National Seed Strategy	15.231			$2,061	$12,760

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Forest management and socio-economic implications of prescribed burning by Yurok and Karuk Indians	15.232				$14,071
Investigating the seismic signature of earthquake nucleation with dynamic rupture simulations of micro earthquakes	15.807				$76,861
Law of the Sea - Limits of the Extended Continental Shelf	15.808				$7,004
Office of Redress Administration (ORA) Oral History Project	15.933				$15,568
Regionalized Crustal Attenuation for the Continental US Using Higher Order Ambient-Field Correlation	15.807				$69,251
Spatial correlation of ground motion characteristics for regional hazard and risk: regionalization and nonstationarity	15.807				($817)
Stanford-USGS Micro-Isotopic Analytical Center (SUMAC)	15.808				$119,258
The Use of NMR Logging Measurements to Estimate Hydraulic Conductivity in Glacial Aquifers	15.805	University of California Office of the President	SA17-3744-01	$6,581	$64,027
Department Of Justice					**$384,439**
A Confirmatory Test for Sperm in Sexual Assault Samples using a Microfluidic-Integrated Cell Phone Imaging System	16.560			$36,092	$180,169
Advanced statistical population genetics methods for forensic DNA identification.	16.RD				$161,418
Prospective Evaluation of California's Armed and Prohibited Persons System	16.560	University of California, Davis	201403462-04 2014-R2-CX-0012;A15-200-S001A4		$42,852
Department of State					**$2,318,262**
Afghanistan Legal Education	19.703			$273,512	$764,334
Citizen Trust and Evidence-Based Police Accountability and Professionalization in Mexico	19.703				$1,553,928
Department of Transportation					**$3,742,102**
Air Navigation Based on Global Navigation Satellite Systems	20.RD				$1,867,934
ASCENT Project 25: Continuation of Shock Tube Studies of the Kinetics of Jet Fuels	20.109				$150,322
Mitigate Threats through Space Envioronment Modeling/Prediction Including Micrometeroid and Orbital Debris (MMOD) Detection/Avoidance	20.109				$32,241
Task 331: Advanced 4D Special Use Airspace Research	20.109				$2,957
X-ray Differential Phase Contrast Scanner for Check Bag and Check Point Explosive Detection	20.RD				$1,688,648
Environmental Protection Agency					**$208,661**
ee360 Leadership and Training Collaborative: Building a Stronger and More Inclusive Movement (year 3)	66.950	North American Association for Environmental Education	805039934		$30,794
ee360 Leadership and Training Collaborative: Building a Stronger and More Inclusive Movement (year 3)	66.950	North American Association for Environmental Education	NT-83695801-1		$34,344
EPA STAR F1: Drinking Water Security in Times of Drought and Beyond: Improved Prediction, Management, and Decision-Making Tool for Water Distribution in Southern California	66.514				$13,807
Integrating Ecosystem Services Functions and Values into Land-Use Decision Making in the Narragansett Bay Watershed	66.129	Massachusetts Audubon Society	SE-00A00252 Sub 2		$3,601
SEARCH: Solutions for Energy, Air, Climate and Health	66.509	Yale University	GK000293 (CON-80000095)		$116,006
The Persistence of Environmental DNA in the Marine Environment	66.514				$10,109
Library of Congress					**$145,100**
Teaching with Primary Sources	42.002				$141,541
The ALSOS Mission Film Preservation Project Part II	42.U01	National Film Preservation Foundation	FED17-013		$3,559
National Aeronautics and Space Administration (NASA)					**$15,898,918**
"Simulating Energy Buildup and Eruptions in Solar Active Regions"	43.001	University of Michigan	SUBK00008007/PO# 3005157018		$31,327
500°C Capable, Weather¿Resistant Electronics Packaging for Extreme Environment Exploration	43.001	University of Arkansas	SA1704167		$96,968
A Definitive Test for Evolution in the Metallicity of the Intracluster Medium	43.001				$72,415
Advanced Microcalorimeter Arrays for Next Generation Missions	43.001				$76,604
Advanced Physical Models and Numerical Algorithms to Enable High-Fidelity Aerothermodynamic Simulations of Planetary Entry Vehicles on Emerging Distributed Heterogeneous Computing Architectures	43.012				$208,663
Advancing Focal Plane TRL for LiteBIRD and other Next Generation CMB Space Missions	43.001	University of California, Berkeley	9784		$264,766
Algorithmic foundations for real-time and dependable spacecraft motion planning	43.009				$87,995
AN EASIER AND MORE POWERFUL WAY OF ANALYZING FERMI/LAT DATA: FERMIPY	43.001				$5,452
An Innovative High Fidelity Multidisciplinary Computational Framework for Parachute Inflation Dynamics	43.012				$217,167
Angles-Only Navigation System for Nanosatellites	43.012				$30,928
Assistive Free-Flyers with Gecko-Inspired Adhesive Appendages for Automated Logistics in Space	43.012				$117,051
Autonomous Nanosatellite Swarming using Radio-Frequency and Optical Navigation (ANS) - Complement: Starling Formation-Flying Optical Experiment (StarFOX)	43.012				$168,622
Biosynthesis of 3-Methylhopanoids by Purple Non-Sulfur Anoxygenic Phototrophs	43.RD				$59,371
Blind Source Separation for Exoplanet Imaging	43.001	Cornell University	76341-10687		($10,433)
Building a complete sample of z>1 XXL galaxy clusters}	43.001	Smithsonian Astrophysical Observatory	GO8-19107A		$13,053
Building the SPT-HST Legacy: Imaging Massive Clusters to z=1.5	43.RD	Space Telescope Science Institute	HST-GO-15307.002-A		$57,790
Calibrated Multiangle Radar Measurements of Titan with Emphasis on Scattering and Structure - A Casini RADAR Team Member Proposal	43.RD	Jet Propulsion Laboratory	50989 Contract # 1416721		$12,510
Center for the Utilization of Biological Engineering in Space	43.012	University of California, Berkeley	00009564/PO#: BB00981189		$310,227
CO2 Conversion to Carbon Substrates for Biosynthesis on Space Missions	43.003				($3,171)
Collaborative Manipulation for Space Exploration and Construction	43.012				$49,174
Collaborative Research to Evaluate Add-Air Mixing in Modified Arc-Heaters for Ames Arc-Jets	43.009				$82,242
Cosmic Rays, Magnetic Fields and Diffuse Emissions: Combining Observations from Radio to Gamma Rays	43.001				$79,285
Data Upgrade: HMI Data Corrected for Stray Light	43.001				$26,508
Developing a Material Response Model of Biopolymer-Stabilized Regolith to Predict Micrometeorite Damage of ISRU Habitat Systems	43.012				$51,203

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Development of a Fidelity-Adaptive LES Combustion Model for Predicting Fuel-Sensitivities on Combustion Stabilization and Ignition	43.002				$129,023
Development of integrated readout electronics for next generation X-ray CCDs	43.001				$82,182
Development of mechanically versatile bioreactor system as a cellular microgravity countermeasure for regenerative medicine applications	43.009				$12,747
Direct hydrogenation of CO2 to ethylene	43.012				$69,553
DISENTANGLING DARK MATTER GAMMA-RAY SIGNALS FROM ASTROPHYSICAL FOREGROUNDS: COMBINING SEARCHES IN A PUBLIC FRAMEWORK	43.001				$3,156
Does the bacterial production of the eukaryotic biomarker tetrahymanol impact our interpretation of gammacerane biosignatures in the geological record?	43.001				$42,407
Dynamic non-reciprocal structures: numerical optimization, and thermodynamics	43.RD	Lockheed Martin	PO 6574024191		$149,561
Electric-Current Neutralization in Solar Active Regions and its Relation to Magnetic Shear and Eruptive Activity	43.001			$20,387	$57,385
Enabling Precision Cosmology with Optically Selected Galaxy Clusters	43.001	Smithsonian Astrophysical Observatory	GO8-19101A		$124,139
Engineering Gecko-Inspired Adhesives for Robotic Mobility and Manipulation in Microgravity	43.012				$50,188
Enhancing Galaxy Cluster Cosmology	43.001				$992
Evolution of a Multi-Functional Adhesion Module Necessary for Complex Multicellularity	43.001	University of Denver	SC37607-02/P0153800		$115,695
Exoplanets Unveiled: Formation, Evolution and Prospects for Life	43.001	University of California, Berkeley	NNX15AD95G00008748 /BB00562605		$32,179
Experiments in body plans: evolutionary origins of the echinoderm radial body plan	43.001				$162
Feasibility Study of Using Matrix-Stabilized Combustion Technologies to Enable Ultra-low Emission Combustion in Aviation Gas Turbines (Phase II)	43.002			$44,786	$92,260
FOLLOW UP GRAVITATIONAL WAVE CANDIDATES WITH THE FERMI LAT DURING O3	43.001				$4,851
Following the Ultra-Fast Winds in the Stellar-Mass Black Hole, IGR 17091-3624	43.001	Smithsonian Astrophysical Observatory	GO6-17036X		$16,654
Frequency-Dependent Helioseismic Analysis on Solar Meridional Flow, Center-to-Limb Effect, and Sunspots	43.001				$2,309
Frontiers of cluster cosmology	43.001	Smithsonian Astrophysical Observatory	PF5-160138		$23,367
Functional analysis of abundant candidate microbial phyla in geothermal springs	43.001	University of Nevada, Las Vegas	GR07011		$37,253
Gas Diffusion Electrochemical Cells for CO2 to Acetate Conversion	43.003				$159,345
Geant4 expert-level support for NASA/JPL	43.001	Jet Propulsion Laboratory	1582145		($178)
Helioseismic and Magnetoacoustic Waves in and above Sunspots: Origin, Up-Channeling, and Reflection	43.001			$22,581	$111,422
Hemispheric Asymmetries of Magnetic Field	43.001				$7,656
HERO Twin Astronaut Study Consortium (TASC): Immunome Changes in Space	43.003				$8,404
High Resolution Vegetation Water Content, Fire Risk, and Tree Mortality Estimation using Synthetic Aperture Radar	43.001				$45,000
HST Grism observations of the highest-z massive galaxy cluster	43.RD	Space Telescope Science Institute	HST-GO-15267.002-A		$53,558
Human Exploration Research Opportunities (HERO)	43.003	Weill Medical College of Cornell University - New York	PO 4100436121/1606956		$190
Hybrid Modeling of Jet Fuel Combustion Chemistry	43.002				$24,873
IGS 2019: 50 years of Radioglaciology	43.001				$17,406
Impacts of Severity and Legacy of Droughts on Carbon exchange of the Amazon tropical forests	43.001	Jet Propulsion Laboratory	CREI 1571092		$30,229
Improved algorithms for measuring phytoplankton biomass and productivity in the changing Arctic Ocean	43.001				$45,000
Improving estimates of terrestrial gross primary productivity with remote sensing of solar-induced chlorophyll fluorescence	43.001				$24,000
Improving Linkages Between Earth Observations and Ecosystem Service Models with Essential Biodiversity Variables	43.001				$163,788
Improving Magnetic Field Boundary Conditions for Solar Wind Forecast Models	43.001	University of Colorado, Boulder	1557399 PO# 1001116383		$55,968
Inferring the mass function and galaxy content of low mass subhalos with HST observations of ALMA strong lensing systems	43.RD	Space Telescope Science Institute	HST-AR-14567.002-A		$20,184
Integration of InSAR with Airborne Geophysical Data for the Development of Groundwater Models	43.001				$27,211
Intra-Binary Shock Emission in the Black Widow Population	43.001				$103,488
Investigating the Momentum Processes and Magnetic Forces Associated with Solar Flares and Coronal Mass Ejections	43.001	University of California, Berkeley	SUB#00009511/ #NNX17AI28G		$5,239
Investigations of Climate and Environmental Change on Arctic Pacific Shelves (ICECAPS)	43.001				$14,973
IRIS Small Explorer Mission	43.RD	Lockheed Martin	Sub 8100003073 Line #6		$177,752
Joint inversion of seismicity and geodetic observations for imaging volcanic intrusions	43.001				$27,629
Joint radar and model investigations of Greenland basal water conditions	43.001			$92,199	$296,551
Kepler-K2 AGN Light Curves: A Unique Tool for Accretion Physics and the Detection of Binary AGN	43.001	Smithsonian Astrophysical Observatory	PF7-180168		$95,412
Mars Express Radio Science Experiment, Stanford University Element	43.RD	Jet Propulsion Laboratory	1471562		$213,892
mDOT: Miniature Distributed Occulter Telescope for characterizing extrasolar dust disks	43.001				$99,786
Mechanisms underlying charged particle-induced disruption of CNS function	43.003	University of California, Irvine	2015-3277		$195,131
METEOROID IMPACT DETECTION FOR EXPLORATION OF ASTEROIDS (MIDEA)	43.001				$71,351
Mini Radio Frequency Instrument for Lunar Orbiter	43.RD	Johns Hopkins University Applied Physics Laboratory	138046 CLIN 1 PROJECT LJH06		$49,392
Modeling of Cosmic-Ray Propagation and Galactic Diffuse Gamma-Ray Emission in Support of Current and Future NASA Missions, Phase 3	43.001				$452,589
Modeling the Universe - Interfacing Numerical Simulations, Theory, Statistical Methods, and Observations	43.RD	Jet Propulsion Laboratory	CREI 1574309		$1,574
NASA Food Security and Agriculture Consortium (FSAC)	43.001	University of Maryland	54308-Z6059203		$194,528

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NASA SPACE TECHNOLOGY RESEARCH FELLOWSHIPS (NSTRF) - Fall 2018 Textile-Composite Capacitive Sensors for Proprioceptive Origami-based Rovers	43.012				$46,293
National Marine Sanctuaries as Sentinel Sites for a Demonstration Marine Diodiversity Observation Network (MBON)	43.001	University of South Florida	2500-1616-00-C / NNX14AP62A		$152,815
Networking and Navigation for Spacecraft Swarms	43.009				$58,030
Next Generation Microwave Multiplexers	43.001				$2,989
NUSTAR TOO OBSERVATIONS OF LUMINOUS BLAZARS	43.001				$1,661
Oceans Across Space and Time	43.001	Georgia Institute of Technology	RK617-G6		$19,001
Onboard Risk-Aware Real-Time Motion Planning Algorithms for Spacecraft Maneuvering	43.012				$78,058
Optical Counterparts for LAT Pulsars and UNIDentified Sources	43.001				$3,037
Optical Counterparts for Top LAT MSP Candidates	43.001				$374
Optimal Impulsive Control of Spacecraft Relative Motion	43.012				$54,829
OPTIMIZING THE SEARCH FOR ELECTROMAGNETIC COUNTERPARTS TO GRAVITATIONAL-WAVE CANDIDATES WITH THE FERMI-LAT	43.001				$33,429
Passively Compensated Low¿Power Chip¿Scale Clocks for Wireless Communication in Harsh Environments	43.001				$47,117
Perception-Aware Spacecraft Motion Planning	43.012				$77,008
Persistent Scatterer InSAR: Maximizing Coverage and Enabling Application to Groundwater Management	43.001				$102,140
Pinning Down the Origin of an Extreme Radio Phoenix	43.001	Smithsonian Astrophysical Observatory	GO6-17118X		$9,705
Precision GNSS-Based Navigation and Timekeeping for Miniaturized Distributed Space Systems	43.012				$3,910
Predicting Fire Risk in Tropical Peatlands Using SMAP Soil Moisture	43.001				$45,000
Probing the most distant high-mass galaxy clusters from SPT with HST weak lensing observations	43.RD	Space Telescope Science Institute	HST-GO-14677.003-A		$14,330
Providing Enabling & Enhancing Technologies for a Demonstration Model of the Athena X-IFU	43.001				$362,427
Providing enabling and enhancing technologies for a demonstration model of the Athena X-IFU	43.001				($170)
PSR J2124-3358: A Unique, Isolated MSP/PWN/Bowshock	43.001	Smithsonian Astrophysical Observatory	GO6-17059X		$36,503
PSR J2124-3358: A Unique, Isolated MSP/PWN/Bowshock	43.RD	Space Telescope Science Institute	HST-GO-14364.001-A		$263
Quantum-Limited Amplifiers for Detector Arrays on NASA's Inflation Probe	43.009				$18,769
Radiation Hard and High Temperature Tolerant Thermal Imagers	43.001	Jet Propulsion Laboratory	CREI 1631670		$23,335
Radio Science Advisor to Planetary Data System	43.001	University of California, Los Angeles	2090GTB148		$100,245
Real World, Real Science: Using NASA Data to Explore Weather and Climate	43.001	Gulf of Maine Research Institute	30-NASARS-15-Stanford		$143,860
REASON (Radar for Europa Assessment and Sounding: Ocean to Near Surface) REASON	43.RD	University of Texas at Austin	UTA16-001083		$10,077
Reliving The Past: Experimental Evolution of Major Transitions In The History of Life	43.001	Georgia Institute of Technology	RH809-G4		$168,869
Risk-Sensitive Learning and Decision Making for Autonomous Space Robots	43.RD				$65,656
Robust and Efficient GNC Algorithms for Autonomous Formation Flying using Electric Propulsion	43.012				$60,335
Robust Prediction of the Interplanetary Magnetic Field using Statistical and Physics-Based Model Approaches	43.001	Predictive Science Inc.	NASA NNX15AF39G -- NAPR04		$60,204
Robust Verification Tools for Precision Entry Guidance	43.012				$96,700
S3.03-8502 - Advanced High Frequency High Voltage Power Converter	43.RD	QorTek, Inc.	80NSSC18CP2074SUB 01/135980		$29,718
Scalable Hierarchical CFD Solvers for Future Exascale Architectures	43.002				$149,482
Science Study for Space-based Optical Atomic Clocks and Optical Time Transfer	43.001	Jet Propulsion Laboratory	Sub No. 1583357		($2,523)
Search for short gamma-ray bursts from core-collapse supernovae induced by axionlike particles	43.001				$14,495
Seeing to the Event Horizons of Supermassive Black Holes	43.001	Smithsonian Astrophysical Observatory	PF6-170160		$100,241
Shapeshifters from Science Fiction to Science Fact: Globetrotting from Titan's Rugged Cliffs to its Deep Seafloors	43.001	Jet Propulsion Laboratory	CREI 1607628		$27,370
Shock structure, the electron-ion equilibration timescale and the disintegrating cool core in A2146	43.001	Smithsonian Astrophysical Observatory	GO8-19110E		$28,787
SIMPLIFIED PARALLELIZED ISCE (SPISCE)	43.001	Jet Propulsion Laboratory	CREI 1586176		$141,744
Slow Slip Events in Cascadia: Observation and Hazard Analysis Derived from InSAR, With GPS and Seismic Data Constraints	43.001				$95,482
Solving the missing satellite problem: detecting dark matter subhalos with gravitational lensing	43.RD	Space Telescope Science Institute	HST-HF2-51358.001-A		$5,309
Space Environmental Electrical Power Subsystem (SEEPS)	43.012				$60,000
Spaceflight Effects on Bacterial Antibiotic Resistance and its Genetic Basis "Antimicrobialsat"	43.007				$2,462
Structure and Temporal Evolution of Solar Deep Meridional Circulation	43.001				$31,582
Sweet are the Uses of Adversity: Genomic Responses to Stress and its Implication for Adaptation and the Origin of New Species	43.001	Georgia Institute of Technology	RH877-G1		$60,395
Testing Feedback Models of Galaxy Formation Using COS Halos Survey Data	43.RD	Space Telescope Science Institute	HST-AR-13920.002-A		$4,210
The Airborne InSAR and PolSAR Permafrost Dynamics Observatory	43.001	University of Colorado, Boulder	1554878,PO 1000792321		$129,292
The Community Global Evolving Model	43.001				$51,628
The evolution of early-type galaxies: An X-ray perspective	43.001	Smithsonian Astrophysical Observatory	PF5-160134		($14,961)
The Fermi Large Area Space Telescope - Phase E 6-year Extension	43.RD			$375,411	$1,688,428
The Gemini Planet Imager Exoplanet Survey: Completion and Analysis	43.001			$29,984	$186,131
The Highest-energy Electromagnetic Counterparts to Neutron Star Mergers	43.RD	Space Telescope Science Institute	HST-HF2-51407.001-A		$106,230
THE LAT TRANSIENT FACTORY. UNVEILING THE NATURE OF LAT GRBS AND SHORT-DURATION TRANSIENTS	43.001				$19,758
THE LAT TRANSIENT FACTORY: PROVIDING 10 YEARS AND MORE OF LAT GRBS AND SHORT-DURATION TRANSIENTS	43.001				$5,452
The Solar Dynamics Observatory (SDO) Helioseismic and Magnetic Imager Investigation- Second Extended Mission	43.RD			$47,958	$3,825,983

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Towards understanding where and when dikes erupt (Student: Elias Heimisson)	43.001				$45,819
Triggering and Evolution of AGN in the Cluster Environment	43.001				$87,681
Tropical controls on the atmospheric growth rate and implications for carbon-climate feedbacks	43.001	Jet Propulsion Laboratory	CREI 1585339		$70,693
Uncovering the True Nature of Warm-Absorbing Winds: The Power of the Fe XXII Doublet	43.001	Smithsonian Astrophysical Observatory	GO5-16105X		$12,302
Understanding Long-lived, Ubiquitous AGN Feedback in Early-type Galaxies	43.001				$40,480
Understanding the Role of Helicity Flux in Solar Eruptions from Active Regions	43.001				$41,477
US Contribution to the Athena Wide Field Imager	43.001	The Pennsylvania State University	5584-LSJU-NASA-B07G	$226,982	$380,950
Using earth observations and ecosystem modeling to improve the sustainability of agribusiness and extractive industries in working landscapes	43.001				$220,055
Using Model-Data Fusion to Determine Plant Hydraulic Traits and Transpiration	43.001				$78,971
Validation of wall models for LES with application to the NASA Common Research Model	43.002				$238,181
WFIRST Extragalactic Potential Observations (EXPO) Science Investigation Team	43.RD	University of California, Santa Cruz	A16-0381-S003-P0590505		$6,584
Witnessing the Formation of a Radio Halo	43.001	Smithsonian Astrophysical Observatory	GO8-19115A		$61,869
Zooming Out: How Regular are Cluster Atmospheres at and Beyond the Virial Radius	43.001	California Institute of Technology	S401907		$25,239
National Archives & Records Administration					**$185,507**
Martin Luther King, Jr., Papers Project	89.003				$185,507
National Endowment for the Arts and Humanities					**$453,906**
Email: Process, Appraise, Discover, Deliver - ePADD Phase 2 Proposal #LG-70-15-0242	45.312				$125,517
Martin Luther King, Jr., Papers Project	45.161				$113,479
Stanford University Archaeology Collections Inventory Project	45.301				$96,461
The Global Medieval Sourcebook	45.169				$22,091
The Marzamemi Church Wreck	45.161				$96,358
National Science Foundation (NSF)					**$80,661,071**
"Big-Data" Asymptotics: Theory and Large-Scale Experiments	47.049				($1,290)
A Belonging Intervention to Improve STEM Outcomes for Underrepresented Students: A Randomized-Controlled Trial at 22 Colleges	47.076	Indiana University	BL-4831221-SU / PO 2113492 GF		$60,999
A New Mechanism for Mode Water Formation at a Thermohaline Ocean Front	47.050				$5,021
Advanced photoelectrode architectures of tantalum (oxy)nitrides for photo-electrochemical (PEC) water splitting	47.049	California Institute of Technology	68D-1094586		$8,490
AF: Medium: Collaborative Research: Beyond Sparsity: Refined measures of complexity for linear algebra	47.070				$129,583
AF: Medium: Collaborative Research: Circuit Lower Bounds via Projections	47.070				$55,663
AF: Medium: Collaborative Research: Exploiting Opportunities in Pseudorandomness	47.070				$146,635
AF: MEDIUM: Collaborative Research: Foundations of Adaptive Data Analysis	47.070				$43,928
AF: Small: New Directions in Algorithmic Game Theory	47.070	Columbia University	1(GG014588) / SAPO: G13765		$4,458
AF: Small: New Directions in Algorithmic Game Theory	47.070				$86,791
AF: Small: New Perspectives on Mathematical Programming Relaxations	47.070				$904
AF: Small: Robust and Secure Learning	47.070				$92,236
AF:Medium:Collaborative Research:The Quest for Statistically Optimal Algorithms	47.070				$41,533
AF:Medium:Collaborative: Algorithmic Foundations for Trajectory Collection	47.070				$45,259
AF:SMALL:Geometry of Polynomials and Algorithm Design	47.070				$117,975
AitF: Collaborative Research: Efficient High-Dimensional Integration using Error-Correcting Codes	47.070				$77,799
AiTF:Collaborative Research: Fair and Efficient Societal Decision Making via Collaborative Convex Optimization	47.070				$265,696
An Approach to Robust Performance Analysis using Optimal Transport	47.049				$49,779
An experimental facility to test the impacts of multiple physical stressors on physiology, ecology and genomics of marine species	47.074				$41,898
An Interdisciplinary Approach to Reducing Disparities in Social Capital	47.075				$76
ANES WEB: American National Election Studies 2018-2021	47.075				$44,700
Approaches to Improve Synthesis Design: Mechanistic and Synthetic Studies on New Annelation Methods	47.049				$218,916
Asylum Seeker and Refugee Integration in Europe	47.075			$26,377	$130,206
Auction Market Design	47.075				$34,013
Automatically Detecting Security Events and Trends in Network Telescope Data	47.070	University of Michigan	SUBK00010794 / 3005341607		$41,201
Bargaining Through the Lens of Big Data	47.075	National Bureau of Economic Research	36293.00.00.00-7700		$16,920
Baseline Survey of Asylum Seekers in Germany	47.075				$109,977
BIGDATA: Collaborative Research: F: From Data Geometries to Information Networks	47.070				$117,886
BIGDATA: F: BCC: Data driven optimization of classroom learning activities	47.076	University Of Washington	UWSC10355 / BPO 29468		$233,243
BIGDATA: F: Computationally efficient algorithms for large scale crossed random effects models	47.070				$101,229
BIGDATA: F: DKA: Collaborative Research: Dealing Efficiently with Big Social Network Data	47.070				($3,388)
BIGDATA: F: Reliable Inference with Big Data: Reproducibility, Data Sharing, Heterogeneity	47.070				$305,785
BIGDATA:IA: Hype Cycles of Scientific Innovation	47.070				$449,694
Bio-Inspired Ankle-Knee Coupling to Enhance Walking for Individuals with Transibial Amputation	47.041	Vanderbilt University	UNIV59842		$3,107
Biology with X-ray Lasers	47.074	State University of New York at Buffalo	R1092330		$199,243
BIOROBOOST travel support for US-based researchers to workshops to develop standards in synthetic biology	47.074				$3,564
Brain Comp Infra: EAGER: A knowledge infrastructure for cognitive neuroscience	47.070				$88,003

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Building a Framework for Developing and Evaluating Contextualized items in Science Assessment (DECISA)	47.076			$99,310	$321,334
California Alliance for Graduate Education and the Professoriate-II	47.076	University of California, Berkeley	9415		$120,964
Career Life Balance in Effects of temperature on vector-borne disease transmission: Integrating theory with empirical data	47.074			$446,593	$573,536
CAREER: A Hydrologic Thermostat for the Global Carbon Cycle?	47.050				$34,592
CAREER: A Runtime for Fast Data Analysis on Modern Hardware	47.070				$54,667
CAREER: Algorithms for understanding data	47.070				($8)
CAREER: Building empathy through social psychological interventions	47.075				$91,663
CAREER: Chemical Synthesis and Biophysical Study of Noncanonical Membrane Lipids	47.049				$2,881
CAREER: Controlling Ecologically Destructive Processes with a Network of Intelligent Robotic Agents	47.070				$107,922
CAREER: Controlling Polymer Degradation, Microstructures, and Sequences via Living Alternating Polymerization of Cyclopropenes and Low-Strain Cyclic Olefins	47.049				$206,129
CAREER: Crossing over into the geochemical milieu: Using the molecular genomic record to inform the geologic biomarker record	47.050				$77,546
CAREER: Cross-Instrument Synthesis of Antarctic Radar Sounding Observations	47.050				$91,030
CAREER: Data Analytics for Distribution Systems Management and Operations	47.041				$62,185
CAREER: Dielectric screening in structured polymer electrolytes	47.049				$53,868
CAREER: Efficient Learning of personalized Strategies	47.070				$26,980
CAREER: Enabling expert crowdsourcing via coordination, targeted contribution and education	47.070				$60,407
CAREER: Enabling the Design of Future Robotic Transportation Systems via Spatial Queueing Network Theory	47.041				$58,418
CAREER: Extremal Combinatorics: Methods, Problems and Challenges	47.049				$22,883
CAREER: Form and Function of Bacterial Amyloid Fibers	47.074				$255,263
CAREER: From Ecology to Neurobiology: spatial cognition in rainforest frogs	47.074				$59,901
CAREER: Healthcare Decision Models with High Dimensional Data	47.041				$78,034
CAREER: How Birds Lift Weight with Flapping Wings	47.074				$149,504
CAREER: Interrogating and Exploiting the Hydrodynamics of Concentrated Emulsions for Droplet Microfluidics.	47.041				$177,500
CAREER: Investigating the structure and dynamics of proton defects in heterogeneous environments with accelerated quantum simulations	47.049				$196,151
CAREER: Investigation of a prion-based metabolic switch driven by cross-kingdom chemical communication	47.074				$83,206
CAREER: Midfield Wireless Powering of Subwavelength Probes for Neuroscience and Cardiology Applications	47.041				($4,802)
CAREER: Modeling and Inference for Large Scale Spatio-Temporal Data	47.070				$9,839
CAREER: New Fundamentals in Coding Theory	47.070				$43,311
CAREER: Novel designs for kidney exchange and other markets, in the intersection of Operations Research, Economics and Computer Science	47.041				$13,242
CAREER: Optimizing Computational Range and Velocity Imaging	47.070				$59,188
CAREER: Print and Fold Optical Instruments	47.041				$131,130
CAREER: Probabilistic Design and Engineering of Sustainable Infrastructure Using Multi-Physics Modeling Approaches	47.041				$139,950
CAREER: Regulation of stem cell migration by extracellular matrix plasticity	47.041				$22,741
CAREER: Revealing a Reduced-Order Model for Chaotic Electroconvection and its Applications	47.041				$158,769
CAREER: Rheology, Stability, and Sudden Collapse of Colloidal Gels: A Micromechanical Study	47.041				$804
CAREER: Small-molecule capture and ion transport in well-defined hybrid materials	47.049				$11,899
CAREER: Stretchability by Design - Understanding Mechanical Phenomena in Microarchitectured Soft Material Systems	47.041				$79,048
CAREER: Subduction Zone Hazards: Megathrust Rupture Dynamics and Tsunamis	47.050				($415)
CAREER: The optimal use of data	47.070				$111,569
CAREER: Theory of Fast Graph Optimization	47.070				$57,782
CAREER: Two-Dimensional Phase Change Materials	47.049				$127,210
CAREER: Ultrasonically-Powered Smart Medical Implants for Monitoring and Modulating Local Physiology	47.041				$30,243
CAREER: Understanding Redox Activity of Electroceramics using Atomically-Flat Surfaces	47.049				$43,899
CAREER: Unifying representation stability via FI-categories	47.049				$24,526
CAREER: Visualizing Earth's Core-Mantle Interactions using Nanoscale X-ray Tomography	47.050				$7,058
CAREER: When do mycorrhizal fungi influence plant community dynamics?	47.074				$1,928
CAREER:Interactive Training of Semantic Parsers via Paraphrasing	47.070				$116,421
CCF-BSF: AF: CIF: Small: Low Complexity Error Correction	47.070				$122,760
CCI Center in Selective C-H Functionalization	47.049	Emory University	T849613 A022569		$291,922
CCI Phase I: Center for First Principles Design of Quantum Processes	47.049			$119,781	$393,089
CCSS:Emulating Mixed-Signal VLSI Systems	47.041				$48,679
CEDAR: Investigation of Atmospheric Neutral Density Dynamics Through Meteor Observations	47.050				$33,504
Center for Cellular Construction	47.074	University of California, San Francisco	9907sc 9917sc		$167,259
Center for Dark Energy Biosphere Investigations (C-DEBI)	47.083	University of Southern California	66468074/PO# 10392717		$363,112
Center for Energy Efficient Electronics Science (E3S)	47.041	University of California, Berkeley	007445/BB00099670/EE CS-0939514		$84,119
Center for Environmental Implications of Nanotechnology	47.074	Duke University	14-NSF-1048		$5,379
Center for Turbulence Research Summer Program	47.041				$1,903
Chiral Quantum Networks	47.049	University of California, Santa Barbara	KK1924		$37,767
CHS: Medium: Collaborative Research: Augmented Reality Agents with Pervasive Awareness, Appearance, and Abilities	47.070				$70,615
CHS: SMALL: Blending the Virtual & the Physical: Understanding and Designing Crowd-Based Open Innovation Systems for Physical Products	47.070				$132,880

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CHS: Small: Collaborative Research: The Presentation of Self in Networked Life	47.070				$107,765
CHS: Small: Collaborative Research: Wearable Fingertip Haptic Devices for Virtual and Augmented Reality: Design, Control, and Predictive Tracking	47.070				$216,524
CHS: Small: Collaborative: Teleoperation with passive, transparent force feedback for MR-guided interventions	47.070				$79,551
CHS:Small:Collaborative Research: Understanding and Improving Implicit Coordination in Peer Production Networks	47.070				$45,139
CIF: Medium: Collaborative Research: On Demand Physical Layer Cooperation	47.070				$20,879
CIF: Small: Collaborative Research: Generative Adversarial Networks: From Art to Science	47.070				$2,867
CIF: Small: Collaborative Research: Generative Adversarial Privacy: A Data-driven Approach to Guaranteeing Privacy and Utility	47.070				$8,979
CIF: Small: Energy-neutral Massively Large Wireless Networks	47.070				$143,095
CIF:Medium: Collaborative Research: Learning in High Dimensions: From Theory to Data and Back	47.070				$101,139
CIF:Medium:Collaborative Research: Geometric Network Information Theory	47.070				$109,418
CIF:Small:Information-theoretic and Computational Thresholds in Statistical Learning	47.070				$111,226
CIF21 DIBBs: Building a Scalable Infrastructure for Data-Driven Discovery and Innovation in Education	47.070	Carnegie Mellon University	1122183-333107;ACI-1443068		$68,767
CM: Collaborative Research: Simulation-based software tools for automated knitting	47.041				$62,893
CNH-L The coupled climate and institutional dynamics of shortlived local pollutants and long-lived global greenhouse gases	47.050	University of California, San Diego	92908921 (PO# S9001719)		$232,735
CNS Core: Large: Autonomy and Privacy with Open Federated Virtual Assistants	47.070				$287,800
Coastal SEES: Coastal fog-mediated interactions between climate change, upwelling, and coast redwood resilience: Projecting vulnerabilities and the human response	47.050	University of California, Santa Cruz	A17-0931-S003-P0685727		$204,598
Co-Director of the Southern California Earthquake Center (SCEC)	47.RD	University of Southern California	1008681-1-HAJZF		($52,130)
Co-funding for: Quantifying the Contribution of Disinfection Byproducts to the Toxicity of Wastewaters Purified for Potable Reuse: Which Byproduct Classes Matter?	47.041	Water Research Foundation (WaterRF)	Project 04737		$40,552
Cohomological periods and high rank latices	47.049				$23,227
Colaborative Research: Identifying and harnessing local refuges from oceanographic extremes for coastal marine species and fisheries	47.050				$333,461
Collaborative proposal: Developing a battery of methods for the study of the trafficking mechanisms and transformations of silver and gold nanomaterials in human cells	47.041				$4,453
Collaborative Research: "Seeing" Neighborhood Mechanisms of Health Inequality with Computer Vision	47.075				$41,206
Collaborative Research: A New Computer Science Faculty Teaching Workshop	47.076				$12,076
Collaborative Research: A Partnership to Adapt, Implement and Study a Practice-based Professional Learning Model and Build District Capacity to Meet the Challenges of NGSS	47.RD				$288,957
Collaborative Research: ABI Innovation: Computational Methods for Soft Selective Sweeps	47.074				$213,712
Collaborative Research: American National Election Studies (ANES) 2014-2017	47.075				$471,262
Collaborative Research: Analysis and Modeling of Nonlinear Wave-Particle Interactions from the Siple Transmitter Experiment	47.050				$20,402
Collaborative Research: Applying Automated Analysis to a Learning Progression for Argumentation	47.076				$116,336
Collaborative Research: Automatic video interpretation and description	47.049				$70,675
Collaborative Research: Axion Resonant InterAction DetectioN Experiment (ARIADNE) - a continuation proposal	47.049				$104,964
Collaborative Research: Biogeochemical significance of the abundant, uncultivated symbiotic cyanobacteria UCYN-A	47.050				$4,120
Collaborative Research: Cobalamin and Iron Co-Limitation Of Phytoplankton Species (CICLOPS) in Terra Nova Bay	47.050				$66,543
Collaborative Research: CompCog: Broad-coverage probabilistic models of communication in context	47.075				$29,464
Collaborative Research: Compressive Robotic Sensing Systems: Gaining Efficiency through Sparsity in Dynamic Sensing Environments	47.041				$138,670
Collaborative Research: Density-enhanced data assimilation for hyperbolic balance laws	47.049				$152,222
Collaborative Research: Designing thermophotonic materials for passive radiative cooling	47.041				$16,400
Collaborative Research: Differential contributions of archaeal ammonia oxidizer ecotypes in relation to their changing environment	47.050				$8,863
Collaborative Research: EAGER: The early evolution of the Brachiopoda- an integrated phylogenomic and paleontological approach	47.074				$51,090
Collaborative Research: Effect of Helicity on the Development of Free-Shear Turbulence at High Reynolds Number	47.041				$94,234
Collaborative Research: Elucidating environmental controls of productivity hot-spots around Antarctica	47.050				$193,450
Collaborative Research: Engineering Fully Biobased Foams for the Building Industry	47.041				$113,048
Collaborative Research: Fluid Mechanical Basis of Universal Natural Propulsor Bending Patterns	47.041				$132
Collaborative Research: Foraging behavior and ecological role of the least studied Antarctic krill predator, the Antarctic minke whale (Balaenoptera bonaerensis)	47.050				$94,636
Collaborative Research: Framework: Software: CINES: A Scalable Cyberinfrastructure for Sustained Innovation in Network Engineering and Science	47.070				$91,531
Collaborative Research: Helium-isotope systematics along seismic profiles in Tibet to study geometry of Indian and Tibetan lithosphere beneath the Lhasa and Qiangtang terranes	47.050				$83,450
COLLABORATIVE RESEARCH: HIGH-PERFORMANCE COMPUTATIONAL STANDARDS FOR REDISTRICTING	47.075				$23,241

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Collaborative Research: Hydrologic Disturbance in Tropical Peatlands: Linking Drainage, Soil Moisture, Flammability, and Carbon Fluxes	47.RD				$12,543
Collaborative Research: IDBR: Type A: Diver-Operated Imaging Platform with Complementary Systems for Quantifying Aquatic Organism Interactions	47.074				$70,967
Collaborative Research: Imaging the Beginning of Time from the South Pole: The next Stage of the BICEP Program	47.050				$107,932
Collaborative Research: Improved observation and parameterization of bottom boundary layer turbulence and particle properties for sediment fate and transport modeling	47.050			$240,513	$445,569
Collaborative Research: LSC Center for Coatings Research	47.049				$65,017
Collaborative Research: Management and implementation of the US GEOTRACES Pacific Meridional Transect	47.050			$68,082	$145,609
Collaborative Research: Mapping High-Performance Design Team "Genome"	47.041				($1,024)
Collaborative Research: Measurement of Particle Aggregation in Laboratory-scale Flows for Improved Models of Volcanic Ash Fallout and Entrainment	47.050				$88,323
Collaborative Research: Mechanisms and Controls of Nitrous Oxide Production in the Eastern Tropical North Pacific Ocean	47.050				$134,026
Collaborative Research: MESOBOT: A ROBOT FOR INVESTIGATING THE OCEAN INTERIOR	47.050				$139,707
Collaborative Research: Mining Seismic Wavefields	47.050				$60,308
Collaborative Research: Modeling the Invention, Dissemination, and Translation of Scientific Concepts	47.075				$88,624
Collaborative Research: Multiplexing: Theories and Tests of Interactions Between Types of Relationships	47.075				$31,052
COLLABORATIVE RESEARCH: NANOPATTERNING AND TEMPORAL CONTROL OF PHASE-CHANGE MATERIALS FOR HIGH-BANDWIDTH DEVICES	47.041				$448
Collaborative Research: New Algorithms for Computing Equilibria of Stochastic Games	47.075	Princeton University	SUB0000134		($70,212)
Collaborative Research: NGSS Science and Engineering Practices and English Language Learners	47.076				$536,327
Collaborative Research: Nonlinear Coupling and Relaxation Mechanisms in Micro-Mechanics	47.041				$48,413
Collaborative Research: NRI-Small: Rapid Exploration of Ankle-Based Locomotion Assistance Strategies Using a Novel Co-Robot Testbed	47.041				$48,770
Collaborative Research: NSF INCLUDES Alliance: STEM Core Expansion	47.076	Saddleback College	SC-SUB-G1300		$150,743
Collaborative Research: Predicting the global location of heat tolerant corals: Palau patch reefs as a general model	47.050			$28,936	$147,059
Collaborative Research: Probing the frictional behavior of the Tohoku megathrust using GPS, seismicity, and physics-based models	47.050				$81,917
Collaborative Research: Professional Engineering Pathways: A Longitudinal Study of Early Career Preparedness and Decision-Making.	47.041			$17,389	$17,389
Collaborative Research: RUI: Quantifying performance in animals exposed to predictable and unpredictable variation in multiple environmental factors	47.074				$24,780
Collaborative Research: Scalable Kilo-Pixel Detector Modules Based on Polarization Sensitive Multi-Chroic Aluminum Manganese MKIDs	47.049				$57,628
Collaborative Research: Scaling of Unsteady Locomotor Performance and Maneuverability	47.074			$98,289	$148,547
Collaborative Research: Scaling the Early Research Scholars Program	47.076				$26,187
Collaborative Research: SI2¿SSI: A Sustainable Open Source Software Pipeline for Patient Specific Blood Flow Simulation and Analysis	47.070				$55,675
Collaborative Research: SI2-SSI: Removing Bottlenecks in High Performance Computational Science	47.070				$112,125
Collaborative Research: Simulating crack propagation in steel structures under ultra-low cycle fatigue and low-triaxiality loading from earthquakes and other hazards	47.041				$102,247
Collaborative Research: Socially Assistive Robots	47.070			$20,866	$58,560
Collaborative Research: Stanford-Florida program in Support of LIGO on Coatings and Core Optics	47.049				$587,157
Collaborative Research: Structural and functional connectivity of squid chromatophores	47.074			$10,434	$117,765
Collaborative Research: Subgrid-scale models for large-eddy simulation of cloud formation and evolution	47.050			$1,883	$42,595
Collaborative Research: Sunlight Inactivation Mechanisms of Pathogenic Bacteria in Natural Waters	47.041				$3,095
Collaborative Research: Systematic Investigation of the Structure, Dynamics, and Energetics of Hydrogen Bonds and the Protein Interior Using Ketosteroid Isomerase and Model Systems	47.074				$160,651
Collaborative Research: The central Apennines Earthquake cascade under a new microscope	47.050				$61,965
Collaborative Research: The Gemini Planet Imager Exoplanet Survey	47.049				$70,971
Collaborative Research: The genetic, epigenetic, and immunological underpinnings of cancer evolution through treatment	47.049				$103,440
Collaborative Research: The Origin and Role of Dense Molecular Gas in Star-Forming Galaxies	47.049				$54,843
Collaborative Research: The SAGA Project: Satellites around Galactic Analogs	47.049				$66,604
Collaborative Research: Time-Sharing Experiments for the Social Sciences (TESS): Proposal for Renewed Support, 2016-2019	47.075				$146,831
Collaborative Research: Tolerance-Enforced Simulation of Stochastic Processes	47.049				$142,015
Collaborative Research: Tsunami Hazard to West Antarctic Ice Shelves	47.050				$72,077
Collaborative Research: US GEOTRACES PMT: Investigating geochemical tracers of the Pacific nitrogen cycle and budget	47.050			$14,597	$53,414
Collaborative Research: Visual Cortex on Silicon	47.070				$77,234
Collaborative Research: Wave driven flow through a shallow, fringing reef	47.050				$70,927
Collaborative Research: Waves in volcanic conduit-crack systems and very long period seismicity at Kilauea Volcano, Hawaii	47.050				$165
Columbia University Materials Research Science and Engineering Center	47.049	Columbia University	5(GG008600-13)		$39,255
Combinatorial optimization, spin models and the geometry of sparse random graphs	47.049				$73,476
Compositional and Temperature Controls on Structural Order, Dynamics, and Properties of Multicomponent Borosilicate Glasses	47.049				$59,518
Comprehensive Analysis of Transverse Gradient Undulator for Compact X-Ray FELs based on Laser Plasma Accelerators	47.049				$15,035

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CompSustNet: Expanding the Horizons of Computational Sustainability	47.070	Cornell University	72954-10597		$34,554
Concentration of Power	47.075	The Pennsylvania State University	5334-SU-NSF-0639		$18,439
Conference Proposal: Automorphic forms on reductive groups and their covers: A conference in honor of Solomon Friedberg	47.049				$9,672
Conference Proposal: Kylerec student workshop in symplectic and contact geometry	47.049				$19,930
Constraints on absolute magma chamber volume from geodetic measurements: Trapdoor faulting in the Galapagos	47.050				$40,903
Consumer Innovation Survey Development	47.075				$24,031
Consumption Network Effects	47.075				$14,737
Controlling the band structure of 2D semiconductors by their dielectric environment	47.049				$207,869
Convergence HTF: Collaborative Research with Ethical, Legal and Social Implications	47.070				$677
CPS: Breakthrough: Collaborative Research: The Interweaving of Humans and Physical Systems: A Perspective From Power Systems	47.070				$159,572
CPS: Breakthrough: Sufficient Statistics for Multi-Agent Systems	47.070				$21,085
CPS: Collaborative: In-Silico Functional Verification of Artificial Pancreas Control Algorithms	47.070	University of Colorado, Boulder	1555131/PO #1000818212		$1,770
CPS: Medium: Collaborative Research: Building Information, Inhabitant, Interaction and Intelligent Integrated Modeling (BI5M)	47.070				$10,321
CPS: Small: Collaborative Research: Models and System-Level Coordination Algorithms for Power-in-the-Loop Autonomous Mobility-on-Demand Systems	47.070				$15,259
CPS: Synergy: Collaborative Research: Enhanced Structural Health Monitoring of Civil Infrastructure Systems by Observing and Controlling Loads using Cyber¿Physical Systems	47.041				$47,074
CPS-Security: Synergy: End-to-End Security for the Internet of Things	47.070				$597
CQIS: A Quantum Electro-Optic Converter	47.041				$52,013
CRCNS: Collaborative Research: Naturalistic computation and signaling by neural populations in the primate retina	47.070				$40,323
Creating a new assessment tool for quantitative critical thinking in introductory lab courses	47.076			$75,069	$83,161
Creep Deformation in Shale at Submicron Scale	47.041				$22,854
CREX(Special creativity two year extension): Microwave Impedance Microscopy Study of Topological Structures of Quantum Systems	47.049				$64,093
CRII: CIF: Locality in Error Correcting Codes: Fundamental Trade-offs	47.070				($1,847)
CRII: III:Algorithms for Causal Inference on Networks	47.070				$54,871
Cross-cultural trust and resource sharing; The Role of Ideal Affect	47.075				$138,606
Crystal orientation and defect control in active and passive plasmonic systems	47.049				$94,493
CSR: Medium: Collaborative Research: GPL: General-Purpose Lambda Computing	47.070				$170,974
CSR:Medium: A Computing Cloud for Graphical Simulation	47.070				$23,504
Cytokinesis without an actomyosin ring: studies in Chlamydomonas	47.074				$299,896
D3SC and EAGER: Using Deep Learning to Find Algorithms for Optimizing Chemical Reactions	47.049				$50,701
Data-driven, biologically constrained biophysical computational model of the hippocampal network at full scale	47.070				($3)
DCL: Synthesis and Design Workshop: Weaving the Fabric of Adaptive STEM Learning Environments Across Domains and Settings	47.076				$57,457
DD: C2STEM: Learning by Modeling: A Collaborative and Synergistic Approach to K-12 Computing and STEM Education	47.076	Vanderbilt University	UNIV 58595		$234,370
Defining the classical and quantum limits of surface plasmon optics with hard-soft nanoantenna systems	47.041				$166,720
Design of self-assembling bio-inks for cell-based 3D printing	47.049				$8,664
Determination of Equilibrium Iron Isotope Fractionation Factors at High Pressure	47.050				$7,711
Development and Comparison of New Methods for Stabilizing Amputee Gait	47.041				$51,561
DFG/NSF: Novel Low Loss Coatings - Enabling the Third Generation of Gravitational-Wave Detectors	47.049				$56,264
Dimensions: Collaborative Research: Assembly and function of nectar microbial communities	47.074				$460,965
Discovering what matters: informative and reproducible variable selection with applications to genomics	47.049				$160,408
Disorder and Dynamics in Silicate and Aluminosilicate Liquids, Glasses, and Crystals Relevant to Geochemical Processes: Nuclear Magnetic Resonance Studies	47.050				$69,436
Dissecting the biogenesis and function of circular RNA in simple eukaryotes	47.074				$195,901
DISSERTATION RESEARCH: Mechanisms of host preference in the ectomycorrhizal symbiosis	47.074				$1,715
DMREF - Collaborative Research: Developing design rules for enhancing mobility in conjugated polymers	47.049				$86,615
DMREF Collaborative Research: Extreme Bandgap Semiconductors	47.049				$62,092
DMREF: Collaborative Research: Accelerating Thermoelectric Materials Discovery via Dopability Predictions	47.049	Colorado School of Mines	401279 - 5801		$58,027
DMREF: Collaborative Research: An integrated multiscale modeling and experimental approach to design fouling-resistant membranes	47.041				$35,091
DMREF: Collaborative Research: Programming mesostructured colloidal soft matter through complex quenching and annealing	47.041				$126,503
DMREF: Collaborative Research: Van der Waals Layered Materials: Building the Knowledge-Base, Synthesis and Characterization Methodologies for the New Frontier in Nanophotonics	47.041				$52,163
Doctoral Dissertation Improvement Grant: Analyzing Backlash against Gender Equity in Organizations	47.075				$2,553
Doctoral Dissertation Research in DRMS: Assessing the effectiveness of a collective efficacy-building approach at motivating resident engagement in invasive species control on private lands	47.075				$568
Doctoral Dissertation Research: Perceptions of College Value in an Era of Growing Female Advantage	47.074				($2)
Doctoral Dissertation Research: Responses to Islamist Political Violence and the Moderates' Dilemma	47.075				$17,936
Doctoral Dissertation Research: Search strategies and collaborative innovation of young firms: A natural experiment	47.RD				$10,048

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Doctoral Dissertation Research: The Cultural Meaning of Entrepreneurship: a Comparative Study of the U.S. and China	47.075				$12,000
Doctoral Dissertation Research: The emergence and evolution of cost-benefit analysis in US policymaking	47.075				$6,111
Doctoral Dissertation Research: The social structure of city action: Civic infrastructures as determinants of urban resilience	47.075				$9,767
Doctoral Dissertation Research: Yurok and Karuk Indian Prescribed Burns in Northwest California: Effects on forest dynamics and indigenous resource use	47.075				$814
Does in utero exposure to domoic acid cause temporal lobe epilepsy?	47.050				$61,600
Dynamics of Mesoscopically Structured Molecular Liquids	47.049				$36,585
E2CDA: Type I: Collaborative Research: Energy Efficient Computing with Chip-Based Photonics	47.070				$78,247
E2CDA: Type I: Collaborative Research: Energy Efficient Learning Machines (ENIGMA)	47.070				$167,537
E2CDA: Type II: A new non-volatile electrochemical transistor as an artificial synapse: device scaling studies	47.041				$56,404
E2CDA: Type II: Collaborative Research: Nanophotonic Lithium Niobate platform for next generation energy efficient and ultrahigh bandwidth optical interconnect	47.041				$112,556
EAGER SitS: Can remotely imaged vegetation characteristics provide a window into soil nutrient cycles?	47.050				$147,559
EAGER: A dynamic, reliability-weighted, multi-pass probabilistic framework to reduce uncertainty in crowd-sourced post-disaster damage assessments	47.041				$1,226
EAGER: Design of Generative Product Behavior using Morphing Algorithms	47.041				($788)
EAGER: Determinants of citizen science participation and data quality in coastal water quality monitoring	47.041				$8,730
EAGER: Enabling Quantum Leap: Room-temperature photon blockade and quantum gates using quantum dots in 2D materials	47.049				$138,928
EAGER: Enabling Quantum Leap: Temperature dependence of optical nonlinearities of monolayer transition-metal dichalcogenides	47.049				$238,656
EAGER: Exploring the coupled dynamics of urban systems using data science and micro-experimentation	47.041				$2,345
EAGER: Identifying Opportunities in Pseudorandomness	47.070				($4,359)
EAGER: Particle Concentration Measurements in Turbulent Flows using Magnetic Resonance Imaging	47.041				$18,705
EAGER:TDM Solar Cells: Collaborative Research: 30%-Efficient, Stable Perovskite/Silicon Monolithic Tandem Solar Cells	47.041				$36,807
EDGE: Developing techniques for linking genotype to phenotype in amphibians	47.074			$117,347	$465,955
Effective Preconditioners for High Frequency Wave Equations	47.049				$15,582
Effects of internal waves on mixing and transport by gravity currents	47.050				$128,147
Efficient Generation of N-Photon Bundles Using a Solid State Cavity QED System	47.049				($425)
Efficient Monte Carlo algorithms for Bayesian inference	47.049				$49,693
EFRI 2-DARE: Energy Efficient Electronics with Atomic Layers (E3AL)	47.041				$69,472
EFRI ACQUIRE: Distributed Quantum Computation Using Ion Chips and Integrated Photonics	47.041	University of Maryland	52220-Z3075201		$101,521
EFRI NewLAW: CMOS-Compatible Electrically Controlled Nonreciprocal Light Propagation With 2D Materials	47.041	North Carolina State University	2017-1718-03		$136,190
EFRI NewLAW: Engineering Resilient Photonic Structures and Devices with Broken Time-Reversal Invariance	47.041	Washington University in St. Louis	WU-17-126/PO 2928376C		$27,130
EFRI NewLAW: Mid-infrared topological plasmon-polaritons with 2D materials	47.041	University Of Minnesota	A006382203		$254,884
EFRI NewLAW: New frontiers for topologically-protected propagation of light, sound, elastic, and mechanical waves	47.041	University of Texas at Austin	UTA16-000937		$132,305
EFRI NewLAW: Non-reciprocal, topologically protected propagation using atomically thin materials for nanoscale devices	47.041	Emory University	T881192		$236,762
Emerging Frontier of Science Formation	47.070	Purdue University	10000686-017		$330,218
Emerging Materials for Energy storage and environmental Research enabled through Atomic Layer Deposition (EMERALD)	47.041				$178,256
Engineering Three-dimensional Stem Cell Niche with Independently Tunable Biochemical and Mechanical Properties	47.041				$60,031
Enhancing helicity-dependent optical interactions in inversion-asymmetric materials	47.049				$47,592
Establishing the genetic basis of hibernation by building and utilizing a next-generation genomics resource for the model hibernator, the thirteen-lined ground squirrel	47.074				$43,527
Estimation and testing in low rank multivariate models	47.049				$118,304
Estimation of Antarctic Ice Melt Using Stable Isotopic Analyses of Seawater	47.050				$139,760
Evolutionary Dynamics and Diversity in High Dimensions	47.049				$109,765
Experimental Investigation For the Characterization of the Geophysical Response of Rock-Fluid Interactions	47.050				$138,650
Fast Temporal Dynamics of Human Brain Activity During Emotional Processing	47.075				$53,715
FELLOWSHIP: Sustained-Petascale in Action: Blue Waters Enabling Transformative Science and Engineering	47.070	University of Illinois	067846-16996		$50,000
Financial Intermediaries in a Modern Economy: Risk Taking and Liquidity Provision	47.075				$126,822
Flexible Statistical Modeling	47.049				$79,877
Flexible Statistical Modelling	47.049				$96,229
FMitF: Collaborative Research: Track I: Finding and Eliminating Bugs in Operating Systems	47.070				$71,559
FRG: Collaborative Research: Crossing the Walls in Enumerative Geometry	47.049				$146,808
Functional Genomics Tools for Cnidarian-Dinoflagellate Symbiosis	47.074	Oregon State University	S1929A-C		$242,609
Fundamental Physical Understanding of Matrix-stabilized Combustion in Porous Media	47.041				$122,650
Fundamental Studies of the Hydrogen-Atom Hydrogen-Molecule Exchange Reaction	47.049				$121,301
FUSE: Food-water-energy for Urban Sustainable Environments	47.050				$205,504
FW-HTF Theme2:Collaborative Research: Enhancing Human Capabilities through Virtual Personal Embodied Assistants in Self-Contained Eyeglasses-Based AR Systems	47.041				$252,373
GEM: Extending the Capabilities of CubeSats for Measuring Radiation Belt Precipitation	47.050			$24,603	$120,779

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Geometric Structure of the Turbulent Cascade	47.041				$105,394
Geometry & Statistics	47.049				$293,261
Geophysics of Iron in the Earth's Core	47.050				$35,551
Global Urbanization and its Discontents: Wide View	47.075	Southern Methodist University	G001723-7505		$81,939
GOALI: SusChem: Organocatalysis: A Platform for Sustainable Polymer Chemistry.	47.049				$200,024
Grain Boundary-Activity Relationships in CO2 Electroreduction Catalysis	47.049				$88,596
Ground Motion Prediction Using Virtual Earthquakes	47.050				$83,363
Health Insurance Competition and Healthcare Costs	47.075				$13,968
Healthy Ecosystems, Healthy People: The Coupled Human Health and Environmental Dynamics of Schistosomiasis in Sub-Saharan Africa	47.075	University of California, Santa Barbara	KK1604		$1,329
Heat Transfer Processes in Rough Microchannels	47.041	University of California, San Diego	92149808/ MP Inv # S9001709		$62,835
Hemichordate neural organization: generating neural system diversity from conserved molecular patterning	47.074				$149,113
High resolution genome changes during evolution in a classic fisheries experiment	47.050			$95	$81
High-energy laser-proton acceleration from cryogenic hydrogen	47.049				$149,072
High-through scalable manufacturing of high-performance organic devices	47.041	University of California, Davis	201602722-01(A17-0377-S)		$36,545
High-Voltage High-Power-Density Power Electronics for Emerging Medical, Environmental, and Aerospace Applications	47.041				$108,456
How much does nest density matter? Using novel technology to collect whole-colony data on Adelie penguins	47.050	Point Blue Conservation Science	1834986		$3,368
IBSS: The Impact of Online Technologies on Interpersonal Communication and Perceptions	47.075	Wayne State University	WSU15138		$21,657
III: Small: Extracting Data and Structure from Charts and Graphs for Analysis, Reuse and Indexing	47.070				$93,109
IIS-RI: ICAPS 2017 Doctoral Consortium Travel Awards	47.070				$2,105
INFEWS/T1: Reducing the Environmental Impacts of FEW Systems In and Around Cities	47.050	University of California, Berkeley	00009606/PO# BB00986334		$26,783
Influencing Conflict-Related Emotional Dynamics	47.075				$86,687
Innovations in Development for a Transformative Scientist-Driven Public Engagement Model: The STEM Ambassador Program	47.076	University of Utah	10037087		$25,354
Insight software for network situational awareness	47.070	University of Tennessee	A16-0202-S002		$11,362
INSIGT: Investigating Shear-margin Interactions with Grounding-line Transitions	47.050				$123,377
INSPIRE: Architectural principles of coherent quantum networks and circuits	47.049				$110,853
Institute for Advanced Study/Park City Mathematics Institute	47.049	Institute for Advanced Study	7456-2305		$32,739
Integrated Circuit Cracking (ICC) with Linked Tools for Diverse Systems	47.074			$362,085	$1,090,130
Integrated Modeling and Control of Aftertreatment Systems for Clean, Efficient and High-Performing Gasoline Direct Injection Engines	47.041				$147,810
Integrated Simulation of Cloth Mechanics and Appearance for Predictive Virtual Prototyping	47.070	Cornell University	75054-10538		$45,543
Interfacing Spins with Photons: Quantum Many-Body Physics with Non-Local Interactions	47.049				$164,447
International Workshop on Numerical Modeling of Earthquake Motions: Waves and Ruptures	47.050				$7,216
Investigating the Large-Scale Solar Magnetic Field During the Transition to Solar Cycle 25	47.050				$37,882
Investigating the mechanics of cell division with a side-view Atomic Force Microscope	47.041				$26,661
Lanthanide-based probes for visualizing RNAs and proteins in live organisms	47.049				$75
Large Synoptic Survey Telescope (LSST) Project	47.RD	LSST Corporation	N51908C_#6 N51908C		$3,543,324
Laser Control of Quantum Evolution in Molecules	47.049				$227,527
Lattice gauge theories, importance sampling and quantum unique ergodicity	47.049				$72,351
Linking genetic diversity in benthic marine archaea to functional variability	47.083	University of Southern California	87388957 / PO 50708569		$94,670
Manifolds and Moduli Spaces	47.049				($1,592)
Mean Curvature Flow and Minimal Varieties	47.049				$96,722
Measurements of current-phase relationships in Josephson junctions	47.049				$29,718
Medicare Part D: An Analysis of the Supply Side of Incentives	47.075	National Bureau of Economic Research	36010.00.00.00		$5,156
Mental Conditioning and Health: A Cultural and Neurophysiological Study	47.075				$5,931
Methods in Extremal Combinatorics	47.049				$45,394
Microlocal analysis of linear and non-linear problems	47.049				$114,744
Microlocal Methods in Geometric Analysis	47.049				$43,632
Microstructural determinants of ion transport in ion exchange fuel cell membranes	47.041				($2,030)
Modeling Satellite Correlations of Aerosol Optical Depth Versus Cloud Optical Depth Over Megacities	47.050				$12,374
Moduli Problems in Algebraic Geometry, their Structures and their Applications	47.049				$70,402
Molecularly selective sensors based on organic semiconductors and artificial receptors: demonstrations and scaling studies.	47.041				$75,749
Monte Carlo and Quasi-Monte Carlo Methods for Statistics	47.049				$3,095
Moving from correlation to mechanism: testing the role of temperature and oxygen change in the Great Ordovician Biodiversification Event	47.050				$12,063
MRI: Collaborative Development of Sample Delivery Instrument for Femtosecond Diffraction Studies	47.074				$368,227
MRI: Development of a 150 GHz Receiver for the BICEP Array CMB Polarimeter	47.050	California Institute of Technology	S401848		$262,656
MSIP: Innovation to Achieve the Full Science Reach of the BICEP Array Stage 3 CMB Polarization Experiment	47.049			$264,149	$638,396
Multi-Physics Models for Proppant Placement in Energy Georeservoirs	47.041	University of California, San Diego	90882852		$16,669
Multivariate histograms and inference with finite sample guarantees	47.049				$34,550
Nanostraw-mediated Primary Immune Cell Reprogramming	47.RD	Navan Technologies, Inc.	1759075		$164,068
National Science Foundation's Alan T. Waterman Award	47.041				$45,691
NeTS: Large: Collaborative Research: GigaNets: A Path to Experimental Research in Millimeter Wave Networking	47.070				$48,120
NeTS: Small: Collaborative Research: A Fast and Flexible Transport Architecture for High Speed Networks	47.070				$4,406

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NeTS: Small: Massive Wireless Random Access: Principles and Protocols	47.070				$82,152
NeTS:SMALL:Video-Aware Network Transport + Network-Aware Video Coding	47.070				($541)
Neural investigations of face perception and attention using population receptive field modeling	47.075				$175,955
New Algorithms for Computing Equilibria of Stochastic Games	47.075	New York University	F8793-01/SES-1756215		$69,768
New Approaches to Reversible Homogeneous Electrocatalysts	47.049				$144,664
New Inks for 3D Bio-Printing based on Bio-orthogonal Click Chemistry	47.049				$179,646
NHERI Computational Modeling and Simulation Center	47.041	University of California, Berkeley	00009369 PO#BB00824561		$237,630
Nitrogen Fixation in Deep-Sea Sediments	47.050				$23,233
NNCI: Stanford Nano Shared Facilities	47.041				$1,345,664
Non-uniform sampling of permutations and large scale hypothesis testing	47.049				$83,452
Norovirus persistence in surface water	47.041				$3,771
Novel Chemistries for Nanoscale Surface Functionalization by Molecular Layer Deposition	47.049				$90,563
NRI: Balance Recovery Control for Amputees using Powered Leg Prostheses	47.070	Carnegie Mellon University	1122353-393882		$52,501
NRI: Collaborative Research: Versatile Locomotion with a Human-Scale Climbing Robot	47.070				$57,148
NRI: FND: COLLAB: Distributed Semantically-Aware Tracking and Planning for Fleets of Robots	47.070				$36,035
NRI: FND: COLLAB: Intuitive, Wearable Haptic Devices for Communication with Ubiquitous Robots	47.041				$198,314
NRI: INT: COLLAB: SYNDROME: SYNergetic DROne Delivery Network in Metropolis	47.041				$8,456
NRI: INT: Individualized Co-Robotics	47.041	Carnegie Mellon University	1122591-399765		$150,147
NRI: Liquid Handling Robots - A New Paradigm for STEM Education	47.041			$45,938	$105,870
NRI: Vine Robots: Achieving Locomotion and Construction by Growth	47.041			$121,893	$565,727
NRT: NeuroTech - Bringing Technology to Neuroscience	47.076				$90,008
NSF CAREER: The Effects of Public Policy on Families with Children: New Evidence from Multiple Large-Scale Data Sets	47.075				$48,216
NSF CAREER: Within City, Across Seasons or Across Borders: The Economics of Labor Movements	47.075				$114,843
NSF CBET: Stress formation and relaxation in colloidal dispersions: transient, nonlinear microrheology	47.041				$24,123
NSF Center for Power Optimization for Electro-Thermal Systems (POETS)	47.041	University of Illinois	2014-00555-03 073708-16479 (REU) 03708-16480 (RET) 088653-16967 (REU)		$713,129
NSF Engineering Research Center for Re-Inventing America's Urban Water Infrastructure	47.041			$1,980,744	$3,639,913
NSF Experimental Atomic Molecular and Optical Physics	47.049				($426)
NSF/ENG/ECCS-BSF: Sensing and Estimation under Energy and Communication Constraints	47.041				$82,647
NSF-BSF: SHF: Small: Certifiable verification of large neural networks	47.070				$51,455
NSFDEB-BSF: Collaborative Research: The fitness cost of every single mutation in the HIV genome	47.074				$33,611
NSFGEO-NERC: Collaborative Research: Energy transfer between submesoscale vortices and resonantly-forced inertial motions in the northern Gulf of Mexico	47.050				$58,210
NSFPLR-NERC: The Future of Thwaites Glacier and its Contribution to Sea-level Rise	47.050	University of California, Santa Cruz	A18-0296-S004-P0668401		$63,777
NSFPLR-NERC: TIME - Thwaites Interdisciplinary Margin Evolution - The role of shear margin dynamics in the future evolution of Thwaites drainage basin	47.050	University of California, Santa Cruz	A18-0296-S002-P0668511		$37,718
One-Dimensional Gases of Dysprosium	47.049				$124,139
OP: Collaborative Research: Highly Integrable Thin-Film Periodically Poled Lithium Niobate (TF-PPLN) Platform for Advanced Nonlinear Nanophotonics	47.041				($24)
Optical scale laser-driven electron accelerators for attosecond radiation sources	47.049				$1,246
Optomechanical antennas for silicon photonic beam-steering	47.041				$175,969
OPUS: Historical contingency in community assembly	47.074				$2,170
Organization and Dynamics in Photosynthetic Reaction Centers and Model Membrane Architectures	47.074				$247,941
OUT OF THE BOX AND INTO THE CLOUD: STRATEGIC PLANNING AT JASPER RIDGE BIOLOGICAL PRESERVE	47.074				($376)
Pathways from School to Work (PATHS): A Longitudinal Study of Undergraduate Engineering Students from College into the Workforce	47.041				$64,606
Physics-based Scale Enrichment for Eddy-Resolving Turbulence Simulations	47.041				$47,619
Physics-Based Volcano Geodesy with Application to Effusive Eruptions at Mount St Helens	47.050				$20,010
Physiological adaptions for a deadly diet: Bioaccumulation mechanisms of defensive chemicals in a poison frog	47.074				$214,171
Planning Grant: Engineering Research Center for Data for Socio-Physical Extreme Event Resilience (Data-SPEER)	47.041				$93,158
POLITICAL VIOLENCE AND STATE REPRESSION	47.075				$121,231
Postdoctoral Fellowship: The Changing Interface between Data, Theories and Communities in Neuroimaging Research	47.075				$99,287
Prediction of solar eruptions with machine-learning algorithms combining physical models and observations	47.050				$6,851
Properties of approximate inference for complex high-dimensional models	47.049				$63,685
Quantifying Uncertainties in Computational Fluid Dynamics predictions for Wind Loads on Buildings: GOALI Supplement	47.041				$153,620
Quantum chaos and quantum gravity from entanglement	47.049				$105,016
Q-WHIRL: Quantifying Wind Hazard Interference effects in ReaL urban environments	47.041				$32,426
Radiocarbon Dating and Chronological Modelling of Neolithic Çatalhöyük East	47.075				$20,668
RAISE: TAQS: Engineering high quality, practical qubits in diamond	47.041			$3,713	$153,854
RAISE: TAQS: Inverting the design paradigm: Tunable qubits in hybrid photonic materials as a scalable platform for quantum photonic devices	47.041	University of Delaware	51696		$138,887

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Random and Adaptive Projections for Scalable Optimization and Learning	47.070	University of Michigan	SUBK00009902/PO 3005179870		$112,804
Rapid Simultaneous Nucleic Acid Purification and Sequence-Specific Detection on a Handheld Printed Circuit Board Platform	47.041	University of California, Irvine	2014-3092		($26)
Reducing Attrition in STEM Doctoral Education: A Longitudinal Investigation using Momentary Assessment and Social Psychological Intervention.	47.076	The Pennsylvania State University	5664-SU-NSF-1214		$107,033
Refining a Model with Tools to Develop Math PD Leaders: An Implementation Study	47.076				$569,907
REGULATORY HIERARCHIES AND ROLES OF NON-CODING RNAs IN MAIZE ANTHERS	47.074	Donald Danforth Plant Science Center	23905-S		$145,614
Representations of Reductive Groups and Etale Hessenberg Varieties	47.049				$13,358
Research in Particle Theory, Cosmology, and Quantum Gravity	47.049				$836,157
Research Initiation: The Role of Internships in Developing Engineering Professional Identity for First Generation Low-Income Students	47.041	Elizabethtown College	SPO 135849		$6,727
RET Site: Teaching Engineering Design & Innovation	47.041				$177,141
REU Site: Language, Computation, and Cognition	47.075				$118,407
REU Site: Re-Inventing the Nation's Urban Water Infrastructure (ReNUWIt)	47.041			$68,296	$68,296
RI: Medium: Collaborative Research: Object-Centric Inference of Actionable Information from Visual Data	47.070				$41,646
RI: Medium: Deep Reading: Integrating Neural and Symbolic Models of Meaning	47.070				$97,468
RI: Small: Deriving and Exploiting Shape Semantics	47.070				$142,498
RI:Medium: Collaborative Research: Incorporating Biologically-Motivated Circuit Motifs into Large-Scale Deep Neural Network Models of the Brain	47.070				$176,125
RIDIR: Integrated Media Database and Computational Tools for Multimodal Analysis of Inter-media News Flow and Agenda Setting in Mass and Social Media	47.075				$45,289
RNMS: Geometric Structures and Representative Varieties	47.049				$18,038
Robust and Low-cost Smart Skin with Active Sensing Network for Enhancing Human-Robot Interaction	47.070				$316,183
Robust machine learning methods for messy data	47.070				$46,626
RoL: EAGER: DESYN-C Spontaneously Synthesized RNA Protocells for Biological Catalysis	47.041				$37,069
Role of tomato bHLH transcription factors in development and immunity	47.074				$228,886
RUI: COLLABORATIVE RESEARCH: BUILDING A MECHANISTIC UNDERSTANDING OF WATER COLUMN CHEMISTRY ALTERATION BY KELP FORESTS: EMERGING CONTRIBUTIONS OF FOUNDATION SPECIES	47.050				$44,173
S&CC-IRG Track 2: Smart & Connected Kids for Sustainable Energy Communities	47.070	Oregon State University	S1977A-A		$147,897
S2I2: Institute for Research and Innovation in Software for High Energy Physics (IRIS-HEP)	47.070	Princeton University	SUB0000280		$11,388
SaTC: CORE: Frontier: Collaborative: End-to-end Trustworthiness of Machine-Learning Systems	47.070				$162,661
SaTC: CORE: Medium: Collaborative: An algebraic approach to secure multilinear maps for cryptography	47.070				$32,000
SaTC-EDU: EAGER: Cybersecurity education for makers of public policy	47.076				$191,041
SBE: Medium: Collaborative: Understanding and Exploiting Viceral Roots of Privacy and Security Concerns	47.075				$2,595
SCEC5 Research Collaboration at Stanford University	47.050	University of Southern California	91270823 / PO 10617840		$324,571
SCH: INT: Collaborative Research: A Non-invasive and Wearable Molecular Diagnostic Platform for Remote and Passive Monitoring of Patients at Risk for Sepsis	47.070				$46,293
Searching for Dark Matter Subhalos in Distant Strong Gravitational Lenses	47.049				$75,619
Seeking Synergy Between Technological and Ecological Systems for Sustainable Engineering	47.041			$18,615	$18,615
SEES Fellows: Building Informatics: Utilizing Data-Driven Methodologies to Enable Energy Efficiency and Sustainability Planning of Urban Building Systems	47.070				$105,039
SemiSynBio: Highly scalable random access DNA data storage with nanopore-based reading	47.RD				$289,439
Sensorimotor neural oscillations and social personality correlates for perception and performance of musical joint-action tasks	47.075				$6,517
SHF: Medium: Collaborative Research: From Volume to Velocity: Big Data Analytics in Near-Realtime	47.070				$55,354
SHF: Medium:PRISM: Platform for Rapid Investigation of efficient Scientific-computing & Machine-learning	47.070				$279,997
SHF:Medium:Stochastic Program Optimization	47.070				$135,574
Shock Tube Measurements of Aldehyde and Ketone Rate Constants Using Enhanced Laser Absorption	47.041				$35,149
SI2-SSI Collaborative Research: The SimCardio open source multi-physics cardiac modeling package	47.070				$334,528
Singularities in General Relativity	47.049				$50,937
Solute Trapping in Low-Temperature Vapor-Liquid-Solid Growth: A Route to Direct-Gap Ge-Sn Single Crystal Nanowires	47.049				$82,663
Solving the Equation: Recruiting, Hiring, and Retaining Math and Science Teachers	47.075			$265,479	$300,479
Spatiotemporal measurements of the Kondo cloud	47.049				$10,174
Spectroscopic Elucidation of Cu and Fe Active Sites in Zeolites	47.049				$152,446
Spin Functionality in Perovskite Stannates Through Complex Oxide Heteroepitaxy	47.049				$135,795
Spokes: MEDIUM: WEST: Breaking down barriers for reproducible neuroimaging data analyses	47.070				$131,829
SRC-NEEDS Partnership: Stanford November 11, 2012	47.041	Purdue University	4101-54690		($51)
Standard Grant: Glass Ceilings to Diversity	47.075				$81,651
Stanford Institute for Theoretical Economics Summer Workshop	47.075				$85,544
Stanford Program in Support of LIGO - Seismic Isolation and Controls	47.049				$481,035
Statistical Methodology and Applications to Engineering and Economics	47.049				$106,061
Statistical Theory and Methodology	47.049				$108,091
STEP Center: EHR-ENG STEP Innovation Center	47.076			($1,413)	($1,413)
Structural architecture and evolution of the southern flank of the Brooks Range fold and thrust belt, Arctic Alaska	47.050				$33,125
Structural Dynamics of Ribosome Complexes By Using Time-resolved Serial Femtosecond X-ray Kinetic Crystallography	47.074	Hauptman-Woodward Medical Research Institute	6229		$23,937

STANFORD UNIVERSITY
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AWARD EXPENDITURE DETAIL
Year Ended 8/31/2019

Federal Grantor/Federal Program Title	Federal CFDA Number	Pass-Through Entity Name	Pass-Through Entity Identifying Number	Amount Passed through to Sub-Recipients	Total Federal Expenditures
Structure/Function Correlations Over Binuclear Non-Heme Iron and Related Enzymes	47.074				$83,215
Structure-property relationships in novel conjugated mixed conductors	47.049				$103,028
Subcontract from Yale for Rhiju Das	47.049	Yale University	GR104446(CON-80001438)		$63,782
Submesoscale instabilities near the sea-floor and their effects on the ocean circulation and mixing	47.050				$168,023
Superconductor-(Metal)-Insulator Transitions: Understanding the Emergence of Anomalous Metallic States	47.049				$180,152
Surface elevation history of the northern North America Cordillera as constraint for Eocene tectonic and climatic boundary conditions	47.050				$84,411
Symplectic Topology of Weinstein manifolds and related topics	47.049				$43,374
Symposium: 50 Years of Radioglaciology	47.050				$19,522
Synthesis and Analysis of Heap Data Structures	47.070				$121,241
Systems for Assisting in Emotion Regulation in the Wild	47.070				$34,132
Syzygies, Moduli Spaces and Brill-Noether Theory	47.049				$48,660
Tensor hypercontraction for electronic structure and first principles molecular dynamics	47.049				$54,301
Tensor Network Computation: Representations, Algebra, and Applications	47.049				$55,772
The 2019 HRI Pioneers Workshop at the 2019 ACM/IEEE International Conference on Human-Robot Interaction	47.070				$20,084
The Cultural Life of Communism in Kerala	47.075				$2,436
The Genetic, Epigenetic & Immunological Underpinnings of Cancer Evolution through Treatment	47.RD	Memorial Sloan-Kettering Cancer Center	SU2C 2015-003 / PO: BD519953		$32,775
The Hopkins Microbiology Course	47.074				$6,754
The Rheology of Complex Suspensions In Viscoelastic Suspending Fluids	47.041				$283,083
The Role of Catalyst Microstructure in Gas Diffusion Electrosynthesis of C2+ Products	47.049				$36,757
THE ROLE OF NON-CODING RNA IN THE MODULATION OF ANTHER & POLLEN DEVELOPMENT IN GRASSES	47.074	Donald Danforth Plant Science Center	23908-S		$346,613
The Social Value of Financial Expertise	47.075				$32,134
The Structure of the Gromov-Witten Invariants	47.049				$37,896
The SuperCDMS SNOLAB Experiment	47.049	University of California, Berkeley	00008790 PO# BB00544128		$1,338,203
The Welfare Effects of E-Commerce and Entry in U.S. Retail	47.075				$178,883
Theoretical modeling of protein-driven chromosomal dynamics and biological function	47.049				$78,015
Theory of order and fluctuations in quantum materials	47.049				$171,422
Thermo-Mechanics and Hydrology of Western Antarctic Ice Stream Margins	47.050	Harvard University	123844-5093242		$54,705
Three-Dimensional Crack Propagation Algorithms Based on Universal Meshes and their Application to Fracking	47.041				$140,622
THz Driven Electron Gun	47.049				$101,438
To provide leadership and ensure the vitality of the Nation's science, technology, engineering and mathematics (STEM) education enterprise	47.076				$19,643,716
Topics in Number Theory	47.049				$84,185
Toward the Design and Control of Dynamical Transport Barriers in Nonlinear Flow	47.041				$101,575
Towards the border of symplectic rigidity and flexibility	47.049				$4,912
Transport of Non-Spherical Particles in Wavy Flows	47.041				$140,931
TRAVEL: Travel to Workshop on Behavioral Risk Modeling for Pandemic Prevention and Response	47.075				$2,781
TRIPODS+X:RES: Collaborative Research: The Future of the Road - A Data-Driven Redesign of the Urban Transit Ecosystem	47.049				$10,410
TWC: Frontier: Collaborative:CORE: Center for Obfuscation Research	47.070				$93,545
TWC:Small:Collaborative: Computation and Access Control on Big Multiuser Data	47.070				($55)
Two Higgs are Better than One: Investigating Electroweak Symmetry Breaking at the LHC and Beyond with Real-Time Charged Particle Reconstruction	47.049				$202,254
Two-dimensional KPZ evolution, fluctuation lower bounds, and ultrametricity	47.049				$56,678
Two-Dimensional Synthetic Quantum Matter	47.049				$51,241
U.S. ATLAS Operations: Discovery and Measurement at the Energy Frontier	47.049	Stony Brook University, State University of New York	76749/1136652/2		$126,108
Uncertainty Quantification and Bayesian Updating in Data-Driven Cardiovascular Modeling	47.041			$3,838	$163,307
Understanding Gravity at the Smallest Scale	47.049				$154,316
Understanding neurodegeneration across the scales	47.041				$52,127
Understanding the Link Between Structure, Processing and Electronic/Ionic Properties in Soft Mixed Conductors	47.049				($261)
Understanding the productivity of the world's most numerous firms: evidence from surveys and satellites	47.075				$7,453
Unique Functionals and Quantum Groups	47.049				$25,857
United States-Japan Polymer Symposium: "Macromolecules: Challenges and Opportunities for the 21st Century."	47.049				$5,080
UNS: Collaborative Research: Multiscale interactions between active particles and stratified fluids during collective vertical migration	47.041				$2,938
VEC: Small: Collaborative Research: The Visual Computing Database: A Platform for Visual Data Processing and Analysis at Internet Scale	47.070				$45,915
Virtual Solar Observatory Development	47.049	Association of Universities for Research in Astronomy	N94531C-N		$39,476
Visitor Interactions in Microbiology: A New Genre of Science Museum Exhibits	47.041			$38,774	$40,554
Waves and fronts in heterogeneous media	47.049				$112,151
WERF, WRF: Collaborative Research:Quantifying the Contribution of Disinfection Byproducts to the Toxicity of Wastewaters Purified for Potable Reuse: Which Byproduct Classes Matter?	47.041				$50,973
Workshop on the future of coastal and estuarine modeling	47.050				$1,427
Workshop: Advances in asymptotic probability	47.049				$35,000
Workshop: Localizing Representations in the Brain with Neuroimaging Technologies	47.075				$20,417
Social Security Administration					**$44,999**
Working trajectories, health, and patterns of disability and retirement	96.007	Boston College	5002112-BC18-S2		$44,999
U.S. Agency for International Development					**$493,725**
Asili Project Evaluation in the Democratic Republic of Congo	98.RD	American Refugee Committee	AID-OAA-14-00060 (Asili)		($6,667)

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AWARD EXPENDITURE DETAIL
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Federal Grantor/Federal Program Title	Federal CFDA Number	Pass-Through Entity Name	Pass-Through Entity Identifying Number	Amount Passed through to Sub-Recipients	Total Federal Expenditures
Mexico Clean Economy 2050: Carbon Policy & Innovation for the Energy Transition and Smarter Growth	98.001				$119,291
Strengthening Facilities for Health - Cambodia	98.001	University Research Corporation	FY14-A05-7017		$11,774
System-scale planning to support sustainable energy systems and conservation of freshwater resources for people and nature	98.RD	WORLD WILDLIFE FUND	1224330-200-AABYU		$16,441
USAID Bureau for Food Security	98.001	The College of William and Mary in Virginia	740681-74171D		$352,886
Grand Total					**$834,228,293**

Schedule of Expenditures of Federal Awards
Part B, Summary of Program Clusters

STANFORD UNIVERSITY
SCHEDULE OF EXPENDITURES OF FEDERAL AWARDS PART B
SUMMARY OF PROGRAM CLUSTERS
Year Ended 8/31/2019

Federal Grantor/Federal Program Title	Federal CFDA Number	Pass-Through Entity Name	Pass-Through Entity Identifying Number	Amount Passed through to Sub-Recipients	Total Federal Expenditures
RESEARCH AND DEVELOPMENT CLUSTER					**$742,971,674**
Corporation for National and Community Service					**$582,919**
Social Innovation Fund Administrative Data Pilot	94.024				$582,919
Department of Agriculture					**$242,777**
Assessing cover crop as an adaptation to improve climate resilience of the US Midwest agro-ecosystems: integrating biophysical modeling, data science, and crop insurance analyses	10.310	University of Illinois at Urbana Champaign	09211-17062		$13,680
Circulating Tumor DNA (ctDNA) and liver cancer - Building capacity for future molecular research and cancer prevention in Mongolia	10.001	CRDF Global	DAA2-17-63002-1		$3
Evaluation of Save the Children's PALAM/A project in Sri Lanka	10.RD	American Institutes for Research	D473100002		$3,598
Investigating tomato immune signaling pathways through the study of the Xanthomonas T3S effector target Tomato Atypical Receptor Kinase 1	10.310				$44,463
Predicting the resilience of carbon sequestration and productivity of forests and grasslands to changes in fire	10.310				$105,793
Predicting the response of soil carbon stocks to changes in plant inputs across spatiotemporal scales	10.310				$75,240
Department of Commerce					**$907,464**
A Risk-based Approach to Interpreting Fecal Source-associated Microbial Source Tracking (MST) Marker Concentrations (California Sea Grant Omnibus 2014-2018, Years 1-4)	11.417	University of San Diego	84414221		$4,933
Biosphere-atmosphere regulations of droughts assessed using microwave and solar-induced fluorescence observations and improved plant water stress representation	11.431	Columbia University	1(GG008692)		$9,150
Data Driven Predictive Models for Smart Manufacturing	11.609				$79,232
Foundational Grant of the Joint Initiative for Metrology in Biology (JIMB)	11.620				$303,111
Improving Estimates of Natural Mortality of Atlantic Bluefin Tuna with Electronic Tags	11.472	The Ocean Foundation	138979		$64,683
JIMB Shared Research Facility	11.609				$43,445
Reliably Inferring the Sun's Far-Side Magnetic Flux for Operations Using Time-Distance Helioseismic Imaging	11.468				$199,403
Seismic Assessment, Retrofit Strategies and Policy Implications for Vulnerable Existing Steel Buildings	11.609				$133,550
Stanford NIST JIMB Training Grant	11.620				$69,957
Department of Defense (DOD)					**$69,480,549**
"Quantum Metaphotonics and Metamaterials: from Single Emitters to Strongly Correlated Systems"	12.800	Brown University	FA-99550-12-1-0488 00000556		($3,763)
(MURI 15) ATOMICALLY-THIN SYSTEMS THAT UNFOLD, INTERACT AND COMMUNICATE AT THE CELLULAR SCALE	12.800	Cornell University	76123-10600		$376,221
10.2.3 Social Network Analysis: Brain predictors of social network structure and function	12.431			$3,673	$304,372
A basic research pipeline for discovery and early preclinical development of host-targeted antiviral strategies to combat encephalitic alphaviruses	12.351			$114,434	$560,355
A General and Ultra-high-performance Platform for Nonlinear Photonics	12.910				$23,536
A Modeling-Based Personalized Screening Strategy Combining Circulating Biomarker and Imaging Data for Breast Cancer Early Detection	12.RD				$148,265
A multiscale nested modeling framework to simulate the interaction of surface gravity waves with nonlinear internal gravity waves	12.300				$43,351
A Nested Mixed-Methods Approach to Armed Non-State Actor Governance and the Rule of Law	12.630	George Mason University	E204334-1		$22,152
A proposal to study the effect of unsteady wall boundary conditions on turbulent boundary layers	12.RD				$71,256
A Prosthetic Foot Emulator to Optimize Prescription of Prosthetic Feet in Veterans and Service Members with Leg Amputations	12.420	Seattle Institute for Biomedical and Clinical Research (SIBCR)	MD13-STAN-2		$16,290
A Rapid Blood Test to Differentiate Latent Tuberculosis from Active Disease	12.420	University of California, San Diego	113394183 PO S9002292		$101,466
Accelerating knowledge extraction from large-scale multi-data sources by incorporating prior knowledge with deep learning	12.910			$19,881	$80,605
Accountable Protocol Customization	12.300				$26,680
Acoustic Power and Data Links for Deep Tissue Wireless Implants	12.910				$58,331
Active Metasurfaces for Advanced Wavefront Engineering and Waveguiding	12.800	Harvard University	123885-5079400		$264,691
Advanced multi-length characterization of inherently safe lithium-ion battery	12.300				$125,594
Advanced Ship-handling Simulators	12.RD	Charles River Analytics Inc.	SC1800101		$35,850
Advanced state of charge determination in phase-separating electrodes for battery cells and in individual particles	12.300				$194,914
AFOSR: Equipment for a dysprosium multimode cavity QED science chamber and pump laser	12.800				$44,513
AI for Education: Designing Conversational Teaching Agents	12.300				$202,586
AI Nets: Predicting Actions and Inferring Intentions of Groups of Targets with a Network of Surveillance Robots	12.300			$1,017	$121,174
ALD/Encapsulated Thermal Accelerometer	12.910				$459,857
Alloantibodies in the Treatment of Breast Cancer	12.420				$104,036
Amortized Inference for Probabilistic Programs	12.300			$280,295	$287,889
Anti-Lysophosphatidic acid antibodies in the treatment of post-TBI neuropathic pain	12.RD				$192,407
Aperiodic Silicon Photonics: Inverse Design, Fast Algorithms, and Fundamental Aspects	12.800				$28,465
Architecture and Analysis for High-Assurance Autonomy	12.RD	Rockwell Collins	PO-4506642848		$518,980
Army High Performance Computing Research Center	12.RD			($20,042)	$541,211
Artificial-intelligence aided findings detection models for diagnostic imaging in Prostate Cancer	12.420				$141,517
Assessment and Scaffolding for Learners of Complex, Dynamic Domain Knowledge: With Application to Ship Handling	12.300				$286,748
Atypical Opioid Mechanisms of Control of Injury-Induced Cutaneous Pain by Delta Receptors	12.420				$128,875
Avian-Inspired Multifunctional Morphing Vehicles	12.800	University of Michigan	3003832414		$206,921

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SUMMARY OF PROGRAM CLUSTERS
Year Ended 8/31/2019

Federal Grantor/Federal Program Title	Federal CFDA Number	Pass-Through Entity Name	Pass-Through Entity Identifying Number	Amount Passed through to Sub-Recipients	Total Federal Expenditures
Basic principles of optical read-write manipulations of sensory cortex and perception	12.910				$180,747
Basic Single-Event and Total-Ionizing Dose Mechanisms in Ge/InGaAs-based CMOS Transistors with ALD High-k Dielectric	12.351			$22,824	$24,563
Better Reinforcement Learning with Online Representation Discovery and Sample Efficient Learning	12.300				$232,978
BHMC Building Healthy Military Communities	12.750	Henry M Jackson Foundation for the Advancement of Military Medicine	3352 / PO 886051		$39,596
BIGMAPS: Brain Imaging for Global Motifs of Activity Pattern and Structure NeuroFAST	12.910			$109,002	$1,508,387
Binder-Finder through Machine-Learning (BFML)	12.910				$38,897
Biofidelic 3-Dimensional Brain Surrogate Models of mTBI-Induced Alzheimer's Disease Pathology	12.420			$14,732	$14,395
Biological Cartography of Threat Space (BIOCATS)	12.RD	SRI International	PO17395		$59,749
Biomechanical and energetic analyses of whale-borne tag sensor data to assess the population consequences of acoustic disturbance	12.300				$96,513
Biometric Stem Cell Dressing for Skin Regeneration	12.420	Wake Forest University	WFUHS 441013 SR-03		$15,692
Biomimetic organic electronic transistors for characterizing host cell-pathogen interactions	12.431			$343,148	$499,143
Brain strain and neck muscle dynamics during sagittal head impacts in naval scenarios	12.300				$186,476
Brain Trauma Evidence-based Consortium (B-TEC)	12.RD			$250,947	$766,377
Catalytic Synthesis of Shape-Persistent Ladder Polymers and Control of Their Intrinsic Microporosity	12.431				$28,510
Cellular and Molecular Characterization of ER + Breast Cancer	12.420				($423,126)
Center for Advanced Organic Photovoltaics	12.300	Georgia Institute of Technology	AWD-100927-G2 / PO-5006745		$96,759
Center for Distributed Quantum Information (CDQI)	12.431	University of Maryland	48635-Z8401006		$111,190
Center for Turbulence Research (CTR) Summer Program	12.800				$11,844
Center for Turbulence Research Summer Program	12.300				$11,041
Characterizing Dusty Plasmas Formed by Hypervelocity Impacts Through Experiments and Particle-In-Cell (PIC) Simulations	12.800				$221,713
Chemistry with Microdroplets	12.800				$61,461
Circuit Integration for Robust Quantum Information Technology Scalability (CIRQuITS)	12.RD	Vector Atomic	VAS-18-0002/W911NF19P0006		$49,812
Coherent Control of Molecular Scattering Using Stark-Induced Adiabatic Raman Passage	12.431				$215,831
Collaborative Decision Making at Scale: Bridging Theory and Practice	12.300				$26,971
Comparing hospital hand hygiene in Liberia: soap, alcohol, and hypochlorite	12.750	Henry M Jackson Foundation for the Advancement of Military Medicine	4058 // PO 927761		$134,746
Complex Event Recognition from Open Source Social Media (CEROSS)	12.RD	SRI International	PO8873		$22,639
Computational Methods for Air Traffic Modelling in Terminal Airspace	12.RD	MIT-Lincoln Laboratory (DOD)	7000406644		$58,656
Corticospinal neuron transplantation to repair chronic cervical spinal cord injury	12.420				$231,103
Data Geometry, Semantics, and Information	12.300				$352,508
Decentralized Tactical Modular Teaming for Real-World UAS Networks	12.910				$218,926
Deep Models of Compositionality and Context	12.431				$902,424
Defining the role and therapeutic potential of Notch signaling in aggressive prostate cancer	12.420				$167,638
Depth Insensitive Pressure/Vector Sensor Arrays	12.RD	Intelligent Fiber Optic Systems Corporation	SBIR Phase II		$63,560
Design of Optimal Loss Functions for Statistical Estimation	12.300				$138,440
Developing Methods of Control of Self-Organized Plasma Structures in Devices Relevant to Electric Propulsion	12.800	Princeton University	SUB0000171		$63,088
Developing New Simulation Models for Machine Learning	12.300				$70,733
Development and preclinical validation of an improved tissue engineered vascular graft for use in congenial heart surgery	12.420	The Research Institute at Nationwide Children's Hospital	710049-0921-00/PO4602317-0-46		$79,525
Development of a Rapidly-acting Preventative Therapy for Influenza	12.RD	DNARx	HR0011940279		$229,812
Development of a Rapidly-acting Preventive Therapy for Influenza	12.RD	DNARx	HR0011940279		$130,724
Development of HyChem - A Jet and Rocket Fuel Combustion Chemistry Model	12.800				$619,773
Development of Targeted, Immune-Based Immunosuppression for Composite Tissue Transplantation	12.420				$2,998
Differential Resonant Beam Accelerometer Phase 4	12.910				$800,114
Dimension reduction for open quantum systems	12.431				$144,392
Dimensional Reduction of Highly Nonlinear Multiscale Models Using Most Appropriate Local Reduced-Order Bases	12.800				$316,960
Dissecting the causal role of neural dynamics in supporting computation and behavior	12.300				$83,027
Distinguishing Benign from Malignant Breast Lesions: Does Breast Interstitial Fluid Hold the Answers?	12.420				$66,508
Distributed Robust Data-Driven Control and Optimization	12.910	University of California, San Diego	101513612,S9001951		$84,767
DNA origami scaffolds for single-particle cryo-Electron Microscopy of viral RNA	12.300	Massachusetts Institute of Technology	62284		$80,871
Doing more with Less: Accelerating the Analyst from Modeling down to the Hardware	12.910				$745,706
Dual PET/Fluorescence Imaging of Glioma with an MMP-14 Activabable Peptide Probe	12.420	University of Alabama	000518502-001		$99,271
Earth Materials and Processes: Scale Dependence of Governing Laws in Earth Materials	12.431				$87,325
Efficacy of Repetitive Transcranial Magnetic Stimulation for Improvement of Memory in Older Adults with TBI Problems in Complex TBI	12.420	Palo Alto Veterans Institute for Research	ADA0007-01; PO# ADA074575		$22,061
Embedded Humans: Provably Correct Decision Making for Networks of Humans and Unmanned Systems	12.300	University of California, Berkeley	PO: BB01078656 SA 8173		$65,663
Energy-Efficient Nanophotonic Neuromorphic Computing	12.800	University of California, Davis	A18-0583-S001		$196,785
Engineering a plant chassis for rapid and scalable production of small molecule therapeutics	12.910				$190,846

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SCHEDULE OF EXPENDITURES OF FEDERAL AWARDS PART B
SUMMARY OF PROGRAM CLUSTERS
Year Ended 8/31/2019

Federal Grantor/Federal Program Title	Federal CFDA Number	Pass-Through Entity Name	Pass-Through Entity Identifying Number	Amount Passed through to Sub-Recipients	Total Federal Expenditures
Engineering diamond quantum optical systems for quantum computing and simulations	12.431				$189,823
Engineering Functionality in Emergent Oxide Thin Film Materials Systems	12.300				$679,604
Engineering light-mediated interactions in dysprosium for quantum many-body physics	12.800				$237,911
Engineering the translation apparatus for synthesis of electronically active sequence-defined polymers	12.431	Northwestern University	60044193 STAN		$83,995
Enhancing Mechanical and Combustion Properties of Boron/Polymer Composites via Engineered Interfacial Chemistry	12.300				$181,649
Enhancing the resolution, sensitivity, and bandwidth of a quantum sensor for imaging technologically relevant materials	12.300				$169,113
Enhancing Vascularized Composite Allograft Survival with miR-181a-Expressing Liver Plasmacytoid Dendritic Cells	12.420				($221)
Epidemiologic Study of SCT and Risk Factors for Exertional Injuries	12.750	Henry M Jackson Foundation for the Advancement of Military Medicine	Subaward 2549 PO # 827119		$240,293
Epigenome editing and reactivation of X-linked FOXP3 for treating breast cancers	12.420				$183,842
ERGO: Exploiting Risk-taking in Group Operations	12.RD	MIT-Lincoln Laboratory (DOD)	P.O. 7000443045		$23,737
Establishing the Operational Capacity of the Animal Telemetry Network Data Assembly Center	12.300				($96)
Experimental and Theoretical Design of Multi-Tasking Catalysts: New Routes for the Synthesis of Precision Polymeric Materials	12.300			$155,541	$188,085
Experimental characterization of 2D exciton coherence area for MoSe2	12.431				$11,993
Experiments Investigating Resilience	12.RD			$159,799	$1,673,813
Exploring solid-state high-harmonic generation as a potential attosecond source for materials characterization	12.800				($216)
Extracting Information from Rich Video Streams: An Agile Software/Hardware Approach	12.901				$1,568,169
EXtreme Electron Concentration Oxide DEvices (EXEDE)	12.300	University of California, Santa Barbara	KK1318		($129)
Formation and Dynamics of Peer Groups in Online Learning Environments	12.300				$178,639
Fundamental Aspects of NO IR Spectroscopy in High T and P Air	12.800				$123,198
Fundamental Understanding and Modeling of Multi-Phase Flows at Transcritical Conditions	12.431				$1,384
Fusion genes predict prostate cancer recurrence	12.420				$187,588
Ga-68 Bombesin PET/MRI in patients with biochemically recurrent prostate cancer and non-contributory conventional imaging	12.420				$394,016
Game-theoretic mechanisms for group decision making	12.300				$44,357
Getting More from Less: Optimal Estimation and Learning, For Sparse, High Dimensional, or Untrusted Data	12.300				$114,428
Global stability and sensitivity analysis of a hypersonic slender cone	12.300				$355,231
Gravitational sensors based on atom interferometry	12.351				$194,812
Hardware-Up Security: Anti-fragility and Automation	12.RD	Columbia University	1(GG008732)		$129,418
HERMES: Hybrid Efficient Reasoning Methods for Explainable and Scalable formal methods	12.RD	United Technologies Research Center	1239372 1195604-1-GWMTW		$257,344
High Magnitude Field STM System for Studies of Topological Insulators and Related Systems	12.431				$669
High Performance Roll-to-Roll Coated All-Polymer Solar Cells	12.300				$318,901
High¿Speed Air Breathing Propulsion and Structural Interactions Research	12.RD	Universal Technology Corporation	187900001103C1;FA865 014D2411		$231,442
High-Assurance Cryptography	12.300			$593,267	$814,434
High-Expressivity World Modeling	12.RD	SRI International	PO20681		$272,235
High-fidelity Simulations and Predictive Modeling of Jet Screech.	12.300				$209,565
High-Fidelity Verification and Validation of Spaceborne Vision-Based Navigation Systems	12.800				$393,508
High-Order Methods and High Fidelity Simulation of Unsteady Turbulent Fluid Flows	12.800			$58,103	$72,853
High-Performance and Reliable Automated Carrier Landing via CFD-Based Model Predictive Control	12.300				$241,904
High-Speed DACs for Digital Arrays in Digital Process Technology	12.910				$213,038
Homo SocioNeticus: Scaling the cognitive foundations of online social behavior	12.RD	Virginia Polytechnic and State University	450522-19751		$90,380
Human Intent Aware Decision- Making Planning	12.RD	MIT-Lincoln Laboratory (DOD)	7000441073		$67,759
Human-Centered Design and Control of Vine Robots for Disaster Scenarios	12.630				$200,996
Hybrid Aluminum and Porous Si as High Performance Energetic Materials	12.300				$16,033
Hybrid-Materials Valley Optoelectronics for Photon Spin Communication	12.800	Cornell University	FA9550-18-1-0480		$143,610
Identify and target innate immune checkpoints to treat metastatic breast cancer	12.420				$386,187
Identifying mechanisms of degradation in perovskite solar cells and improving their stability	12.300				$100,217
Immune Responses Associated with Acute Pancreatitis	12.420				$714,044
Improving RANS for 3D Flows Using Machine Learning and Model Interpretation	12.300				$68,369
Information-Geometric Approach for Data-Driven Multiscale Simulations	12.800				$212,061
iNGOT: The Next Generation of Obfuscation Techniques	12.RD			$43,256	$396,008
Interactive data analysis with statistical guarantees	12.431				($2,342)
INTERCEPT: Interfering and Co-evolving Prevention and Therapy	12.910	University of California, San Francisco	9994sc		$581,827
Internal Cooling of Fiber, and Disc lasers by Radiation Balancing and other Optical or Phonon Processed	12.800	University of Illinois at Urbana Champaign	084272-16070		$271,565
Investigating Epigenomic Reprogramming in Human Melanoma Development	12.420				$89,817
Investigation of Deep Learning for Solid and Fluid Simulations	12.300				$37,943
IQGAP1 Scaffold-Kinase Interaction Blockade In Renal Cell Carcinoma: A Novel Biomarker And Therapeutic Strategy	12.420			$29,546	$247,242

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JTO MRI: Power Scalable Electrically Driven Monolithic IR Surface Emitting Semiconductor Lasers	12.300	University of Texas at Arlington	126060159062		$176,027
Just-in-Time, Single-Dose, Universal Anti-Influenza A Virus Therapeutic	12.420				$250,934
Kinetics Studies of ARO-Relevant Fuels using Shock Tube/Laser Absorption Methods	12.431				$127,298
L2K2R2: Learn to Read to Know, Know to Learn to Read	12.431	University of Southern California	54041521		$60,392
Ladderene-Based Polymechanophores: From Understanding Mechanotransduction to Developing Materials with Amplified Force-Response	12.431				$269,822
Laser propagation in heterogeneous media and applications to off-axis reconstructions	12.300				$111,842
Laser system for precision atom interferometry/Kasevich	12.RD				$206,896
Learning with domain knowledge: an implicit probabilistic models approach	12.300				$22,212
Leverage of Molecular and Macromolecular Architectures for Mechanically Responsive Materials	12.431				$49,746
Low-Density Hyper-Confined Molecular Hybrids: Multifunctional Design and Mechanical Behavior	12.800				$216,429
Machine Learning in Wireless System Design	12.300				$113,345
Macroscopic Properties and Microscopic Interactions in Insect Swarms	12.431				$100,939
Magnet-Free Non-Reciprocal Metamaterials Based on Spatio-Temporal Modulation	12.800	Research Foundation, The City University of New York	CM00001531-00		$391,890
Mathematical Foundations of Secure Computing Clouds	12.800	University of Wisconsin-Madison	580K753		$7,011
Measuring heart rate to assess the stress response in large whales	12.RD				$90,458
Methods for Large-Scale Distributed Decision-Making	12.300				$696
MINER: Multimodal Networks-A General Representational Language Applied to Bio-Medical Hypothesis Generation and Validation	12.RD			$59,098	$121,832
Mode sorting receivers for super-resolution imaging	12.910	University of Arizona	PO 431649		$48,741
Model down-scaling to study flow over abrupt topography: Nesting a new unstructured-grid, isopycnal-coordinate model based on SUNTANS into the hybrid-coordinate HYCOM model	12.300				$186,215
Models and algorithms for higher order network inference	12.431				$78,570
Modular Representations and Coordination for Lifelong Learning	12.910				$257,001
Molecular Control of Optic Nerve Regeneration	12.420	Boston Children's Hospital	GENFD0001395168		$127,169
Molecular imaging of human performance biomarkers at cellular resolution in vivo	12.800				$26,344
Molecular Iodine Based Green Optical Frequency Standard	12.910			$138,448	$359,052
Molecular Mechanisms of Microbial Uptake of Extracellular Electrons	12.300				$106,479
Monitoring the activity of 1 million individual neurons in awake behaving mammals	12.RD				$338,781
MOP: Making Code Obfuscation Practical	12.RD	International Business Machines Corporation	4915012805 / PO 5005105767		$48,467
Multicenter Randomized Trial of Everolimus in Pediatric Heart Transplantation	12.420	Boston Children's Hospital	GENFD0001531682		$38,864
Multicenter Randomized Trial of Everolimus in Pediatric Heart Transplantation - CCC	12.420	Boston Children's Hospital	GENFD0001336034 GENFD0001531886		$198,652
Multifunctional Composite Materials with Built-in Structural Health Monitoring and Energy-storage Capabilities	12.431				$263,828
Multifunctional dielectric metasurface for coding/decoding and sensing of light	12.800				$181,191
Multifunctional Glass for Augmented Reality	12.910	Columbia University	2(GG012649-07)		$109,415
Multi-functional Metafilms for Augmented Reality	12.800				$173,021
Multiscale, group covariant neural networks for learning physics	12.RD	University of Chicago	FP070960-01-PR		$74,909
MURI Center for Dynamic Magneto-Optics (DYNAMO)	12.800	University of Michigan	3003828617		$123,824
Myriad: Automatic Software Diversity for Execution-Time Protection	12.RD	GrammaTech, Inc.	GT S17-01		$54,460
N3 CENTAUR	12.RD	Palo Alto Research Center	P314996		$360,640
Natural language Engagement of Malicious Entities through a Social Interaction Service (NEMESIS)	12.RD	SRI International	PO29225		$102,782
Near-Field Radiative Heat Transfer and Energy Conversion in Nanogaps of Nano- and Meta-Structured Materials	12.431	University of Michigan	SUBK00010159 / PO 3005531165		$28,982
NEPTUNE: Stanford University Hacking for Defense	12.300			$206,019	$1,196,840
Neuromorphics: Programmable analog computation through probabilistic digital communication	12.300			$362,516	$640,817
Next generation near infrared interference coatings with ultra-low stress and losses for deformable mirror applications	12.300	Colorado State University	G-01705-01		$212,334
Noise-resilient Inertial Sensing Using Group II Atom Interferometry	12.300				$290,776
Non-Cardiomyocyte MicroRNAs Mediate Susceptibility to Right Heart Failure	12.420			$30,987	$645,352
Non-reciprocal photonic gauge potential and non-equilibrium thermal metaphotonics for the control of light and heat	12.300				$479,136
Novel Strategies to Combat Post-Traumatic Osteoarthritis (PTOA)	12.420	Palo Alto Veterans Institute for Research	CHU0018-03		$468,084
One- or Two-Laser Yb Optical Atomic Clock	12.300				$170,964
Optical Diagnostics for High Temperature Air	12.800				$50,698
Optimizing Confocal Line-of-sight and Non-Line-of-sight Imaging	12.300	University of Wisconsin-Madison	831K751		$281,173
Optimizing hip, knee and ankle exoskeleton assistance during walking and running at various speeds, grades and loads	12.RD			$173,935	$647,872
Optimizing human neuronal cultures for analysis and model development	12.RD	Lawrence Livermore National Laboratory	B622176		$192,993
Optimizing Range and Velocity Sensing with Computational Single-photon Imaging	12.431				$96,754
Pathogen Classification Tool (PaCT)	12.RD	Stottler Henke Associates, Inc.	PACT_StottlerHenke-Stanford Un		$17,667
PC1.0-011-FP - Manufacturing of Distributed, Flexible and Stretchable Asset Monitoring Networks	12.RD	United Technologies Research Center	PSA 1230799/PO 2605542		$182,717
PCP@Xtreme 4 Predictive Chemistry & Physics at Extreme Temperature and Pressure molecules,crystals and microstructures	12.300	Purdue University	4104-74508		$251,024
PECASE W911NF-12-R-0012-04: Answering High-Level Questions on Low-Level Data	12.431				$84,760

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PECASE: New material and design approaches for integrated nano-optical systems	12.800				$166,858
PECASE: Parity-Time Symmetric Nanophotonic Materials and Metamaterials	12.800				$31,870
Perovskite-Perovskite Tandems for > 25%-Efficient Flexible PV Devices	12.300				$10,134
Photoacoustic Airborne Sonar for Non-Contact Detection Under Water	12.300				$152,186
Photomechanical Material Systems: From Molecules to Devices	12.300	University of Massachusetts Amherst	18-010467 D 00		$193,267
Physical Properties of Materials: Phonon Localization via Defect Engineering in Low-Dimensional Boron Nitride	12.431				$1,140
Physical understanding and predictive modeling of high Reynolds number non-equilibrium turbulent boundary layers	12.300			$28,749	$295,829
Plasma-Based Reconfigurable Photonic Crystals and Metamaterials	12.800			$956,084	$1,443,100
Plasticine: A Universal Data Analytics Accelerator	12.901				$1,167,306
Polymorphism in Layered Materials	12.431				($2,923)
Practical Optimality Guarantees in Estimation and Learning	12.300				$88,300
Precision Measurements of Transverse Transport Coefficients by Torque Magnetometry	12.431			$135,946	$407,657
Preclinical testing of FLASH radiotherapy and immune checkpoint blockade combination therapy in ovarian cancer	12.420				$194,187
Predicting and Understanding Patient Responses to TopoII Isomerase Inhibitors in Breast Cancer	12.420				$83,204
Predicting and Understanding Responses to TopoII inhibitors in Breast Cancer	12.420				$117,493
Preparation of highly vibrationally excited (v greater than or equal to 4) H2 molecules by Stark induced adiabatic Raman passage (SARP))	12.431				$416,985
Preservation and Restoration of Vision In Optic Neuropathies: Porcine traumatic model for advancing neuroprotective and regenerative therapies towards human testing.	12.RD	Medical Technology Enterprise Consortium	MTEC1802OpticNerve0005	$43,841	$302,807
Prevention of Breast Cancer Skeletal Metastases with Parathyroid Hormone	12.RD				$390,535
Prevention of Sediment Recontamination by Improved BMPs to Remove Organic and Metal Contaminants from Stormwater Runoff	12.RD			$80,977	$435,089
Principles of Avian Musculoskeletal Control for Multifunctional Morphing Vehicle	12.800			$89,449	$254,027
Proactive Decision Making for Autonomous Systems: a Formal Methods Approach	12.300				$86,663
Prospective Multicenter Comparative Effectiveness Study of Post-Traumatic Venous Thromboembolism (CLOTT Study)	12.420	National Trauma Institute	NTI-CLOTT17-10		$104,757
Prototype Tunable Graphene Based Infrared Filter	12.RD	SRI International	16204		$19,724
Provable High Confidence Human Robot Interactions	12.300	University of California, Berkeley	00010041 PO BB01193919		$21,061
Proximity Flight in Perturbed Eccentric Orbits using Relative Orbit Elements	12.RD			$49,509	$136,851
Quantum Control of Cold Collisions Using Stark-Induced Adiabatic Raman Passage	12.431				$26,876
Quantum error correction and spacetime geometry	12.800	Tulane University	TUL-SCC-553955		$230,311
Quantum neuromorphic computing and simulation with multimode cavity QED	12.431				$94,426
Quantum Opto-Mechanics with Atoms and Nanostructured Diamond (QOMAND)	12.300	Harvard University	123950-5092630		$17,619
Quantum Simulation of Frustrated Magnets by Rydberg Dressing	12.431				$109,001
Quantum State Control of Molecular Collision Dynamics	12.431	University of Missouri	C00064278-5		$34,650
Quantum-limited sensing	12.300				$558,752
Random Initiation and Reaction Propagation in Energetic Materials	12.800				$103,888
Rapid-Tuning Infrared Laser System	12.800				$139,217
Reaction Networks and Mechanisms: Discovery and Application in Combustion	12.800			$325,980	$453,802
Real-time control of network physical structures to bypass complexity: Optimization, Stochastics and Structure Recognition	12.910	Columbia University	1(GG014413)		$44,640
Recognizing and describing complex human activities from video sequences	12.431	University of Illinois	2015-05174-01		$73,333
Reference models for multi-layer tissue structures	12.420	Cleveland Clinic Foundation	629-SUB 941-SUB		$163,539
Refugee Psychology and Its Potential for Radicalization	12.431	University of Maryland	70428-Z8105201		$1,166
Research Project in Applied Statistics	12.RD				$114,216
Revolutionizing Computing Systems through Dense and Fine-grained Monolithic 3D Integration	12.RD	Massachusetts Institute of Technology	S4632 / PO #216909		$1,727,567
Rewriting the Rules of Thermal Emission via Parametric Microphotonic Design	12.910	University of Southern California	108725131/PO10724755		$69,722
Role of Tgf Beta and Wnt Signaling in Liver Tissue Homeostasis, Tumorigenesis, and Cancer	12.420				$109,482
Rotation of Optically Levitated Microspheres: Techniques for Enhanced Sensitivity Force Sensing	12.300	Yale University	GR102722 CON-80001233		$279,764
RSK3-mAKAP Targeting as a New Therapeutic Strategy for Heart Failure with Preserved Ejection Fraction in Women	12.420				$226,169
SAGE: Synergistic Anticipation of Geopolitical Events	12.RD	University of Southern California	92302638 112813790		$413,172
Scalable Entanglement for Heisenberg-Limited Clocks and Sensors	12.300				$89,798
Scalable Environment for Quantification of Uncertainty and Optimization in Industrial Applications (SEQUOIA)	12.431			$33,360	$251,704
Scalable Memory-Enhanced Ion-Trap Quantum Network (SciNet)	12.431	University of Innsbruck	Prime Award: W911NF-15-2-0060		$315,788
SCAN: Socio-Cultural Attitudinal Networks	12.431	University Of Maryland At College Park	38796-Z8424103		$222,241
Scrutinizing ER Isoform Heterogeneity and Adverse Patient Outcomes in Triple Negative Breast Cancer	12.420				$27,002
Selective AAK1 and GAK inhibitors for combating Dengue and other emerging viral infections	12.420			$121,935	$445,573
Semantic Information Pursuit for Multimodal Data Analysis	12.431	The Johns Hopkins University	2003514594		$242,452
Sensitizing Reaction Chemistry in Detonation	12.800				$206,820
Shock Tube Diagnostics and Performance Improvements	12.431				$172,710

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Shock wave energy dissipation (SWED) by mechanochemically-active nanoporous materials	12.300	University of Illinois	2012-02341-02 (A0442)		$83,729
Shock-Tube Study of Energy Transfer Processes in High-Enthalpy Air	12.800	University of Michigan	3004167517		$197,518
Si Compatible Electrically Pumped Direct Bandgap Ge/GeSn Laser	12.800				$59,077
Single Sheet Lasers for Attojoule Optoelectronics	12.800	University of Texas at Arlington	26020149062		$6,688
Solving Complex Tasks with Team-Based Crowdsourcing	12.300				$221,469
Southern California Cetacean Behavioral Response Study	12.RD	Cascadia Research	Subcontract 467-Stanford		($37)
Space surveillance with correlation based radar	12.800				$145,858
Spectroscopic Imaging of Defects Using Radiation-Actuated Scanning Electron Microscopy	12.800				$6,968
Spectroscopic Measurements and Nonequilibrium Modeling for High-Enthalpy Air	12.800	California Institute of Technology	S437969		$12,946
Spin squeezing for precision inertial sensing	12.300				$6,951
Split Chip Design for Obfuscation and IC Trust	12.910	Carnegie Mellon University	1150166-395566		$183,532
Statistical Tools for Reproducible Selections	12.300				$86,098
STELLAR (Super Turing Evolving Lifelong Learning ARchitecture)	12.RD	HRL Laboratories, LLC	17038-182019-QS		$82,060
Strengthening and Armoring of Sheared Granular Beds	12.431	Yale University	GK0000625(CON-80000153)		$67,045
Stretchable Polymer Semiconductors	12.800				$218,603
Sub-Hinze scale breakup model for high-fidelity simulation of bubbly flows	12.300				$23,633
Supermaneuverable Autonomous Pursuit: Peregrine Falcon Versus Pigeon Inspired UAVs	12.800			$136,200	$416,615
Supplemental Realignment Proposal for SR-01: FDA IND-Enabling Studies and Recruitment of Clinical Trial Sites	12.420	Wake Forest University	WFUHS 441011 SR-01		$190,947
Surface Plasmon Resonance Instrument for Rapid Development of gold labeled Single-chain variable fragments for use in Structural Determination of Transcription related proteins	12.431				($5,194)
Surfaces, Particles, and Structured Liquids - Ultrafast Nonlinear Experiments	12.800				$155,750
Synthesis and Assembly of xDNA: Toward Unnatural DNA Nanostructures	12.431				$22,032
Synthesis and Development of High-Energy Molecular Ladder Scaffolds	12.RD				$200,316
Synthesis Planning and Reaction Discovery For Photochemistry and Chemistry in Novel Environments	12.300			$190,776	$946,449
Systems for Development of Hybrid Microwave-Optical Quantum Networks	12.800				($86)
TA2, 1000 Molecules	12.RD	Massachusetts Institute of Technology	S4598/PO #178124 S4566/Subaward PO # 155650	$92,212	$208,696
Targeting BMPR2 Signaling to improve Right Ventricular Function in Congenital Heart Disease	12.420				$518,809
Targeting Metastatic Breast Cancer with Copper Trap Assembled in Situ	12.420				$131,557
Targeting Toll-Like Receptor Signaling for Prevention and Treatment of Breast Cancer	12.420				$1,648
TBI Endpoints Development (TED)	12.420	University of California, San Francisco	8595sc/1169622-100-EHAWX 8595sc- 5		$41,281
The Attojoule Challenge in Photonics/Optoelectronics: Materials, Devices, Modeling and Architectures	12.431				$8,379
The Broad Band Receiver (BBR) Instrument on the Demonstrations and Science Experiments (DSX) Spacecraft	12.RD				$338,991
The Neuronal Roles of Mitofilin, a Housekeeper for Mitochondrial Crista Architecture	12.420				$497,438
The Role of Hypoxia in the Tumor Microenvironment: Implications for Ovarian Cancer Therapy	12.420				$230,199
The role of mesoscale strain in the near-surface decay and propagation of high-mode near-inertial wave energy	12.300				$59,975
The Role of Nemolike Kinase in the Pathogenesis and Treatment of Diamond Blackfan Anemia	12.420				$14,591
The Search and Theoretical Guidance for Higher Tc Superconducting Materials	12.800			$110,899	$433,264
Thermochemical Transformations Using Entropy-Stabilized Oxides	12.300				$154,115
Three-Dimensional Separated Flow over a Bump: Sensitivity to Geometric and Boundary Condition Variations	12.300				($3,139)
Top-Down And Bottom-Up Brain Mechanisms At Multiple Spatial And Temporal Scales: Experimental Investigation And Computational Modeling	12.300			$1,059,448	$1,507,767
Topics II.A.2.a and II.A.2.c: Photonic and Phononic Technologies for Superconducting Quantum Information Systems	12.431	California Institute of Technology	S387326		$413,188
Tourniquet Master Training System for Junctional and Inguinal Hemorrhage Control Devices (TMT)	12.RD	Charles River Analytics Inc.	SC1701903		$230,043
Toward Quasi-Ballistic Transport in 2D Transistors	12.800				$148,867
Toward Scalable Quantum Photonic Engineering with OPO Networks	12.431	California Institute of Technology	S398444		$41,300
Tracking, Diagnosing and Arresting Dielectric Breakdown Using Multiscale Characterization and Simulations	12.300	University of Connecticut	PO# 163166/KFS# 5641050		$238,714
Translating a stem cell-based therapy for epidermolysis bullosa into the clinic	12.420	University of Colorado Denver	FY19.489.001		$234,398
Transplantation of Photoreceptors for Restoration of Sight	12.420				$451,548
Trop2 as a novel driver and therapeutic target for castration-resistant prostate cancer	12.RD				$232,939
Tunable electromagnetic surfaces using hybrid semiconductor-plasmonic optoelectronics	12.300				$102,109
Tuning Metal-Insulator Transitions in Ultra-Thin Correlated Materials	12.800				$153,324
Ultrafast 2D IR Pulse Shaping Spectrometer for Tracking, Diagnosing and Impeding Dielectric Breakdown in Polymers	12.300				$370,306
Ultralow power, Ultrafast, Integrated Nano-Optoelectronics	12.800	University of Texas at Austin	UTA16-001253		$944,199
Uncovering Complex Reaction Networks from First Principles	12.300				$112,103
Understanding Air-film Breakup under Liquid impacts using Direct Numerical Simulations	12.300				$7,322

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Understanding PAH Clustering Facilitated by Metal Cations at High Temperatures	12.800	University of Utah	10052440-S1// PO U000197139		$73,748
Understanding Scenes and Events through Joint Parsing, Cognitive Reasoning and Lifelong Learning	12.300	University of California, Los Angeles	1015 G TA275		$189,530
Unifying Weak Supervision Methods and the Fundamentals of Matrix-vector Multiply	12.300				$233,955
United States-Japan Polymer Symposium: "Macromolecules: Challenges and Opportunities for the 21st Century"	12.431				$10,000
Unmanned Aircraft Collision Avoidance: Coordination Strategies and Policy Verification	12.RD	MIT-Lincoln Laboratory (DOD)	7000335010		$4,633
Upscale: Scaling up formal tools for POSH Open Source Hardware	12.901			$343,759	$1,039,546
UV AND IR LASER SYSTEMS FOR SPECTRALLY-RESOLVED REACTING FLOW DIAGNOSTICS	12.800				$3,978
UV Laser System	12.800				($18,540)
Variational Methods for Information Processing and Learning	12.800				$15,958
Verified Application Debloating and Delayering	12.RD	Galois, Inc.	2017-010		$127,480
Visual common sense reasoning for multi-agent activity prediction and recognition	12.300	University Of Maryland At College Park	Z8995002		$90,280
W911NF-12-R-0011-04: Towards a process-based understanding of sediment degassing and ramifications for the mechanical stability of permafrost, Earth Material and Processes	12.431				$64,173
W911NF-12-R-0012-03: Deciphering the flow-to-fracture transition in frictional fluids	12.431				$11,413
Wall-modeled LES for high-speed transitional boundary layers interacting with incident shock waves	12.800				$426,099
Warfighter protection against blast / ballistic / directed energy threats via lightweight, wearable, reconfigurable colloidal gels	12.300				$473,012
What if we could electrically tune properties of strongly-correlated materials just like we can with semiconductors?	12.800			$103,808	$364,535
XASEM for Surface Chemical Imaging Approaching Atomic-Scale Precision	12.300				$8,258
XRL: Explainable Reinforcement Learning for AI Autonomy	12.910	Carnegie Mellon University	1150156-381054		$20,261
Yeast Surface Display Approaches for Engineering Stabilized Viral Fusion Protein Subunit Vaccines	12.420				$8,799
YIP2015: Phase Change and van der Waals Engineering in Two-Dimensional Materials	12.300				$117,411
Department of Education					**$1,319,906**
A behavioral intervention to increase degree attainment among near completers	84.305	University of Virginia	GM10155 PO#2108287 GM10155-150690		$56,950
A Scalable Growth Mindset Intervention to Raise Achievement and Persistence in Community College	84.305A				$692,683
Beyond Triage: A Randomized Experiment in Sustained Pre-College Advising	84.305E			$36,634	$63,250
Developing and Testing Multi-Component Computer-Based Assessment Tasks for the Next Generation Science Standards	84.305	University of California, Berkeley	00009173/PO BB00774256		$66,752
Fostering Reliance on Visuospatial Representations to Enhance High School Students¿ Success in Pre-Calculus Trigonometry	84.305A				$144,272
IES Post doc Training	84.305B				$100,898
Investing in Innovation Fund (i3), CFDA 84.396B	84.396B	New Schools for New Orleans	SPO# 121617		($27,804)
National Resource Center - Center for Latin American Studies	84.015A				$62,942
National Resource Centers Program and Foreign Language and Area Studies Program	i4.015A and 84.015I				$17,080
NATIONAL RESOURCE CENTERS PROGRAM CFDA NO. 84.015A & FOREIGN LANGUAGE AND AREA STUDIES FELLOWSHIPS PROGRAM CFDA No. 84.015B	i4.015A and 84.015I				$14,144
Stanford World Language Project ESSA 2018-2019	84.367A	University of California Office of the President	ESSA18-CWLP-STANFORD		$128,739
Department of Energy (DOE)					**$20,330,097**
A Field Study of the Stimulated Reservoir Volume, Detailed Fracture Characteristics, and EOR Potential in the Eagle Ford Shale Formation.	81.089	Texas A & M University	M1802544		$104,533
A Multi-Model, Multi-Scale Research Program in Stressors, Responses, and Coupled Systems Dynamics at the Energy-Water-Land Nexus	81.049			$1,172,476	$1,668,077
A Renewal Proposal to Investigate the Roughness and Advance Rate of the Weathering Interface	81.049	The Pennsylvania State University	5715-SU-DOE-5675		$22,510
A SYSTEMS BIOLOGY APPROACH TO MICROBIAL SYMBIOSES	81.RD	Lawrence Livermore National Laboratory	B612106		$64,133
Accelerated Scaling to Rapid Open-Air Fabrication of Durable Perovskite Solar Modules	81.087				$320,428
An Unsolicited Request by the Energy Modeling Forum for Funding to the Department of Energy Energy Information Administration	81.036				$210,924
Assimilation of Multiscale Data into Multifidelity Biogeochemical Models	81.049			$42,062	$154,419
Bridging Scales in Geomechanics: Fluid Flow, Solid Deformation, and Microstructure Characterization	81.049				$184,127
Center for Mechanistic Control of Water-Hydrocarbon-Rock Interactions in Unconventional and Tight Oil Formations	81.049			$336,677	$1,328,459
Center for Nanoscale Control of Geologic CO2 (NCGC)	81.RD	Lawrence Berkeley Laboratories, University of California	SUBK: 7219153		$24,976
Chemical Kinetic Modeling Development and Validation Experiments for Direct Fired sCO2 Combustor	81.089	University of Central Florida	16266143-Stanford		$19,520
Climate Specific EVA Adhesion Degradation Model	81.RD	National Renewable Energy Laboratory	UGA-0-41028-07		($3,345)
Conformational and Chemical Dynamics of Single Proteins in Solution by Suppression of Brownian Motion	81.049				$256,697
DARK MATTER SEARCH EXPERIMENTS: SuperCDMS Soudan and SuperCDMS SNOLAB	81.049				$330,880
Data Driven Approach to Dislocation-Based Plasticity Models of Face-Centered Cubic Metals	81.049				$215,052
Defining the Minimal Set of Microbial Genes Required for Valorization of Lignin Biomass	81.049				$176,621

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Develop Analytical Performance Models for Multiple-N3XT Systems and Develop Compact Thermal Models for Memory Technologies on Si CMOS	81.RD	Brookhaven National Laboratory	360329		$41,820
Development and Implementation of Eulerian Strength Model for Multi-Material Elastic-Plastic Flow	81.RD	Lawrence Livermore National Laboratory	B612155 B625957		$75,116
Development of a molecularly informed biogeochemical framework for reactive transport modeling of subsurface carbon inventories, transformations and fluxes	81.049			$61,299	$80,272
Development of Approaches to Model Excited State Charge and Energy Transfer in Solution	81.049	University of California, Merced	E252GTA350		$117,628
DOE-Cyclotron Road Project	81.117	Activation Energy Inc	DE-EE0008239-S-SGPC-001		$7,436
Does mycorrhizal symbiosis determine the climate niche for Populus as a bioenergy feedstock?	81.049				$179,209
ECP - Enhancing and Hardening the Legion Programming System	81.RD	Triad National Security, LLC	Sub No. 436263		$284,316
EGS Collab SIGMA-V	81.000	Lawrence Berkeley Laboratories, University of California	7352162		$90,220
Enabling Catalytic Strategies for Biomass Conversion	81.049				($29)
Experiment Study of Neutrino Properties: EXO-200 and nEXO	81.049				$649,334
Experimental Challenges in Probing Dark Energy through Weak Lensing with the Large Synoptic Survey Telescope	81.049				$75,107
Experiments and Simulations of Hypervelocity Impact Plasmas	81.049				$4,362
Fast and Robust Hierarchical Matrix Solvers	81.RD	Sandia National Laboratories	1759540 - Master 918800		$87,978
Frontiers in Quantum Metrology and Transduction	81.049				$1,005,987
Fundamental aspects of Spacetime and Quantum Fields	81.049				$160,602
Fundamental physics of hypersonic laminar-turbulent transition	81.RD	Sandia National Laboratories	PO 1987733 // Master 1918121		$129,765
High Efficiency Wafer-Scale Thermionic Energy Converters	81.135			$339,971	$340,892
High-Pressure Shock Tube Ignition Delay Time Experiments	81.049	Combustion Science & Engineering Inc	139501		$22,630
Hydrodynamics Adaptive Mesh Refinement Solver (HAMeRS)	81.RD	Los Alamos National Laboratories, University of California	431679		$26,825
Legion Applications	81.RD	Triad National Security, LLC	502266		$73,864
Light-Material Interactions in Energy Conversion	81.049	California Institute of Technology	S390426 (67N1095803)		$54,160
Light-matter interaction in nanoscale systems for energy applications	81.049				$297,716
Low-Cost High-Reliability Thermoelectrics for Waste Heat Conversion	81.RD	Lawrence Berkeley Laboratories, University of California	7466483		$27,036
Low-Cost Scaffold-Reinforced Perovskite Solar Modules with Integrated Light Management	81.087				($18,217)
Matter in Extreme Conditions hutch at the Linac Coherent Light Source	81.RD	Triad National Security, LLC	519399		$32,385
Mechanical Behavior of Hybrids with Hyper-Connected Molecular Networks	81.049				$163,829
Mesoporous Materials: Dynamics, Structure, Interactions, and Processes	81.049				$362,385
Metabolic Constraints of Organic Matter Mineralization and Metal Cycling During Flood Plain Evolution	81.049			$61,130	$145,748
Models for Scale Up of flow through electrode capacitive deionization (FTE-CD) systems	81.RD	Lawrence Livermore National Laboratory	B625932		$99,842
Modular Microbial Electromethanogenesis Flow Reactor for Biogas Upgrading eXCHANGE Control Number: L045-1517	81.RD	Lawrence Livermore National Laboratory	B631127		$125,756
Modular Microbial Electrosynthesis Flow Reactor	81.RD	Lawrence Livermore National Laboratory	B627559		$22,958
Multiscale dynamics of reactive fronts in the subsurface	81.049				$217,443
Nanosystems for Highly Energy-Efficient High-Performance Computing	81.RD	UT-Battelle LLC	4000158611		$127,246
Natural gas leakage simulation collaboration	81.RD	Sandia National Laboratories	PO# 1738103		$500
New Searches for Ultralight Particles	81.049				$120,189
nEXO large area SiPM readout test tile	81.RD	Lawrence Livermore National Laboratory	B631872		$70,512
Novel chalcopyrites for advanced photoelectrochemical water-splitting	81.087	University of Nevada, Las Vegas	GR06925/DE-EE0008085		$31,566
Novel materials for renewable energy	81.049				$125,372
Open and Scalable Distributed Energy Resource Networks	81.135			$210,412	$965,035
Perovskite on Silicon Tandem Solar Cells	81.087			$135,183	$455,216
PhILMs: Collaboratory on Mathematics and Physics-Informed Learning Machines for Multiscale and Multiphysics Problems	81.049				$202,216
Photonic Structure Textiles for Localized Thermal Management	81.135				($1,457)
Photonics at Thermodynamic Limits	81.049			$604,192	$1,812,380
Predictive Analytics for Natural Gas Leak Detection and Mitigation	81.RD	National Renewable Energy Laboratory	UGA-0-41028-08		$64,292
Predictive Simulations of Particle-laden Turbulence in a Radiation Environment	81.124			$273,860	$2,993,428
Preparation, deployment and analysis of data from a dual-phase xenon detector deployed at a neutron beam.	81.RD	Lawrence Livermore National Laboratory	B630477		$20,348
Probing Strong-field Effects in QED on FACET-II	81.049				$2,295
Protective catalyst systems on III-V and Si-based Semiconductors for Efficient, Durable Photoelectrochemical Water Splitting Devices	81.087				$235,349
Research in Integrated Assessment Inter-Model Development, Testing and Diagnostics	81.049				$37,228
ReSource: Utilizing CO2 for Commodity Polymer Synthesis	81.135				$389,598
RESPONSE OF SUBSURFACE NITROGEN-CYCLING MICROBIAL COMMUNITIES TO ENVIRONMENTAL FLUCTUATIONS	81.049				$48,401
Selective Catalytic Oxidations: Opportunities and Challenges for Selective Conversion of Renewable Resources	81.049				$221,924
Spin Functionality Through Complex Oxide Heteroepitaxy	81.049				$149,859
Stochastic models of chemistry revealed by statistical learning methods	81.112	Washington State University	21238_G003697		$197,665
Studies of Surface Reaction Mechanisms in Atomic Layer Deposition	81.049				$117,664
SynPLASTome 2.0: Synthetic Plastid Genome to Reprogram Chloroplast Function for the Production of Fuels and Chemicals	81.135	University of Tennessee	9500072841		$182,794

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The Center for Enhanced Nanofluidic Transport (CENT)	81.049	Massachusetts Institute of Technology	S4687 - PO 242245		$121,197
The Geometry and Flow of Quantum Information: From Quantum Gravity to Quantum Technology	81.049	University of California, Berkeley	00010057; DE-SC0019380		$45,605
Thermal flow testing for SIGMA-V	81.000	Lawrence Berkeley Laboratories, University of California	7348695		$55,431
Thermal Switch Materials for Building Envelopes: A New Paradigm for Spatial and Tem-poral Optimization of Building Thermal Energy	81.000	Lawrence Berkeley Laboratories, University of California	7465477		$11,705
Thermal Transport Modeling and Qualification of Strength in Metal Additive Manufacturing Processes	81.RD	Sandia National Laboratories	PO 2058646 // Master 1918121 PO 1801759, // Master 918800		$137,770
Thermoacoustic Root Imaging, Biomass Analysis, and Characterization	81.135			$34,591	$556,591
Transient kinetic testing of entropy stabilized oxides	81.RD	Battelle Energy Alliance, LLC (BEA)	Contract 192131		$74,966
Tuning Organic Semiconductor Packing and Morphology through Non-equilibrium Solution Processing	81.049				$190,819
Ultra-High Speed Neutral Plasma Jets and their Interactions with Materials Generating Extreme Conditions	81.112			$21,779	($16,372)
Uncertainty estimation for BHR predictions of variable density flows	81.RD	Triad National Security, LLC	536415		$47,862
Using Systems Approaches to Improve Photosynthesis and Water Use Efficiency in Sorghum	81.049	Donald Danforth Plant Science Center	23207-S		$237,125
Variable Property Mixing in Transitional and Turbulent Regimes	81.RD	Los Alamos National Laboratories, University of California	518570		$51,044
Wearable Electroactive Textile for Physiology-Based Thermoregulation	81.135	SRI International	119-000278		$3,870
Wide Bandgap Chalcopyrite Photoelectrodes for Direct Solar Water Splitting	81.087	University of Hawaii	GR06642		$180,478
Department of Health and Human Services (DHHS)					**$546,239,920**
"NIH StrokeNet National Coordinating Center" - Administrative Consulting Agreement - Albers	93.853	University of Cincinnati	NS086872/011414-Adm-Albers		$7,733
"Peripheral mechanisms of homeostasis and tolerance through skin dendritic cells.	93.846	Brigham and Women's Hospital	115698		($3)
"Prospective evaluation of a surgical solution for breast cancer-associated lymphedema".	93.394	Fibralign Corporation	R44CA203608-Stanford		$246,530
(#6) A novel animal model for determining the role of circadian timing in breast cancer development	93.396				$199,660
(PQ1) Identifying and targeting human glioblastoma migrating in the peritumoral niche	93.393				$286,358
(PQ4) Quantitative and multiplexed analysis of gene function in cancer in vivo	93.396				$416,992
(PQ7)Multi-scale Analysis of Tumor Microenvironment Heterogeneity	93.396				$636,300
(PQD2)New Biomarkers and Pathways to Enhance Cure in Ovarian Cancers	93.394				$20,762
1/2 Genomic Strategies to Identify High-Impact Psychiatric Risk Variants	93.242	University of California, Los Angeles	2000 G SG 173		$1,956
2/2-Mechanism of Antidepressant-Related Dysfunctional Arousal in High-Risk Youth	93.242			($254)	$546,489
24/7 Closed Loop Insulin Delivery in Older Subjects with Type 1 Diabetes	93.853	University of Cambridge	RG84379; DAN06		$19,508
3 D Electron Microscopy of Macromolecules	93.859			$95,100	$1,619,027
3D Dynamic Contrast-Enhanced US for Monitoring Chemotherapy of Liver Metastasis	93.394				$132,878
3D Passive Cavitation Imaging-Guided Therapeutic Delivery of MicroRNA into Cancer	93.286				$77,384
3D Structure and mechanism of the alpha7 nicotinic acetylcholine receptor	93.853	University of Texas Southwestern Medical Center Dallas	GMO180301 / PO RGC0000001443		$9,632
4/7 Psychiatric Genomics Consortium: Finding actionable variation	93.242	University of California, San Diego	78717548 / PO# S9001508		$19,987
5'UTR RNA Regulons in ribosome-mediated control of embryonic development	93.865				$469,738
A "Circuits-First" Platform for Personalized Neurostimulation Treatment	93.242				$918,809
A "Culture" Shift: Integrated Bacterial Screening and Antibacterial Susceptibility Test on Microfluidic Digital Array for Bloodstream Infections	93.855	The Johns Hopkins University	2003726059		$281,121
A 5 minute motion-corrected pediatric brain MRI protocol	93.865				$57,165
A Biobehavioral Research Training Program	93.242				$282,864
A Bioorthogonal Approach to Study Mammalian Aging	93.310				$819,649
A Brain Circuit Program for Understanding the Sensorimotor Basis of Behavior	93.853	University Of Washington	UWSC10311; BPO 40343 1028077-719-EAFGS		$61,718
A chemical biology approach towards understanding the anti-cancer innate immunity	93.396				$36,631
A Clinical Center to Study Immunological and Hormonal Biomarkers for the Diagnosis, Prediction and Treatment of Chronic Pancreatitis and its associated development to Diabetes and Pancreas Cancer	93.847				$488,841
A clone's genomic stability as biomarker of its DNA-damage resilience	93.398				$81,477
A complete map of the top 100 molecules from the gut microbiome	93.310				$939,137
A Critical Role for Leukotriene B4 in Lymphedema	93.837	Palo Alto Veterans Institute for Research	NIM0013-02 NIM0013-01		$60,306
A Dashboard of Racial/Ethnic Disparity in Care Provided by NICUs	93.865			$197,842	$585,787
A Data Coordinating Center for ENCODE	93.172				$5,681,169
A Discovery Engine For Reproducible and Comparable Multi-Omic Analysis	93.859			$77,351	$228,845
A Droplet-Based Single Cell Platform Identification and AST	93.855	The Johns Hopkins University	2002692528		$177,422
A Facebook Intervention for Young Sexual and Gender Minority Smokers	93.307	University of California, San Francisco	10346sc		$3,449
A Gene-Complete Computational Model of Yeast	93.310				($4,060)

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A Genomic Framework for Molecular Risk Prediction & Individualized Lymphoma Therapy	93.394				$41,779
A High-Throughput Platform for Crystallography-Based Fragment Screening	93.859	Accelero Biostructures Inc	1001-002 (SPO 132559)		$88,725
A low blood volume platform for global newborn screening of common, treatable conditions	93.865	Baebies, Inc.	1R44HD096981-01		$17,556
A mitochondrial membrane-spanning ternary complex regulates mitochondrial motility	93.866				$100,517
A molecular signaling pathway underlying differential predisposition of ApoE4 genotype to Alzheimer's disease	93.866				$102,935
A monkey model of naturally occurring social impairments	93.865			$215,038	$378,869
A Multicenter Study of EEG in Premature Infants with Neonatal Encephalopathy	93.853				$192,144
A Nanoscale Plasmonic-Gold Platform for Specific Diagnosis of Zika and Differentiation from other Flavivirus Infections	93.855	Nirmidas Biotech, Inc.	128588		$76,664
A new class of CSF-1R radioligands for monitoring glioblastoma progression and therapy	93.394				$92,239
A New Direction to Achieve Ultra-Fast Timing for Positron Emission Tomography	93.286				$495,893
A NEW FRAMEWORK FOR UNDERSTANDING THE MECHANISMS OF DIASTOLIC DYSFUNCTION	93.837	Palo Alto Veterans Institute for Research	ENN0001-01 ENN0001-02		$392,920
A New Paradigm for Hypertension in the Elderly- Beyond Age	93.866	Northern California Institute for Research and Education	PER1868-02		$116,382
A new strategy for cell-type specific gene disruption in flies and mice	93.242			($212)	$47,554
A Noninvasive Integrated Genomic Approach for Early Cancer Detection and Risk Stratification after Transplantation	93.394				$400,639
A Novel Chimeric Antigen Receptor T-cell Targeting B7-H3 for the Treatment of Osteosarcoma and Ewing Sarcoma	93.397	Sarcoma Alliance for Research through Collaboration	SPORE-Y5-CDP-1-STANFORD-MAJZNE		$37,908
A Novel Cognitive Reappraisal Intervention for Suicide Prevention	93.242	Cornell University	184208-2		$44,010
A Novel Neuromonitoring Guided Cognitive Intervention for Targeted Enhancement of Working Memory	93.242				$182,777
A Novel Oral Therapeutic for Hepatocellular Carcinoma	93.395	Eiger Group International Inc	121718		$4,407
A Novel Platform for Synthesis of Programmable Proteome-Scale Peptide Bead Arrays	93.859	University of California, San Francisco	10080sc		$264,518
A Novel Positron Emission Tomography Strategy for Early Detection and Treatment Monitoring of Graft-versus-host Disease	93.394				$420,729
A Novel Prdm14-containing Protein Complex Regulates Chromatin in Stem Cells, Development, and Cancer	93.398				$7,903
A novel RNA-guided platform for sequence-specific cell reprogramming	93.310				$362
A phase 1/2 study of nivolumab (IND# 124729) in children, adolescents, and young adults with recurrent or refractory solid tumors as a single agent and in combination with ipilimumab	93.RD	Children's Hospital of Philadelphia	PO 9500060716-05C/FP00013560		$15,000
A Phase II Trial of MK-3475 (pembrolizumab) and Interferon Gamma 1-b Combination Immunotherapy in Patients with Previously Treated MF/SS	93.353	The Fred Hutchinson Cancer Research Center	916861		($757)
A Population-based Study of SLE Pregnancy: Risks and Outcomes in Mother and Child	93.846				$102,726
A Quantitative Multiplexed Platform for the Pharmacogenomic Analysis of Lung Cancer	93.395				$549,135
A Randomized Controlled Trial of a Group-Based Therapeutic Yoga Intervention for Urinary Incontinence in Ambulatory Older Women	93.847	University of California, San Francisco	11117sc		$151,559
A Randomized, Double-Blind, Placebo Controlled Pilot Trial of Oral Salsalate in the Treatment of the Subset of Unexplained Anemia in Elderly Patients with Elevated Interleukin-6 (PACTTE)	93.866	Duke University	2038378		$38,236
A Sleep-Oriented Intervention for Suicidal Behaviors	93.242				$2,337
A Stanford - SJSU Postdoctoral Training Program to Enhance URM Teaching	93.859				($5,324)
A Synchrotron Radiation Structural Biology Resource	93.859			$52,927	$4,310,846
A Systems Biology Approach to Study Cardiac Arrhythmias: iPS Cells and In Silico Modeling	93.837			$126,201	$350,580
A technique for measuring eye movements in small and/or freely moving animals	93.867				$10,735
A Toolkit of Peptide-Drug Conjugates for Targeted Delivery to Brain Tumors	93.397	Massachusetts Institute of Technology	101639		($194)
A versatile system for cell-specific control of gene expression in the fly brain	93.853			($5,355)	($5,355)
A Wireless, Implantable Microdevice for Closed-Loop Drug Delivery to Prevent the Morbidity of Diabetes Therapy-Induced Hypoglycemia	93.286				$635,055
a-Catenin/F-actin Structure at Cell-Cell Junctions	93.859	Sanford Burnham Medical Research Institute	60019-12914-SU		$218,665
Accelerated dissociation of IgE receptor complexes	93.855				$443,973
Accelerating drug development and repurposing using systematic genetic interaction maps in mammalian cells	93.865				$384,403
Accelerating Solutions to Optimize Glycemic Control and Weight Management In Young Adults with Type 1 Diabetes	93.847	The University of North Carolina at Chapel Hill	5107491 5107491-2		$91,487
Accessing the Neuronal Scale: Designing the Next Generation of Compact Ultra High Field MRI Technology for Order-of-Magnitude Sensitivity Increase in Non-Invasive Human Brain Mapping	93.286				$215,891
Accuracy and integration of large scale data from genome sequencing and mobile sensors	93.RD				$312,415
ACE Collaborative Projects	93.855	University of California, San Francisco	9439sc		$125,310
ACE: Autoimmunity Center of Excellence (ACE) at Stanford.	93.855				$242,959
Actin-Based Motility of a Bacterial Pathogen	93.855				$7,684
Activation of Cardiac FGFR4 Causes Left Ventricular Hypertrophy	93.837	University Of Alabama In Birmingham	OSP# 000516856		$26,788
Active surveillance and patient reported outcomes in a diverse population of prostate cancer patients	93.393	University of California, San Francisco	10349sc		$136,209
Activity-dependent Synaptic and Circuit Plasticity	93.242				$2,245,780
Acute/chronic limitations to transcriptional RNAi therapies for infectious and other liver diseases	93.855				$549,512
AD/ADRD Supplement to CNS Deficits: Interaction of Age and Alcoholism	93.273	SRI International	157-000010		$133,118

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Addressing Health Literacy and Numeracy to Prevent Childhood Obesity	93.865	Vanderbilt University Medical Center	VUMC39135		$24,326
Adipocytes are Important Players in the Acute Lymphoblastic Leukemia Microenvironment	93.396	University of California, Los Angeles	1645 G VA145		$63,715
Administrative Supplement to R01AG21055 Clinical, Imaging, and Pathological Studies in the Oldest Old: The 90+ Study	93.866	University of California, Irvine	2019-3722		$25,851
Adult and Pediatric Nephrology and Urology Research Training Program	93.847				$245,837
Advanced MR and CT Imaging for Understanding Acute Stroke Evolution and Predicting Response to Recanalization Therapy	93.286				$178,906
Advanced MR Imaging of Early Osteoarthritis	93.846				$161,844
Advanced neural decoders for the restoration of communication	93.173			$132,037	$571,472
Advancing a broad-spectrum anti-influenza A virus RNA packaging inhibitor to an IND	93.855				$1,332,439
Advancing a Novel Potent Zika Virus Specific Nucleoside Analog to the Clinic	93.855	Riboscience LLC	1 R44 AI129024-01A1 SPO132442		$50,775
Advancing Broad Spectrum Host-Targeting Antiviral Strategies to the Clinic	93.855			$291,785	$3,176,930
Advancing Science & Policy in the Retail Environment (ASPiRE)	93.393	The University of North Carolina at Chapel Hill	5112337		$465,611
ADVL1412: PER CASE REIMBURSEMENT and PATIENT STUDIES FUNDS: NIH COG Phase 1 Grant (UM1CA097452)	93.395	Children's Hospital of Philadelphia	FP13560_SUB79_01		$1,645
Age induced enteric neural stem cell loss through Foxo3 dependent inflammation	93.847				$241,655
Age-related Changes in Human Retinal Microvasculature	93.867	Icahn School of Medicine at Mount Sinai	0255-3021-4609		$60,244
Age-related decline in interactions between context, cognitive control, and memory	93.866				$81,010
AIBP Mediates A NOVEL Interplay between cholesterol and Lymphangiogenesis	93.837	Houston Methodist Research Institute	15460004-139		$136,229
Alcohol disrupts the balance between dopamine and GABA co-released by midbrain dopamine neurons	93.273				$341,683
Alcohol-related sleep disturbances and circuit dynamics of arousal neuropeptides	93.273				$183,198
ALDH Activation to treat Fanconi Anemia	93.837				$632,440
Algorithms and Software for Provably Accurate De Novo RNA-Seq Assembly	93.172	California Institute of Technology	1168421-1-DJYCA S381159		$109,687
Aligned Nanofibrillar Scaffolds Enhance Angiogenesis and Viability in Ischemia	93.837			$62,500	$560,659
Allosteric modulation of the mu-opioid receptor	93.279	University of Michigan	Subaward # 3003633137		$95,610
Alzheimer's Clinical Trials Consortium (ACTC)	93.866	University of Southern California	111180852; PO 50767790		$6,544
Alzheimer's Clinical Trials Consortium (ACTC) (U24)	93.866	University of Southern California	105761496; PO 50796629		$15,793
Alzheimer's Disease Genetic Consortium	93.866	University Of Pennsylvania	573992; PO# 4038588		$6,873
American Heart Association Tobacco Center for Regulatory Science (A-TRAC) 2.0	93.837	American Heart Association	FX-ATRAC-2U54HL120163-SU-06		$25,014
American Initiative in Mast Cell Diseases (AIM)	93.350				$15,000
AMP RA/SLE Leadership Center	93.846			$713,933	$1,071,016
Amygdala mechanisms of pain aversion	93.853				$315,465
An 18F PET/NIRF Smart Probe for Identifying, Grading, and Visualizing Astrocytic Gliomas	93.398				$52,907
An enzymatic approach to study cancer-associated cell-surface glycoproteins: exploration of mucin-degrading bacterial metalloproteases	93.859				$60,677
An Essential Role for MiR-29b in the Protective Effect of Apelin in Diabetic Vascular Stiffness	93.837				$8,863
An integrated pipeline for accelerated plant natural product discovery	93.859			$373,710	$987,618
An interneuron-based cell therapy for epilepsy	93.853	University of California, San Francisco	9744sc		($2,876)
An open-label, multi-centre, randomised, single-period, parallel study to assess the efficacy, safety and utility of 12 month day-and-night automated closed-loop insulin delivery under free living conditions compared to conventional insulin pump therapy in children and adolescents with type 1 diabetes.	93.847	Jaeb Center for Health Research	DAN05-Hood		$64,831
Analysis of Nocardia Assembly-Line Polyketide Synthases and Their Role in Nocardiosis	93.859				$56,736
Anastrozole in Pulmonary Arterial Hypertension: AIPH2	93.837	University Of Pennsylvania	575951 / R01-HL134905		$34,894
Anchored Phosphatase and Transcription Factor Regulation in the Heart	93.837	University of Connecticut	UCHC7-98175577	$59,034	$166,420
Anesthesia Training Grant in Biomedical Research	93.859				$291,836
Angiogenic Tissue Engineering to Limit Post-Infarction Ventricular Remodeling	93.837				$4,014
Animal 7T MRI Scanner for Imaging Neural Circuits	93.351				$1,999,992
Annual Symposium of the AHA Basic Cardiovascular Sciences Council, 2018 Scientific Sessions: Pathways to Cardiovascular Therapeutics	93.837				$30,000
Antecedent Medical Conditions and Medications: Associations with the Risk and Prognosis ALS	93.161				$272,681
Antibiotics from nose and throat commensals that impact pathogen colonization	93.855	The Forsyth Institute	STAN101018-2580		$92,661
Antibody-fucosidase conjugates as therapy for hepatocellular carcinoma	93.398				$30,793
Antigen Presentation and T cell Programming in Human Autoimmune Diseases	93.855	Dana-Farber Cancer Institute (489)	Subaward 1006719		($5,977)
Anti-Interneuron Antibodies in Abrupt-Onset Pediatric Obsessive-Compulsive Disorder	93.242	Yale University	GR106053 (CON-80001750)		$1,045
Applicability of Mouse Breast Cancer Models to Tumor-Immune Network Investigation	93.396				$3,553
Applied Genomics in Infectious Diseases	93.855				$239,621
Applying novel technologies and methods to inform the ontology of self-regulation	93.279	Dartmouth College	R804 R1075		$233,636
Applying statistical learning tools to personalize cardiovascular treatment	93.837				$170,303
ARCADIA CSI (Cognition and Silent Infarcts)	93.853				$14,878

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Architectural Basis of Leptin Transmembrane Signaling	93.847				($50)
Arizona Cancer and Evolution Center	93.397	Arizona State University	ASUB09 ASUB00000009		$22,592
ASD-Relevant Gene-Immune Interactions in the Developing Brain	93.242				$32,952
Assembly of the Central Olfactory Networks in Drosophila	93.173				$312,927
Assessing Photoreceptor Structure and Function in Normal and Diseased Retinae	93.867	Medical College of Wisconsin	2R01EY017607-10;PO# 1746916 5R01EY017607-11; PO 6067879		$29,163
Assessment of Low-Dose Radiation Risk and Mechanisms of Individual Radiosensitivity	93.837				$578,425
Astrocytic Control of GABA Inhibition in Epilepsy	93.853				$71,752
a-Synuclein and LRRK2 in the Pathogenesis of Parkinson's disease	93.853	Harvard University	113140 113140-4		$344,189
ATP-Dependent Chromatin Regulation in Neurodevelopment and Human Disease	93.853				$480,268
ATP-Dependent Chromatin Remodeling in Human Malignancy	93.393				$509,854
Automated Volumetric Molecular Ultrasound for Breast Cancer Imaging	93.394			$85,310	$444,347
Axially-resolved Spectroscopic Ophthalmic Imaging	93.867			$72,701	$446,289
Axonal Hypofunction in a Maternal Immune Activation Model of Autism	93.242				$34,094
Axonal myelination of interneurons in cortex: functional significance and plasticity	93.853				$399,632
B and T Cell Biology of Protection from and Eradication of SIV/SHIV Infection	93.855	Emory University	A019541		$389,890
B- Cell Targeted Induction to Improve Outcomes in Pediatric Lung Transplantation	93.855	Washington University in St. Louis	WU-18-111 / PO: 2934663E		$36,591
B7-H3-Targeted Contrast Agent for Ultrasonic Detection of Breast Cancer	93.399	NuvOx Pharma LLC	1R41CA21354401-STN002		$2,069
Bacterial Cell Wall Composition and the Influence of Antibiotics	93.859				$434,906
Balanced Signaling cues to guide cell transitions in the blood lineage continuum	93.839	University of California, San Francisco	8960sc		$213,641
Bay Area Team Against Resistance	93.353	University of California, San Francisco	10606sc		$522,951
B-Cell Targeted Induction to improve outcomes in Pediatric Lung Transpantation	93.855	Washington University in St. Louis	WU-18-131 (frmly WU-17-257)		$493
BEG4/MIM Function in Epithelial Neoplasia	93.846			$50,164	$493,947
Beta-lactamase fluorescent probes for bacterial detection	93.855				$574,472
Beyond consent: patient preferences for governance of use of clinical data and samples	93.879			$37,170	$102,319
Beyond GWAS of insulin resistance: An integrated approach to translate genetic association to function	93.847				$443,586
BIDS-Derivatives: A data standard for derived data and models in the BRAIN Initiative	93.242			$106,286	$774,688
Big Data Analysis of HIV Risk and Epidemiology in Sub-Saharan Africa	93.855			$204,824	$483,677
Bilateral Closed Loop Deep Brain Stimulation for Freezing of Gait using Neural and Kinematic Feedback	93.853				$57,156
Bilirubin Binding Capacity To Assess Bilirubin Load in Preterm Infants	93.865			$11,713	$17,864
Binding of Epstein Barr Virus EBNA2 unifies multiple sclerosis genetic mechanism	93.RD	Cincinnati Children's Hospital Medical Center	138881/PO3100529997 138881/PO3100620274		$11,143
Binuclear Copper-O2 Intermediates: Thermodynamic and Mechanistic Insights	93.859				$233,134
Biochemical and cell biological mechanisms of signal transduction through the Hedgehog pathway	93.859				$644,329
Biochemical reconstitution of Wnt signaling complexes	93.859				$56,726
Biofilm Lithography: A newparadigm to optically control and study biofilm growth dynamics	93.855				$272,467
Biologic Inhibitor of Galectin-3 for Liver Fibrosis	93.847	MandalMed, Inc.	Prime AW #1R43DK107285-01A1		$53,534
Biological and clinical evaluation of the laryngeal mucus layer	93.173				$232,028
Biological and Psychosocial Mechanisms of Cancer Caregivers' Elevated Health Risk	93.361	University of Miami	SPC-000420		$27,507
Biologics Effectiveness and Safety (BEST) Initiative: Blood and Blood Product Safety Surveillance	93.RD	IQVIA RDS, Inc.	#2017-IMS-SC-S001		$44,500
Biomarkers for Post-Transplant Lymphoproliferative Disorders in Children	93.855			$106,419	$659,181
Biomedical Data Science Graduate Training at Stanford	93.879				$230,294
Biomedical Informatics Training at Stanford	93.879				$781,494
Biophysical mechanisms of mechanical tension sensing at cellular integrin complexes	93.859				$414,558
Biophysical studies of macromolecules and molecular assemblies	93.859				$580,797
Biorepository of Human iPSCs for Studying Dilated and Hypertrophic Cardiomyopathy	93.837				$1,527,289
Biosorter Pro large particle flow cytometer for organismal and large cell sorting	93.351				($23,222)
Bistability and trigger waves in cell signaling	93.859				$65,170
Blood Stem Cell Transplantation as Immunotherapy	93.837			$10,905	$1,538,496
BMT Clinical Trial Network at Stanford	93.839				$121,827
Bone Marrow Grafting for Leukemia and Lymphoma	93.395				$214,674
Brain Aging Studies with Single-Neuron Resolution Using Syringe-Injectable Electronics	93.866				$314,688
Brain and Behavior during Puberty in Klinefelter Syndrome	93.865			$58,309	$410,666
Brain-wide screen for a neural pacemaker of aging	93.310				$3,005,495
Breast Cancer Genetic Study in African-Ancestry Populations	93.393	Vanderbilt University Medical Center	VUMC65378		$17,962
Breast Pre-Cancer Atlas Center	93.353	Duke University	A030743		$5,185
Brief Behavioral Intervention for Insomnia During Chemotherapy	93.395				$404,392
Bringing laser focus to voltage imaging: Enhanced indicators and advanced scanning methods for two-photon recording of dense networks in vivo	93.853			$506,827	$1,008,413
California AHEC- 2017 - 2018 Western Region Public Health Training Center	93.516	University of California, San Francisco	9191sc		($6)
California Area Health Eduction Center (Federal AHEC)	93.107	University of California, San Francisco	10384sc		$26,596

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California Center of BD-STEPS - Finding Causes and Preventives of Birth Defects	93.073				$357,315
CALIFORNIA CENTER OF BD-STEPS II - FINDING CAUSES AND PREVENTIVES OF BIRTH DEFECTS	93.073				$259,076
Caminemos Juntas: A Location-Based Smartphone App for Latinas to Connect with Nearby Walking Partners	93.307	Klein Buendel, Inc.	0321-0172-000		$247,112
Canary Cancer Research Education Summer Training (Canary Crest) Program	93.398				$229,023
Cancer Etiology, Prevention, Detection and Diagnosis	93.398				$486,503
Cancer Immunotherapy Trials Network Central Operations and Statistical Center	93.353	The Fred Hutchinson Cancer Research Center	957722		$242,109
Cancer Systems Biology Scholars Program	93.398				$521,739
Cancer-Translational Nanotechnology Training Program (Cancer-TNT)	93.398				$383,310
Cannabinoid control of epilepsy	93.853			$130,135	$358,721
Capturing the phenotypic landscape of single-nucleotide variation via systematic genome editing	93.859				$661,293
CAR T cell targeting of human islets	93.847			$77,000	$940,319
Cardiac Mitohormesis Protects Against Diabetic Cardiomyopathy Through Mitophagy	93.837				$22,856
Cardiovascular Disease among Asians and Pacific Islanders	93.837	Kaiser Permanente	OOS030097-Stanford-01		$40,406
Cardiovascular Disease Prevention Training Program	93.837				$448,742
Carotid Revascularization and Medical Management for Asymptomatic Carotid Stenosis Trial (CREST-2)	93.853	Mayo Clinic	STA-224063		($649)
Castles made of sand: the genomics of complex behavior	93.859	Georgia Institute of Technology	RE690-G1		$27,789
Causal associations of circulating biomarkers with cardiovascular disease	93.837				$553,811
Causal mapping of emotion networks with concurrent electrical stimulation and fMRI	93.853	California Institute of Technology	S410591		$165,893
Causal mechanisms of distributed brain network function during episodic memory retrieval	93.242				$128,430
Causal variant association mechanisms in TCF21 binding coronary disease loci	93.837				$484,188
CCC for NHLBI Prevention and Early Treatment of Acute Lung Injury Petal-VIOLET	93.838	University of California, San Francisco	10044sc		($270)
CEDAR Template testing	93.RD	Leidos Biomedical Research Inc.	17x074T3		$161,139
Celigo S Imaging Cytometer (200-BFFL-S)	93.351				$167,502
Cell Characterization and Imaging for Regenerative Therapies in Ischemic Diseases	93.837	Indiana University	IN-4688172-LSJU		$99,933
Cell Characterization and Imaging for Regenerative Therapies in Ischemic Diseases	93.837			$41,712	$260,380
Cell cycle regulation of fate outcomes in adult stem cells during adaptive organ growth and homeostasis	93.859				$37,015
Cell Signaling and Cell Decisions	93.859				$410,596
Cell-based therapy in RA: proof of concept	93.846	Case Western Reserve University	RES512531 RES513739		$27,233
Cell-cell communications in neural circuit assembly	93.853				$401,290
Cell-Cell Junctions and Epithelial Homeostasis	93.859				$192,265
Celluar, molecular and quantitative imaging analysis of screening-detected lung adenocarcinoma	93.396	Vanderbilt University Medical Center	VUMC57212- 1		$94
Celluar, molecular and quantitative imaging analysis of screening-detected lung adenocarcinoma	93.989	Vanderbilt University Medical Center	VUMC57212		$63,000
Cellular and Mechanical Mechanisms Regulating Mandibular Distraction Osteogenesis	93.121				$365,392
Cellular and molecular analyses of hematopoietic stem cell [HSC] interactions with bone marrow niches to improve HSC engraftment for transplantation and tolerance induction	93.847				$442,952
Cellular and Molecular Biology Training Program	93.859				$1,173,118
Cellular and Molecular Mechanisms of Atrial Cardiomyocyte Lineage Commitment	93.837				$84,269
Cellular and Soluble Biomarkers of Post Treatment Control in HIV Infection	93.855	J. David Gladstone Institutes	R2462-B		$19,707
Cellular mechanisms in immune-driven placental injury	93.865				$41,712
Cellular Response to Genetic Change	93.859				$483,986
Center for Advanced Magnetic Resonance Technology at Stanford	93.286				$1,153,946
Center for Cancer Nanotechnology Excellence for Translational Diagnostics (CCNE-TD)	93.397				$1,716,347
Center for Dental, Oral, and Craniofacial Tissue and Organ Regeneration (C-DOCTOR)	93.121	University of California, San Francisco	10058sc		$868,613
Center for Excellence in Influenza Research Surveillance	93.RD	Emory University	T951266- 1 PO# A171211		$149,545
Center for Expanded Data Annotation and Retrieval (CEDAR)	93.855			$122,122	$269,768
Center for HIV/AIDS Vaccine Immunology and Immunogen Discovery	93.855	The Scripps Research Institute	5-53727		$72,147
Center for Integrative Research on Childhood Leukemia and the Environment	93.RD	University of California, Berkeley	00009022; PO BB00676408		$12,096
Center for Multi- and Trans-ethnic Mapping of Mendelian and Complex Diseases	93.172			$790,257	$1,140,336
Center for Personal Dynamic Regulomes	93.172				$2,849,080
Center for Solutions for ME/CFS	93.855	Columbia University	2(GG014214) 2(GG014214-02)		$60,696
Center for Sub-Cellular Genomics	93.172	University Of Pennsylvania	575330 PO 4205280		$134,945
Center for the Development of Phenotype-Based Treatments of Autism Spectrum Disorder	93.865	University of California, Davis	A18-0985-S002		$292,490
Center For The Structural Biology of Cellular Host Elements In Egress, Trafficking, and Assembly of HIV (Cheetah Center)	93.859	University of Utah	10044932-05;PO# U000157065		$26,664
Center for Undiagnosed Diseases at Stanford	93.310				$1,659,925
Center on The Demography and Economics of Health and Aging	93.866				$155,801
Centers of Excellence	93.157				$559,723
Central and Peripheral Measures of Pain: Recovery and Resistance	93.865	Boston Children's Hospital	PO# GENFD0001533821		$20,527

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Central Thalamic Stimulation for Traumatic Brain Injury	93.853	Weill Cornell Medical College	170541-03 184028-03; 5UH3NS095554-03		$259,448
Centriolar-ciliary signaling mechanisms in tissue regeneration and differentiation	93.859				$66,294
Cerebellar Structure and Function in Alcoholism - Alzheimer's-focused administrative supplement	93.273			$166,160	$489,005
Cerebrovascular Reserve Imaging with Simultaneous PET/MRI Using Arterial Spin Labeling and Deep Learning	93.286				$352,349
Changes in Bone Quality, Sarcopenia and Fat Distribution in HIV/HCV Patients after HCV Therapy	93.855	University Of Pennsylvania	PO# 4195387		$22,587
Channel structure-based tools for precise interrogation of circuitry and behavior	93.242				$1,181,846
Characterization and Genetics of Objectively-Verified Long Sleep Hypersomnia	93.853				$47,505
Characterization and Targeting the GDNF and Other Pathways in Salivary Stem Cells	93.121			$30,163	$329,144
Characterization of central pain mechanisms using simultaneous spinal cord-brain functional imaging	93.853				$256,852
Characterization of recurrent cancer mutations that cause misregulated translation	93.398				($991)
Characterization of Sexual Dimorphism in the brain	93.853				$410,435
Characterization of the functions of one-carbon metabolism across human cancers	93.398				$80,214
Characterization of the Mechanotransduction complex in hair cells	93.173				$93,171
Characterizing cognitive control networks using a precision neuroscience approach	93.242				$290,802
Characterizing head and neck tumor neoantigens and T cells: looking beyond the usual suspects	93.121				$365,053
Characterizing Low-Density Ganglion Cells in the Primate Retina	93.867				$23,513
Characterizing the assembly and age-related decline of neural circuits in Drosophila by single-cell profiling	93.866				$48,744
Characterizing the CHD8 Complex to Determine its Role in Autism Spectrum Disorder	93.242				$12,340
Characterizing the immune and metabolic profiles of cutaneous T-cell lymphoma in formalin fixed paraffin embedded skin tissue samples	93.398				$46,340
Characterizing the Regulation of Ferroptosis	93.859				$342,089
Charge Cloud Tracker : A High-Resolution, High-DQE, Photon-Counting Energy Discriminating X-ray Detector	93.286			$21,640	$39,273
Chemical biology of innate immunity for treating cancer and autoimmunity	93.310				$555,061
Chemical Glycoproteomics	93.394			$18,883	$370,728
Chemical Mycobacteriology	93.855			$10,932	$363,810
Chemical probes for specific targeting of matrix metallo proteases	93.396				$168,785
Chemical tools for developmental biology	93.859				$898,351
Chemically Triggered Morpholino Antisense Oligonucleotides	93.859	University of Pittsburgh	0047020 (126827-1)		($51,210)
Chemosensory tuft cells and intestinal homeostasis	93.847				$174,628
Chemotactic Signal Transduction	93.859				$2,326
CHILD NEUROLOGIST CAREER DEVELOPMENT PROGRAM (CNCDP)	93.853	Kennedy Krieger Institute	CNCDP		$7,717
Children's Health and Air Pollution in the San Joaquin Valley (CHAPS-SJV)	93.113	University of California, Berkeley	8271		$44,118
Chimeric Mice: Improving Drug Safety	93.847				$571,837
Chiral Inactivation of Amyloid Beta Toxicity	93.866	University of California, Santa Cruz	A18-0271-S001-P0646184		$25,838
Cholesterol Regulation of Lysosomes	93.837				$443,532
Chromatin changes in the thymus epithelium during aging	93.866				$52,761
Chromatin Dynamics During Epithelial Commitment	93.846				$107,612
Chromatin Dynamics in the Cell Cycle	93.859				$53,157
Chromatin dynamics, transcriptional activators and repressors in transition from proliferating progenitors to terminal differentiation during adult stem cell differentiation	93.865				$32,143
Chronic Hypertension and Pregnancy (CHAP)	93.837	University Of Alabama In Birmingham	000503570-006		$22,731
CHS Research Resources for the Cardiovascular Health of Older Adults	93.866	University Of Washington	UWSC11060		$3,615
Ciliary trafficking mechanisms underlying the human genetics of obesity	93.859				$425,461
Circuit mechanisms for encoding naturalistic motion in the mammalian retina	93.853	University of Chicago	FP069821-01		$39,647
Circuit Mechanisms for Prefrontal Control of Remote Memory	93.242				$41,823
CIRCULATING FACTORS THAT REGULATE BROWN AND BEIGE FAT	93.847				$270,821
Citizen Science to Promote Sustained Physical Activity in Low-Income Communities	93.394				$987,647
CITN-10 Neoantigen identification	93.RD	Leidos Biomedical Research Inc.	17X074-TO-2		$23,891
CLARITY: fully-assembled biology	93.242				$327
Clinical Acceptance of the Artificial Pancreas:the International Diabetes Closed Loop (iDCL) Trial Project	93.847	University of Virginia	GB10282 152881		$275,667
Clinical and molecular epidemiology of acute kidney injury after lung transplant.	93.847	University Of Pennsylvania	3918396		$47,470
Clinical Epidemiology of Infectious Diseases	93.855				$178,538
Clinical Genome Resource (ClinGen)	93.172			$1,278,829	$3,321,816
Clinical Pharmacogenetics Implementation Consortium (CPIC)	93.172	St. Jude Children's Research Hospital	112350010-7850863		$462,489
Clinical Validation and Supply of SRI Biodosimeter	93.RD	SRI International	21692		$150,410
Clinically Relevant Genome Variation Database	93.172			$226,361	$407,626
Clinician-scientist training program in otolaryngology	93.173				$229,388
Clonal expansion, resistance to efferocytosis and innate immunity in atherosclerosis	93.837				$504,475
Closed-loop intervention in epilepsy.	93.853			$253,752	$336,618
Clutter Suppression in Echocardiography Using Short-Lag Spatial Coherence Imaging	93.286			$94,241	$461,770
CMP-Neu5Ac: A Central Molecule in Bleeding Diseases and Mediator of a Novel Platelet Effector Function	93.839				$7,182

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Co-engaging CD23 and BCR for enhanced neutralizing antibody responses	93.855				$66,849
Co-Formulations of Amylin Analogues with Insulin Analogues for Treatment of Diabetes	93.847				$285,556
Cognitive Behavioral Therapy for Psychosis (CBTp) Training for ETCH: Extended Consultation & Train the Trainer	93.243	Network180	PR728447		$8,859
Cognitive resilience to Alzheimer neuropathologic changes in the Honolulu-Asia Aging Study and the Nun Study	93.866	Pacific Health Research Institute	21603-01		$193,805
Cohort Filtering Models to Identify Social Program Effects on Health Disparities	93.310				$275,826
Collaborative Research in Computational Neuroscience (CRCNS)	93.867	University of California, Los Angeles	1430 G SA696		$50,827
Combining systems biology and structural biology to find new therapeutics	93.859				$347,976
Committee Leadership: NIH National Clinical Trials Network (NCTN) Grant (U10CA180886)	93.395	Children's Hospital of Philadelphia	FP00015221_SUB699_01		$15,319
Committee Leadership: NIH National Clinical Trials Network(NCTN) Grant (U10CA180886)	93.395	Children's Hospital of Philadelphia	FP00015221_SUB698_01		$23,637
Comparative analysis of PCP signaling architecture	93.859				$369,747
Comparative Medicine Biosciences Training Program	93.351				$250,339
Comparative MHC and KIR immunogenetics in the Great Apes	93.855				$298,191
Comparative Modeling of Lung Cancer Prevention and Control Policies	93.393	University of Michigan	3003859580 PO#3005217536 Sub#3003750928		$289,615
Comparative Modeling: Informing Breast Cancer Control Practice and Policy	93.393	Georgetown University	413458_GR4411138-SU		$245,749
Comparison study of myoelectric readings of the GI tract measured internally and externally in mini-pigs	93.310	G-Tech Medical, Inc.	137338		$25,310
Compounded Neuronal Damage in Comorbid Cigarette Smoking and Addiction	93.273	Indiana University	IN4687305SU / PO#2282884		$178,462
Comprehensive CT Guided Coronary Artery Bypass Graft Surgery	93.837				$159,164
Comprehensive MRI near Total Joint Replacements	93.286				$203,588
Comprehensive Structural and Functional Mapping of Mammalian Colonic Nervous System	93.310	University of California, Los Angeles	1556 G WA054		$62,797
Computational and brain predictors of emotion cue integration	93.242			$289,855	$617,474
Computational and circuit mechanisms for information transmission in the brain	93.853	Cold Spring Harbor Laboratory	64100314		$162,234
Computational Methods for Identification of Genetic Factors Affecting the Response to Drug Abuse	93.279			$402,959	$1,382,206
Computational tools for understanding chemically modified RNA structure and interactions	93.396				$109,861
Computational, Neural, and Behavioral Studies of Competition-Dependent Learning	93.242	Princeton University	SUB0000163		$56,519
Computing, Optimizing, and Evaluating Quantitative Cancer Imaging Biomarkers	93.394			$11,104	$657,207
Confirming the efficacy/mechanism of an adaptive treatment for adolescent anorexia nervosa	93.242			$329,856	$851,045
Confounder-Corrected Quantitative MRI Biomarkers of Hepatic	93.847	University of Wisconsin	550K410		$43,670
Congregate air sampling for population-based detection of tuberculosis	93.855			$87,130	$354,520
Connecting early signaling dynamics with fat cell differentiation using fluorescent biosensors and single cell imaging	93.847				$36,025
Consequences of Prolonged Febrile Seizures in Childhood	93.853	Duke University	2832377 2832791		$20,451
Conserved regulation of the switch from proliferation to differentiation in the germ line stem cell lineage	93.859				$351,023
Consortium for the Study of Chronic Pancreatitis, Diabetes, and Pancreatic Cancer: Coordinating and Data Management Center	93.847	University of Texas MD Anderson Cancer Center	3000971318		$35,834
Consortium for the Study of Chronic Pancreatitis, Diabetes, and Pancreatic Cancer: Coordinating and Data Management Center	93.847	University of Texas MD Anderson Cancer Center	3001152175		$3,261
Contrast-Enhanced Ultrasound Evaluation of Focal Liver Lesions in Patients with Cirrhosis or Other Risk Factors for Developing HCC	93.393	Thomas Jefferson University	080-30000-S27901; #2000072090		$86,282
Contribution of astrocytes to the Fragile X Syndrome	93.242	University of California, Santa Cruz	A17-0285-S001-P0636133		$64,964
Contribution of Gigantocellular neurons of the medullar reticular formation to awakening from a low brain activity state	93.853	Weill Medical College of Cornell University - New York	180533 190413		$264,652
Contribution of renal tubule insulin receptor on proximal tubule sodium transport and hypertension in the Metabolic Syndrome.	93.847				$52,947
Control and coordination of the maternal-to-zygotic transition.	93.865				$338,624
Control of Symbiotic Gene Expression in Sinorhizobium Meliloti	93.859				$2,418
Controlling the rate of adipocyte differentiation: Experiments and theory	93.847				$268,193
Controlling tissue size by noise and feedback	93.847				$224,720
Convergence of genetic and gestational immune mechanisms in 16p11.2-related ASD	93.242				$458,422
Convergence of genetic and gestational immune mechanisms in CHD8-related ASD	93.242				$522,213
Coordinating Center for the Undiagnosed Disease Network Phase II	93.172	Harvard University	153056.5112937.0506		$98,755
Coordination Center for Open Collaboration in Systems Biology - Supplement	93.396	Sage Bionetworks	CSBC-S2SU2017		$41,980
Core Infrastructure and Methodological Research for Cancer Epidemiology Cohorts	93.393	Columbia University	5(GG013725-01) SAPO# G12768 5(GG013725-03)		$351,233
Coronary Magnetic Resonance Angiography	93.837				$319,397
Correction of Mucopolysaccharidosis type 1: Targeting safe harbor loci using genome editing	93.853				$210,972
Cortical Hemodynamism and Oxygenation During Sleep and Cognition: Window to Cognitive Impairment and Neurodegeneration in Aging	93.866				$222,433
Cortisol Receptor Polymorphisms And Cortisol-Induced Emotion Changes In Major Depression	93.242				$216,879
Cost Effective, Synergistic Macromolecular Structure Determination, Analysis & Simulation	93.859				$609,161
Covalent Profiling of RNA Targets and Off-targets	93.859				$251,661
Coverage, Price, and Reimbursement for Multigene Tests for Cancer and Related Conditions	93.393	University of California, San Francisco	10856sc		$6,993

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CRCNS: Role of Mossy Cells in Gating Plasticity Hippocampal Granule Cells	93.242				$1,392
Creating an artificial intelligence therapy-to-data feedback loop for child developmental healthcare	93.879				$19,283
Creation of new tools to study human microglia using blood cells	93.242				$64,617
Cross modal integration of molecular and physiological networks in ASD 2/2	93.242				$927,610
Cross-Species Multi-Modal Neuroimaging to Investigate GABA Physiology in Fragile X Syndrome	93.865				$292,867
CryoEM Data Collection Facility Consortium at NCMI	93.859				$488,931
CT Perfusion to Predict Response to Recanalization in Ischemic Stroke Project 2 (CRISP 2)	93.853				$71,211
CTLA4 expressed in B-1a regulates B-1a immune function	93.855				$625,509
Curcumin Supplementation for Improving Vascular and Cognitive Function in Chronic Kidney Disease	93.837	University of Iowa	W001052426 PO 1001936977		$22,723
Customized MSCs to Enhance Healing of Bone Defects	93.846				$405,013
CV7000	93.351				($23,310)
CyTOF Analysis of Immune Subsets After Tolerance Induction to Kidney Transplants	93.855	University of Wisconsin	Subaward 766K861 842K100		$122,866
DASSIM-RT and Compressed Sensing-Based Inverse Planning	93.395				$314,814
Data Fusion-A Self-Scaling, Open Source Registry Advancing Pediatric Pulmonary Vascular Disease Research	93.838	University of Colorado Denver	FY15.369.003; 2-5-M6137		$7,068
Data-Mining Clinical Decision Support from Electronic Health Records	93.113				$190,156
Data-Rich Strategies for Programming Ligand-Responsive RNA Regulatory Systems	93.859				$245,390
Deciphering the Inositol Phosphate Code in Viral Pathogenesis and Immunity	93.855				$125,904
Decoding the regulatory architecture of the human genome across cell types, individuals and disease	93.172				$793,798
Decoding the RNA structrurome: method development and function analysis	93.172				($4,168)
Deconstructing Arousal Regulation Circuits for Optimal DBS Therapy Design	93.853				$409,022
Deconstructing the network mechanisms of chronic pain and reward in the amygdala	93.279				$80,866
Deep Learning for Pulmonary Embolism Imaging Decision Support: A Multiinstitutional Collaboration	93.879			$9,415	$285,756
Deep learning frameworks for regulatory genomics.	93.310				$374,975
Deep Super-localization Microscopy and Effectively Unbleachable Labeling for 4D Nucleomics	93.310				($299)
Defining Alcohol Binding Sites in Ligand-Gated Ion Channels	93.273			$13,841	$45,206
Defining and Reconstructing the Human Ancestral Microbiome	93.213				$1,070,649
Defining BMP-responsive lncRNA for bone regeneration	93.121				$111,069
Defining Cell Type Specific Contributions to fMRI Signals	93.242				$706,026
Defining modifiers and mechanisms of RAN translation	93.866				$446,558
Defining the Dynamic Epigenetic Landscape During Epithelial Commitment	93.846				($832)
Defining the Impact of Injuries in the Elderly	93.866				$33,549
Defining the Medulloblastoma Cancer Stem Cell Lineage Hierarchy by Notch Family Signaling	93.398				$36,038
Defining the molecular basis of autism caused by inherited null mutations in BAF53B	93.242				$38,332
Defining the Molecular Mechanism of Hypertrophic Cardiomyopathy with Human Induced Pluripotent Stem Cells	93.837				$188,583
Defining the Molecular Mechanisms of Misfolding Protein Sequestration	93.859				$55,171
Defining the Neuromolecular Signature of TMS-Augmented Hypnotic Analgesia in Fibromyalgia Syndrome	93.213				$24,473
Defining the novel eukaryotic biology of the Apicomplexan plastid	93.310				($192)
Defining the Role of Host Hsp70 Subnetworks in Dengue Virus Replication	93.855				$564,143
DEFUSE 3: Endovascular Therapy Following Imaging Evaluation for Ischemic Stroke 3	93.853			$19,327	$402,494
Defuse 3: EnDovascular ThErapy Follwing Imaging EvalUation for ISchemic StrokE 3	93.853	University of Cincinnati	010085- 128152		$95
Delineation of genetic architecture underlying complex traits at molecular, individual and population levels	93.859				$298,348
Dengue Human Immunology Project Consortium (DHIPC) - Systems Vaccinology of the Vi Conjugate Typhoid Vaccine in Infants	93.855	Icahn School of Medicine at Mount Sinai	0255-8677-4609		$1,953
Designer Tregs for restoring tolerance in patients with type 1 diabetes	93.847	University of California, San Francisco	10345sc		$154,152
Designing Food Voucher Programs to Reduce Disparities in Healthy Diets	93.837			$89,181	$542,912
Designing new aminoglycosides to alleviate inner ear toxicity	93.173				$655,961
DESI-MS detection of positive surgical margins in kidney cancer	93.394				$165,653
Detection of asymptomatic Salmonella enterica serotype Typhi and Paratyphi A carriage by serum antibodies targeting YncE	93.855	Massachusetts General Hospital	233137		$21,714
Determinants of age-induced hearing loss and reversal strategies	93.866	University of Nevada	UNR-17-46		$197,883
Determinants of ultra-low viral reservoirs in HIV infected children	93.865	University Of Washington	UWSC10077 BPO26954/BPO33467		$222,219
Determining feedback mechanisms between cell cycle and cell fate in pluripotent cells	93.859				$85,486
Determining how the G1/S cell cycle transition regulates the homeostasis of adult intestinal stem cells	93.859				$42,892
Determining the molecular mechanism of cell size control.	93.859				$508,234
Determining the Role of TCAB1 in Shaping Telomerase Function	93.866				$528,114
Developing 3D Craniofacial Morphometry Data and Tools to Transform Dysmorphology	93.121	University of Colorado Denver	FY16.236.006 /PO# 1000653236 FY16.236.008- 03; 2-5-M7102		$18,505
Developing a mechanistic neurobiological model of exposure therapy response based on fear extinction theory	93.242				$200,792
Developing a patient-centered model of the risk of perioperative complications in spine surgery	93.226				$304,910

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Developing and Testing a Tool for Preference Elicitation in Carpal Tunnel Syndrome	93.846				$176,232
Developing approaches for universal organ transplantation	93.310				$357,737
Developing data tools to reduce CVD disparities via Health Information Exchanges	93.307				$182,869
Developing nanoparticle optical reporters of compressive, tensile, and shear forces for use in living cells and tissues.	93.859				$175,343
Developing nanoscale electrophysiology sensors for robust intracellular recording	93.859				$545,834
Developing Neuropathological Criteria for CTE	93.853	University Of Pennsylvania	568538; PO# 4065403 568538; PO #4344273		$36,013
Developing Novel Neuroprotective Strategies for EAE/Optic Neuritis	93.867				$278,497
Development and Cross-Validation of a Hospital Risk Screening Tool for Posttraumatic Psychological Disorder	93.307	Palo Alto Veterans Institute for Research	CAS0012-02		$62,654
Development and Translation of High Performance Receive Arrays for Pediatric MRI	93.286			$319,318	$691,230
Development and Translation of Hyperpolarized C-13 Prostate Cancer MRI Methods	93.286	University of California, San Francisco	11361sc		$13,124
Development and Validation of Radiation-Free Pediatric Renal Function Quantification	93.286			$121,928	$601,747
Development of a Commercial Platform for Discovery and Validation of Key Microbial Metabolites in CNS Disorders	93.279	Second Genome, Inc.	1R44DA043954 2017		$102,611
Development of a Multi-Virus, Whole Genome Sequencing Platform for Post-Transplantation Virus Characterization	93.855				$109,628
Development of a novel treatment for hyperbilirubinemia-induced kernicterus	93.865				$280,199
Development of Beta-Cell-Targeted Regenerative Therapeutics Using A Novel Prodrug Strategy	93.847				$54,247
Development of Face Perception: Cross-sectional and Longitudinal Investigations	93.RD				$446,401
Development of lariat-shaped caged morpholinos for optochemical gene regulation	93.859			$6,184	$1,389
Development of microfluidic blood-brain tumor barrier model to screen chemotherapeutic strategies for breast cancer brain metastases	93.398				$152,053
Development of novel protein-based therapeutics for lung cancer	93.395	University of California, San Francisco	10698sc 10721sc		$129,929
Development of Visual Connections	93.867				$418,793
Development, Validation and Application of Metabolic Imaging in Glaucoma	93.867			$62,967	$398,977
Developmental Pathophysiology of Synapses in a Mouse Model of Fragile X Syndrome	93.865				$255,242
Developmental Synaptopathies Associated with TSC, PTEN, and SHANK3 Mutations (CT Pilot)	93.853	Boston Children's Hospital	GENFD0001329602 GENFD0001526726 GENFD0001526738		$115,596
Developmental trajectory of anxiety, avoidance, and arousal in girls with the FMR1 full mutation	93.242				$924,741
Developmental-Behavioral Pediatrics Training Program	93.110				$196,065
Developmentally programmed translational control of specialized cell cycles in male meiosis	93.859				$328,097
Diabetes, Endocrinology and Metabolism Training Grant	93.847				$362,358
Diagnostic signatures of Zika virus pathogenesis	93.855			$10,494	$139,242
Dietary and Microbial Reprogramming of Intestinal Microbiota-Produced Metabolites	93.847			$136,518	$703,082
Dietary Modulation of Neuroinflammation in Age-Related Memory Disorders	93.866	Columbia University	1(GG014813-01)		$23,730
Direct measurement of gene-environment interactions by high-throughput precision genome editing	93.113				$4,136
Direct visualization of cell-type specific Alzheimer¿s disease networks for drug development	93.866				$280,056
Discovering genetic and hormonal mechanisms underlying diabetes risk from flies to humans	93.847				$208,621
Discovering the mechanism of GPCR-mediated arrestin stimulation to enable effective drug therapies	93.859				$201,791
Discovering the mechanisms and functions of signaling by the calcineurn beta1 isoform	93.859				$126,312
Discovery and characterization of brain-wide neuromodulatory circuits regulating arousal	93.242				$108,461
Discovery and Development of Optimal Immunotherapeutic Strategies for Childhood Cancers	93.353	Children's Hospital of Philadelphia	Sub3201380619 PO200314999-RSUB		$3,180
Discovery and Development of Optimal Immunotherapeutic Strategies for Childhood Cancers (Project 1)	93.353	Children's Hospital of Philadelphia	3201380619 PO 20028638-RSUB		$46,903
Discovery and Development of Optimal Immunotherapeutic Strategies for Childhood Cancers (Project 2)	93.353	Children's Hospital of Philadelphia	3201380619 / PO 20031486-RSUB		$443,309
Discovery and Development of Optimal Immunotherapeutic Strategies for Childhood Cancers (Project 3)	93.353	Children's Hospital of Philadelphia	PO 20031487-RSUB / 3201380619		$3,348
Discovery and Engineering of Plant Natural Product Pathways	93.859				$358,756
Discovery of protein aggregates during vertebrate aging and neurodegeneration	93.395	University Of Minnesota	P005569701		$249,937
Discovery of protein aggregates during vertebrate aging and neurodegeneration	93.866				$511,016
Discovery of Synthetic Lethal targets for Recurrent Epigenetic Mutations in Acute Myeloid Leukemia	93.398				$96,864
Disentangling the human-vector relationship to disrupt dengue and chikungunya outbreaks in Kenya	93.855			$55,838	$257,627
Disparities in Care, Morbidity & Survival Among Infants with Birth Defects	93.307			$36,292	$290,503
Disparity Processing in Human Visual Cortex	93.867				$375,315
Disrupting IgE-Fc¿R1¿ Interactions: Novel Therapies for Allergic Disease	93.855				$41,801
Disruption of Wnt secretion via conditional deletion of Porcupine and Wntless in the developing mouse cochlea	93.173				($306)
Dissecting hypothalamic pathways that regulate sexually dimorphic behaviors	93.853				$17,113

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Dissecting Mechanisms of Granuloma Macrophage Polarization and Granuloma Formation in Chronic Salmonella Infection	93.855				$93,024
Dissecting Neural Circuit Computations in the Peripheral Visual System	93.867				$331,793
Dissecting the cognitive roles of hippocampus and other temporal lobe structures in patients undergoing epilepsy surgery	93.853	Emory University	T234780		$2,555
Dissecting the function of the ß3 subunit of the GABAA receptor ex vivo and in vivo	93.853				$58,486
Dissection of the role of serotonin circuits in reward and aversion	93.242				$137,890
Disseminating a validated mouthguard sensor to investigate the effect of head impacts on brain health	93.853				$216,707
Distinct contributions of Gli2 in breast cancer epithelium and stroma	93.398				$67,614
Diverse Ancestry Biobank to Map Biomedical Traits and Elucidate Health Disparitie	93.172	Mt. Sinai School of Medicine	0255-6425-4609		$47,461
Diversifying interferon functions through combinatorial and structural biology	93.398				$28,311
Diversity Action Plan for Summer Research	93.172				$11,974
DIVINCI: Dissection of Influenza Vaccination and Infection for Childhood Immunity	93.855	St. Jude Children's Research Hospital	112525010-7883509		$14,887
DNA Repair and Mitochondrial Dysfunction in T Cell Aging	93.855				$153,591
DNA-carbon Assemblies for Multispectral Imaging	93.859				($15)
Do Genotype Patterns Predict Weight Loss Success for Low Carb vs. Low Fat Diets?	93.847				$389
Do Hair Cortisol and Hair Oxytocin Represent the Stressful and Supportive Experiences of Preschool Children?	93.865				$33,209
Dopamine degradation pathway and alpha-synuclein aggregation	93.853			$10,754	$412,224
Dopamine modulation of synaptic plasticity and integration in the striatum	93.853				$195,313
Dual Modality X-ray Luminescence CT for in vivo Cancer Imaging	93.394				$83,320
Dynamic Brain Mechanisms of Proactive and Reactive Control in Childhood ADHD	93.242				$133,774
Dynamic Imaging of EMT in the Breast Cancer Microenvironment	93.396				($24)
Dynamic Mechanisms of Fate Control during Epithelial Organ Renewal NIGMS Administrative Supplements for Equipment NOT-GM-19-013	93.859				$386,156
Dynamic pathways of eukaryotic translation initiation	93.859				$623,759
Dynamic polarity mechanisms controlling stem cell asymmetry during tissue development	93.859				$5,840
Dynamic regulation of whole brain circuit function by basal ganglia pathways	93.853				$555,936
Dynamics of developmental strategies that drive cell identity and plasticity	93.859				$38,109
Dynamics of Translation	93.859				$643,026
Early Biomarkers in Neonatal Brain Injury	93.853			$12,326	$152,667
Early language processing skill and school-relevant outcomes in emerging Spanish-English bilinguals	93.865				$614,662
E-cigarette aerosol effects on the cardiovascular system in rodents	93.837				$380,414
Economic modeling for prevention of disease	93.084	University of California, San Francisco	8776sc		$5,925
EDAC: ENCODE Data Analysis Center	93.172	University of Massachusetts	WA00665466/OSP2017188 WA00805792/OSP2017188		$89,588
Effect of Blood Transfusion Practices on Cerebral and Somatic Oximetry	93.839			$47,452	$223,190
Effect of Bypass Policies on Stroke Treatment in a National Sample of Medicare Beneficiaries	93.226				$38,917
Effect of Changing NICU patient volumes and levels of care on neonatal outcomes	93.865			$130,723	$287,152
Effect of Microgravity on Drug Responses Using Engineered Heart Tissues	93.350			$99,350	$335,153
Effect of Radiotherapy on Dendritic Cell Subsets: Implications for Immunotherapy	93.396				$291,538
Effects of aging on primary and secondary vaccine responses in a 15-year longitudinal cohort	93.RD				$1,397,588
Effects of Environmental Stimulation and Nurturance on Neural and Endocrine Function in Infants	93.865				$134,551
Effects of FLASH Radiation on Cancer and the Immune Response	93.395				$49,776
Effects of hypertrophic cardiomyopathy (HCM) causing mutations on sequestration of human ß-cardiac myosin via intra-molecular interactions	93.837				$57,598
Effects of IgE Blockade on T Cells in Food Allergy	93.855				$415,488
Effects of maternal immune activation on GABRB3-deficient neocortical progenitors	93.865				$37,530
Effects of Maternal Obesity on Offspring Immune System	93.865				$98,926
Effects of Microenvironmental Stiffness on Epigenetic Regulation	93.398				$67,814
Effects of pregabalin and thrombospondins on enhanced excitatory connectivity, new synapse formation and epileptogenesis after neocortical injury	93.853				$307,942
Effects of sanitation on pathogen transmission and child health in Bangladesh	93.865	University of California, Berkeley	00008599/BB00517723	$67,328	$66,868
Effects of Social Gaze Training on Brain and Behavior in Fragile X Syndrome	93.865				$386,232
Effects of TrkB Activation on Abnormalities in Neocortical FS interneuron	93.853				$331,981
Effects of Western and Mediterranean Diets on Metabolic and Neuropathologic Risk Factors for Alzheimer's Disease in Nonhuman Primates	93.866	Wake Forest University	WFUHS 114989		$136,880
Efficacy of Twice Weekly Hemodialysis in Patients with Residual Kidney Function	93.847	Palo Alto Veterans Institute for Research	SIT003-01		$3,535
Elafin Therapy for Pulmonary Arterial Hypertension	93.838			$608,477	$1,963,638
Electronic Bridge to Mental Health (eBridge) for College Students - Supplement	93.242	University of Michigan	3003236141 Subaward 3004658330		$80,319
Electronic Structure of Heme Enzyme Intermediates from Resonant Inelastic X-ray Scattering and L-Edge X-ray Absorption Spectroscopy	93.859				$56,437

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Electrophysiological basis of cortical plasticity in repetitive transcranial magnetic stimulation treatment	93.242				$24,419
ELSI.hub: National Center for ELSI Resources and Analysis	93.172				$2,431
Elucidate the Mechanisms Underlying Inhibition Induced Devaluation	93.279				$35,452
Elucidating Disease Pathogenesis in Autoimmune Polyendocrine Syndrome Type 1	93.855	Cincinnati Children's Hospital Medical Center	140755 PO#3100627514		$98,191
Elucidating Genotype-Phenotype Relationship of Congenital Cardiomyopathies	93.837				$449,110
Elucidating Neuron-Intrinsic Molecular Mechanisms of Optic Nerve Regeneration	93.867				$369,122
Elucidating Novel Mechanisms Underlying Prostate Cancer Development	93.395				$71,185
Elucidating the Function of Inhibitory Brain Circuits Involved in Anxiety	93.242				$50,401
Elucidating the role of nascent RNA in enhancer-promoter communication and three-dimensional genome organization	93.393	Harvard University	152543.5104446.0102 152543.5104446.0202		$232,177
Elucidating the Role of the CLCF1-CNTFR Signaling Axis for Lung Cancer Treatment	93.398				$41,192
Elucidation of the Molecular Mechanisms of Optineurin in Glaucomatous Degeneration	93.867				$10,293
Emotion Dysregulation and Sleep-Time Masticatory Muscle Activity in Sleep Bruxism	93.121				$726,748
Enabling ethical participation in innovative neuroscience on mental illness and addiction: towards a new screening tool enhancing informed consent for transformative research on the human brain	93.242			$15,772	$880,335
Enabling reliable cardiovascular simulations via uncertainty quantification	93.286			$139,227	$397,109
Enabling Technologies for Human-Machine Hybrid Tissues	93.310				$479,815
Endothelial Injury, BMPR2 Dysfunction and Macrophage Activation Cause EndMT and PAH	93.838			$457,589	$981,877
Endothelial Toll-like Receptor 3 in the pathogenesis and therapy of Pulmonary Arterial Hypertension	93.838	Virginia Commonwealth University	FP00007971_SA001		$3,833
Endothelial-pericyte interactions in the pathogenesis of pulmonary arterial hypertension	93.838				$603,881
Endovascular Interventional MRI: Optimizing Tools and Techniques at 3T	93.286	University of California, San Francisco	11070sc		$68,637
Engaging self-regulation targets to understand the mechanisms of behavior change and improve mood and weight outcomes	93.837	University of Illinois at Chicago	5UH2HL132368-03: SUB# 7845-06 Subaward 17357-00		$402,732
Engineered biomaterials to modulate cell-cell signaling for the robust expansion of stem cells	93.286				$33,271
Engineered matrix microarrays to enhance the regenerative potential of iPSC-derived endothelial Cells	93.837				$385,353
Engineered Protein Hydrogels to Modulate Adipose-derived Stromal Cell Secretome and Exosomes for Injectable Myocardial Infarction Therapy	93.837				$173,596
Engineering a multispecific receptor antagonist to inhibit cancer metastasis	93.395				($239)
Engineering Cytoskeletal Motors	93.859			$48,902	$302,306
Engineering High Reliability Learning Lab (EHRLL)	93.226	Harvard University	115380-5109892		$62,881
Engineering of macrophage phagocytosis for cancer and stem cell immunotherapy	93.395				$222,665
Engineering Yeast for High Titer Production of Monoterpene Indole Alkaloid Natural Products	93.213	University of California, Los Angeles	0130 G WA210		$105,396
Enhanced Bone Healing Around Implants by Transplanted NF-kB Driven Immunomodulating MSCs	93.846				$291,975
Enhanced Clinical Diagnosis of Early Osteoarthritis	93.846				($14)
Enhanced Stem Cell Therapy with Rehabilitation Strategies for Peripheral Nerve Regeneration	93.865				$26,390
Enhancement of Natural Killer Cell Effector Functions	93.393				$3,105
Enhancer evolution and the origins of vertebrate brain development	93.853				$62,958
Enhancing Cancer Immunotherapy: Targeting the Tumor and Targeting the Host	93.395				$1,028,656
Enhancing potency and durability of immunotherapies for neuroblastoma	93.395	Children's Hospital Los Angeles	RGF011027-B		$208,754
ENIGMA World Aging Center	93.866	University of Southern California	109720643 / PO# 50731238		$39,814
Ensemble neural dynamics in the medial prefrontal cortex underlying cognitive flexibility and reinforcement learning	93.853				$138,490
Environmental Arsenic Exposure, Microbiome, and Human Health	93.113				$94,853
Environmental, Social and Biological Factors and Disparities in Preterm Birth	93.113	University of California, San Francisco	10697sc		$10,180
Enzyme and Pathway Engineering for in vivo Production of Anticancer Noscapine Derivatives	93.213				$60,232
Epidemiology and management of chronic kidney disease in South Asians	93.847			$25,650	$193,912
Epidermal Signaling Regulators	93.846				$247,761
Epigenetic landscapes and regulatory divergence of human craniofacial traits	93.121			$318,811	$547,316
Epigenetic Mechanisms and Targeting in MLL Leukemia	93.396				$311,505
Epigenetic Regulation of Longevity in Response to Environmental Signals	93.866				$21,427
Epigenetic Regulation of PDE Signaling in Dilated Cardiomyopathy	93.837				$66,026
Epigenetic, Transcriptional, and Microenvironmental Determinants of Human HSC Self-Renewal	93.839				$396,622
Epigenetics in the extreme -investigating heritability driven by disordered RNA binding proteins in development and cancer	93.859				$81,259
Epilepsy Training Grant	93.853				$176,469
Escalating Proportion of Weight-Loss Maintainers Via Modules Prior to Weight Loss	93.837			$19,936	$648,166
Establishing a task-evoked magnetic resonance spectroscopy approach for testing the GABA deficit Hypothosis in Schizophrenia	93.242	Palo Alto Veterans Institute for Research	YOJ0009-01		$32,055
Estrogen reverses progestin-mediated loss of genital mucosal barrier function	93.865			$192,161	$594,836
Ethanol and aldehyde dehydrogenases in health and disease	93.273				$329,656

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Ethical challenges of whole genome sequencing in care of critically ill children	93.172				$227,891
Ethics of Inclusion: Diversity in Precision Medicine Research	93.172			$51,681	$71,938
Eunice Kennedy Shriver NICHD Cooperative Multicenter Neonatal Research Network	93.865				$289,144
Evaluating GWAS AMD Candidate Loci by Gene Editing in Human iPS Cells	93.866			$33,364	($527)
Evaluating health and economic effects of targeted strategies in TB/HIV	93.855	Yale University	GR101920 (CON-80001107)		$47,051
Evaluating the Effectiveness of an Online Small-Group Self-Management Workshop for Rural Caregivers of Individuals with Alzheimer's Disease and Related	93.866	University of California, San Francisco	10987sc		$50,084
Evaluating the potential of human induced pluripotent stem cells (hiPSC) for cartilage repair.	93.846				$431,627
Evaluating the Role of 24-hour Urine Testing in Urinary Stone Disease	93.847				$60,667
Evaluating the role of allergen dose and duration in the safety and efficacy of multiallergen oral immunotherapy with Omalizumab	93.855				$249,361
Evaluation of genetic, clinical and environmental risk factors to establish effective screening strategies for second primary lung cancer	93.393			$132,306	$573,073
Evaluation of Machine Learning to Mobilize Detection and Therapy of Developmental Delay in Children	93.865				$149,600
Evidence Based Evaluation and Acceptance of Donor Hearts for Transplantation	93.837			$281,958	$425,186
Evolution of drug resistance in Candida glabrata	93.855			$13,352	$187,757
Examination of the molecular features and function of the hair cell-synaptic complex in the spontaneously and Atoh1-enhanced regenerating adult mouse utricle	93.173				$42,062
Executive Function in Preschoolers: Characteristics and Response to Treatment	93.865				($675)
Exome sequencing in Diverse Populations in Colorado & Oregon	93.RD	Kaiser Permanente	OOS030229-Stanford		$10,229
Exosomes and the Immune Response in Allograft Outcomes in Pediatric Transplant Recipients	93.855				$389,106
Exploring a promising design for the next generation time-of-flight PET detector	93.394			$42,438	$414,105
Exploring Multiple Environmental Exposures in Combination as Risk Factors for Adverse Pregnancy Outcomes	93.865				$53,152
Exploring Novel Epilepsy Pathways	93.853	University of Iowa	1001876082		$11,515
Exploring thalamocortical neural state space for adaptive closed-loop deep brain stimulation of epileptic networks.	93.853				$38,651
Exploring the mitochondrial function of TSEN in neuronal development and maintenance	93.242				($344)
Extended DNA synthesis using a library-based CRISPR/Cas9-engineered enzyme	93.172				$146,380
Extracellular vesicles, small RNAs, and intercellular communication in Entamoeba histolytica	93.855				$155,572
Failure to rescue in frail surgical patients	93.866				$86,519
Family-building After Cancer: Preferences, Decisions, and Planning for Young Female Survivors	93.398				$54,862
Fear learning in adolescents with chronic pain: Neural and behavioral mechanisms	93.865			$27,213	$580,800
Feasibility of in-home semen testing in a North American preconception cohort study	93.865	Boston University	4500002549		$38,478
Feasibility Study of New Method of Diagnostic and Prediction of Painful CIPN	93.394	LASMED, LLC	1R43CA20676901A1		($17,125)
Fibroblast lineage mechanisms of scarless skin healing	93.859				$208,445
Final Clinical Studies for Submission of a Pre-Market Approval Application to the FDA for a Bionic Pancreas that Automates Type 1 Diabetes Management	93.847	Boston University	4500002011		$275,650
Fitness Effects of Beneficial Mutations	93.859				$96,883
Fitness for Use of Electronic Health Records as Source Data for Clinical Research	93.RD	Duke Clinical Research Institute	EPM-6971		$36,385
fMRI of Emotion Regulation Mechanisms in CBT vs. MBSR for Social Anxiety Disorder	93.242				($2,418)
fMRI-Based Biomarkers for Multiple Components of Pain	93.279	University of Colorado, Boulder	1550989 & PO#1000292326		$64,326
Focal Sustained Release Chemotherapy-Loaded Biomaterials at Tumor Sites	93.853	Tufts University	HH4218; PO# EP0173100		$199,410
Folding@Home: Simulating Folding on the Millisecond to Second Timescale	93.859				$288,169
Forecasting tumor evolution: Can the past reveal the future?	93.310				$414,918
Forming science-industry partnerships to link everyday behaviors to well-being	93.866			$10,515	$180,928
Foundations of MRI Cartigraphy for Mesoscale Organization and Neuronal Circuitry	93.242	University of California, Berkeley	00009347/PO#:BB00836520		$143,784
Foundations of MRI Corticography for mesoscale organization and neuronal	93.242	University of California, Berkeley	000009346/PO# BB00840113		$178,933
From Enrichment to Insights	93.879				$723,206
From structure to therapy: the TRiC Chaperonin network in Huntington's disease	93.853	University of California, Irvine	1206439-1-GALLC 2016-3341 2017-3505		$409,315
Function and circuitry of adaptive inhibition in the retina	93.867				$208,597
Function of LOXHD1 in mechanosensory hair cells	93.173				$413,893
Function of MEF2 in Neuroprotection and Neuro-regeneration Following Stroke	93.867				$364,509
Function of Neurexins	93.242				$593,348
Function of PHD Domain Proteins in Chromatin Regulation	93.859				$560,413
FUNCTIONAL ANALYSIS OF PATHOGENIC AND PROTECTIVE PEANUT ALLERGEN-SPECIFIC HUMAN ANTIBODIES	93.855				$464,346
Functional and Translational Epigenomics of Acute Lymphoblastic Leukemia	93.393				$268,217
Functional Characterization of the Alzheimer's Disease Epigenome	93.866				$110,748
Functional compartmentalization of hedgehog signal transduction in primary cilia	93.859				$180,083

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Functional genetics of human innate immunity in the bimodal gamma delta T cell response to Epstein-Barr Virus and in education of NK cells and their re-education to respond to autologous cells	93.855				$142,142
Functional heterogeneity of Hypocretin neurons	93.242				$438,177
Functional organization of neural circuits underlying movement control	93.853				($12)
Functional Proteomic Analysis and Biomarker Identification in a Novel Mouse Model of Metastatic Hepatocellular Carcinoma (HCC)	93.398				$204,918
Functional-Neuroanatomy of High-Level Visual Cortex: A Quantitative Multimodal Approach	93.867				$254,665
Fundamental Studies of RNA Conformational Thermodynamics	93.859				$72,595
Fundamental Studies of RNA Folding	93.859			$237,058	$734,855
G Protein Coupled Receptor Structure, Dynamics and Signaling	93.853				$569,835
GABA Driven Depolarization in Early Human Cortical Development	93.853				$146,743
GABAergic Neurophysiology in Autism Spectrum Disorder	93.242				$142,975
GABRB3 and Placental Vulnerability in ASD	93.242				($10)
Gaining insight into psychiatric disease by engineering piece by piece the human brain in vitro.	93.242				$530,693
Gene Expression Analyses of the Human Microbiome During Pregnancy through Metatransciptomics	93.865				$121,436
Gene expression profiling of IPSC derived neurons in Autism Spectrum Disorder	93.242			$261,165	$713,389
Gene Networks Influencing Psychotic Dysconnectivity in African Americans	93.242	Boston Children's Hospital	GENFD0001624607		$16,197
Gene Networks Influencing Psychotic Dysconnectivity in African Americans	93.242	Yale University	GK000076 (CON-80000352) GK000704 (CON-80000647))		$19,717
Gene Ontology Consortium	93.172	University of Southern California	101524296 PO#50659816 1028109-100-EALDU		$548,204
Gene Regulation as a Foundation for Autoimmune Disease Prevention	93.855	Cincinnati Children's Hospital Medical Center	304790 PO#3100606276		$81,926
Gene Regulation During Early Development c.Elegans	93.859				$392,844
Gene Silencing and Gene Editing in Phototransduction	93.867	Columbia University	2(GG012115-01)		$55,000
Generation of highly selective activity based probes using chemically modified phage	93.286				$545,743
Genes, cells, and pathways that regulate urochordate allogeneic stem cell competition and their mammalian homologues	93.859				$393,185
Genetic and Biochemical Interrogation of Rotavirus-Cohesin Interaction	93.855				$95,991
Genetic and cellular analysis of glial development and function in vertebrates	93.853				$390,390
Genetic and Immunologic etiology of chronic recurrent multifocal osteomyelitis (CRMO)	93.846	University of Iowa	1001938923		$26,216
Genetic and Molecular Dissection of Pulmonary Neuroendocrine (NE) Cell Development	93.838				$155,743
Genetic and Physical Basis of Mechanical Neuroprotection	93.853				$95,735
Genetic and Stem Cell Model of Cardiac Metabolic Disease	93.837				$132,874
Genetic Control of Neural Stem Cell Homeostasis	93.853				$394,204
Genetic Disorder of Mucociliary Clearance	93.RD	The University of North Carolina at Chapel Hill	5111620		$24,075
Genetic Mechanisms of Congenital Heart Disease	93.837				$300,193
Genetic Mechanisms of Myelination in Zebrafish	93.853				$130,477
Genetic Predictors of Ameloblastoma Behavior	93.121			$29,537	$502,970
Genetic Recombination in C. elegans	93.859				$104,607
Genetic Regulation of Cochlear Development	93.173	Baylor College of Medicine	700000816		$32,412
Genetic Regulation of Gene Expression and its Impact on Phenotypes Supplement	93.310				($8,286)
Genetic risks for cardiovascular events in ESRD patients from the EVOLVE study	93.847	Indiana University	IN-4687724-STAN, PO# 1543801		($18,764)
Genetic testing, treatment use, and mortality after diagnosis of breast and ovarian cancer: The Georgia-California GeneLINK Initiative	93.393			$347,009	$427,850
Genetic variation, stress, and functional outcomes after stroke rehabilitation	93.361	University of California, Irvine	2018-3657		$4,855
Genetically encoded photoswitchable antibody mimetic proteins for spatiotemporal control of molecular recognition	93.859				$14,406
Genetics and Developmental Biology Training Program	93.859				$565,651
Genetics of Hypoplastic Left Heart Syndrome and Aortic Valve Disease	93.RD	J. David Gladstone Institutes	R02177-B		$58,479
Genetics of Prostate Cancer in Africa	93.393	Dana-Farber Cancer Institute (489)	1242104 1242103-3	$103,225	$220,587
Genetics of Severe Mental Illness	93.242	University of California, Los Angeles	2000 G VF036		$22,672
Genome Editing by Homologous Recombination to Create HIV Resistant Immune System	93.855				$471,645
Genome Editing of Human iPSCs to Study Inherited Hypertrophic Cardiomyopathy	93.837				$9,587
Genome Editing to rescue FOXP3 Deficiency in IPEX syndrome	93.855				$24,466
Genome Wide Association Study (GWAS) in Hepatocellular Carcinoma (HCC)	93.393	University of Texas MD Anderson Cancer Center	3001216081		$12,434
Genome wide identification and functional analysis of chromatin regulatory RNAs	93.172				$796,645
Genome-Wide Association Study of Mammographic Density	93.393	Mt. Sinai School of Medicine	0255-1251-4609		$25,724
Genomic and Cellular Variation from Single Molecules and Cells	93.172	University Of Pennsylvania	P.O. #3996602 572789 PO 4191700		$159,153
Genomic and epigenomic effects of large CNV in neurons from iPSC	93.242				($2,236)
Genomic and Morphologic Predictor of High-Risk DCIS	93.393			$107,255	$728,578
Genomic and synthetic biology tools for expressing natural product gene clusters	93.859			$371,163	$1,394,426
Genomic Database for Candida Albicans	93.121				$410,819
Genomic Evolution of Breast Cancer	93.393			$9,409	$387,588
Genomic mosaicism in developing human brain	93.242	Yale University	GK000029(CON-80000297)		$4,127
Genomic Resource for the Yeast Saccharomyces	93.172			$267,002	$2,905,542

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Genomics of Gene Regulation in Progenitor to Differentiated Keratinocytes	93.172				$26
Genomics of rapid adaptation in the lab and in the wild	93.859				$961,362
Germline and Tumor Genomic Analyses of Breast Cancer in Latinas	93.393	Beckman Research Institute Of The City Of Hope	PO#3000125989		$10,252
Get moving, GET living: Graded exposure treatment for adolescents with chronic musculoskeletal pain.	93.846				$188,547
Giant MagnetoResistive (GMR) Sensors for Measuring Influenza Vaccine	93.855				$1,064,927
Glioma Circuitry: Bridging Systems Neuroscience and Cancer	93.310				$1,020,168
Global Health Fellows and Scholars Research Training - Mentoring Fellowship Supplement	93.989	University of California, Berkeley	1004516-100-EAFTR		$9,205
Global Health Fellows and Scholars Research Training - Mentoring Fellowship Supplement	93.RD	University of California, Berkeley	Subaward 00009518 BB01006362	$64,004	$101,509
Glycine receptor synaptic plasticity	93.853				$271,043
Glycosylation and Immune Evasion in Urologic Tumors	93.394				$89,946
Goal of Open Lung Ventilation in Donors	93.838	Vanderbilt University Medical Center	VUMC44300 / R01HL126176 VUMC 44300		$21,674
Graduate Training in Stem Cell Biology and Regenerative Medicine	93.859				$377,039
Graduate Training Program in Biotechnology	93.859				$262,854
Guanidinium Toxins as Molecular Probes for NaV Study	93.859				$340,251
Harnessing human dendritic cell subsets for the design of novel immunotherapies	93.310				$348,967
Harnessing Mindset in 21st Century Healthcare	93.213				$410,634
Harnessing the innate immunotransmitter cGAMP for anti-cancer therapy	93.398				$19,002
Harnessing the Unique Biogenesis of the Apicomplexan plastid organelle for Antimalarial Targets	93.855				$61,214
HEAL Study (High-dose Erythropoietin for Asphyxia and Encephalopathy)	93.853	University of California, San Francisco	9681sc		$28,730
HEAL-EEG - Neurophysiologic measures of Epo treatment for hypoxic-ischemic encephalopathy (HIE)	93.853	University of California, San Francisco	11027sc		$13,945
HEAL-EEG-Neurophysiologic measures of Epo treatment for hypoxic-ischemic encephalopathy (HIE)	93.853	University of California, San Francisco	11099sc		$52,771
Hedgehog signaling in taste cell maintenance and regeneration	93.173				$365,517
Hemophilia Treatment Centers (SPRANS)	93.110	Center for Inherited Blood Disorders (CIBD)	CIBDIX2012HRSA-STAN-5, -STAN-07, -STAN-08		$35,007
Heparanase and Regulatory T cell Stability and Function	93.855				$210,388
Hepatic Gene Transfer for Treatment of Hemophilias A & B	93.839				$520,969
HER2-targeted exosomal delivery of therapeutic mRNA for enzyme pro-drug therapy	93.310				$265,327
HIF-1 mediated vascular integrity limits Aspergillus invasion in airway rejection	93.838				$160,711
High dose efficiency CT System	93.286			$344,510	$449,143
High Performance Scintillator for Radioluminescence Microscopy	93.859	Radiation Monitoring Devices, Inc.	Contract C16-32		($2,649)
High resolution imaging of genome structure and gene regulation in development	93.859				$248,018
High School Program in Biomedical and Health Sciences	93.847				$174,107
High Sensitivity Flow Imaging of the Human Placenta with Coherence-Based Doppler Ultrasound	93.865			$65,476	$500,419
High Sensitivity Molecular Ultrasound Imaging in Pancreatic Cancer	93.286				($7,988)
High throughput screening to identify compounds against Entamoeba cysts	93.855				$91,786
High Value Healthcare Collaborative: Engaging Patients to Meet the Triple Aim	93.172	University of Iowa	PO # 1001701389		($488)
High-Bandwidth Wireless Interface for Continuous Human Intracortical Recording	93.853	Massachusetts General Hospital	227057		$89,601
High-end X-ray Detector System for Femtosecond Crystallography	93.351				$690,400
Highly Reactive Hydrazone Chemistry: Orthogonal Modification in Cellular Contexts	93.859			$15,559	$49,597
High-Resolution Imaging of Hippocampal Mechanisms in Age-Related Memory Decline	93.866				$330,776
High-resolution modeling of protein-RNA interfaces	93.859	The Fred Hutchinson Cancer Research Center	920028		$317,355
High-throughput dissection of HIV RNA ligand affinity and specificity	93.859	University of Michigan	Sub3004919095,P.O.30 05271391		$98,360
High-throughput nano-electrode array system for cardiac safety assessment	93.286	Cyion Technologies	CT2017-002		$48,622
High-throughput precision genome editing to characterize natural genetic variants	93.859				$21,151
High-throughput radionuclide counting and sorting of single cells	93.396				$54,913
High-Throughput Screens to Discover Novel Inhibitors of Leaky RyR2 for Heart Failure Therapy	93.837	University Of Minnesota	N006353702		$256,723
High-throughput systematic characterization of regulatory element function	93.172				$1,459,051
HIPC: System Biological Analyses of Innate and Adaptive Responses to Vaccination - Core A	93.855	Emory University	A016254A198103		$206,176
HIPC: System Biological Analyses of Innate and Adaptive Responses to Vaccination-Proj#1	93.855	Emory University	A016268 A198127		$1,591,251
hiPSC-Cardiomyocytes to Screen Variants Predictive of Doxorubicin Cardiotoxicity	93.837			$157,267	$469,958
Hi-resolution dynamic imaging of chromosomes in single cells by combined CRISPR imaging and sequential FISH	93.310	California Institute of Technology	S386839 / U01 DA047732		$197,850
HIV Drug Resistance Database	93.855				$752,669
HIV latency reversal through novel, potent PKC modulators	93.855	University of California, Los Angeles	2301 G UC641		$217,209
HIV Resistance Testing Using Point-of-Care Dynamic Solid-Phase Melt Analysis	93.855				$233,547
HIV Vpr, CRL4.DCAF1 E3 ligase and their targets	93.859	Case Western Reserve University	RES512573		$6,579

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Home Use of MD-Logic Automated Insulin Delivery System: Safety and Efficacy	93.847	HealthPartners Institute	852223-Stanford X1509000-Stanford		$15,060
Homologous Recombination Mediated Gene Correction for the Hemoglobinopathies	93.839				$484,551
Hospital Variation in Costs and Outcomes of Care for Childbirth	93.226	Yale University	GK000663 (CON-80000411)		$29,522
Host Determinants of Adeno-Associated Virus Entry and Trafficking	93.855				$455,095
Host Genes Critical for Flavivirus Infection	93.855				$305,376
Host-virus interactions in the control of the filovirus entry	93.RD	Albert Einstein College of Medicine	P0 706802		$18,581
How is anxiety-related information relayed across hippocampal-prefrontal circuits	93.242	University of California, San Francisco	10948sc		$107,714
How Social Behavior Changes The Brain	93.853				$23,290
Human Connectome Mapping Using Ultra-High-Resolution MRI: A Technological Pathway	93.286				$39,090
Human Induced Pluripotent Stem Cells for Cardiovascular Disease Modeling	93.837				$529,248
Human Infrared Vision at Molecular and Cellular Scale	93.853				$822,002
Human Population Diversity in Leukocyte Receptors	93.855			$21,684	$403,626
Human Tumor Atlas Network: Data Coordinating Center	93.353	Dana-Farber Cancer Institute (489)	1288401		$5,273
Hydrocortisone for BPD Respiratory and Development Outcomes Study (HYBRID Outcomes Study): Clinical Coordinating Center	93.838	Children's Hospital of Philadelphia	3200930818,PO962765-RSUB 3200930819;PO20022092-RSUB		$19,738
Hydrogels with Controlled Degradation and Stress Relaxation for Engineered Cartilage	93.846				$211,674
Hyposalivation and the Human Oral Microbiome	93.121	Palo Alto Veterans Institute for Research	REL0027-02		$43,341
Hypoxia induces SHMT2 to regulate cellular redox and epigenetics	93.396				$278,940
Ictogenesis in a model of temporal lobe epilepsy	93.853				$363,254
Identification and characterization of natural products from the human microbiota	93.847				$287,583
Identification and characterization of oxygen-sensing neurons in the lung	93.838				$36,370
Identification of a novel pathway that regulates optic nerve myelination and remyelination	93.867				$90,614
Identification of cancer stem cell therapeutic targets	93.396				($185)
Identification of causal coronary heart disease variation in smooth muscle cells	93.837				$259,433
Identification of cells and signaling mechanisms underlying opioid analgesia and side effects	93.279				$546,321
Identification of Cooperative Genetic Alterations in the Pathogenesis of Oral Cancer	93.121				$420,341
Identification of RDoC Social Communication Sub-Constructs Using Existing Datasets	93.242				$76,126
Identification of therapeutic target miRNAs involved in altered calcium handling in familial dilated cardiomyopathy	93.837				$4,920
Identification, standardization and dissemination of the HIPC immune signatures	93.855	Icahn School of Medicine at Mount Sinai	0255-8673-4609-1		$62,800
Identifying a Systemic Immune Signature of Periodontal Disease with Mass Cytometry	93.121				$191,252
Identifying causal dynamical motifs of anhedonia with circuit-level tools	93.242				$601,721
Identifying Components of the Rhoptry Protein Injection Machinery Toxoplasma gondii	93.855				$30,226
Identifying critical erythrocyte host factors for Plasmodium falciparum malaria	93.839				$460,948
Identifying Markers of Induced Pluripotent Stem Cell-Derived Cardiomyocyte (iPSC-CM) Maturity	93.837				$35,999
Identifying niche factors regulating distinct properties of AT2 stem cells	93.838				$562,634
Identifying Patterns of Cognitive, Motor, and Brain Structural Abnormalities Differentiating Alcohol Use Disorder with and without HIV Infection Comorbidity	93.273				$66,950
Identifying the gene networks of insulin resistance: the GENESIPS study	93.837				$1,177
Identifying the Genetic Etiology of Neuropathology for Alzheimer Disease and Related Dementias	93.866	University of Miami	SPC-001127		$8,852
Identifying the Human Calcineurin Signaling Network	93.859				$517,062
Identifying the human skeletal stem cell	93.121				$338,709
Identifying The Machinery That Translocates Toxoplasma Effectors Into The Host Cell	93.855				$439,095
Image-guided ultrasound therapy and drug delivery in pancreatic cancer	93.394			$77,587	$623,179
Imaging and circulating DNA markers to assess early response and predict treatment failure patterns in lung cancer	93.394				$157,011
Imaging and Regulation of Immune Function in HCT	93.394				$405,959
Imaging Brain Metabolism Using MRS of Hyperpolarized 13C-Pyruvate	93.286				$429,838
Imaging Collaterals in Acute Stroke (iCAS)	93.853				$578,247
Imaging of mitochondrial function of progenitor cells transplanted to the ischemic myocardium	93.837	Mayo Clinic	STA-213113-04; PO# 66647785		$55,137
Imaging the behaviorally evoked neural ensemble dynamics of the locus coeruleus in healthy and addicted brains	93.279				$53,969
Imaging the temperature sensing circuits in the spinal cord	93.853				$266,410
Immune Checkpoint inhibitors as Antifibrotic Therapy for Idiopathic Pulmonary Fibrosis	93.838				$163,954
Immune Monitoring and Analysis of Cancer at Stanford (IMACS)	93.353				$2,586,938
Immune profiling of saliva in pancreatic diseases	93.847	Mayo Clinic Hospital-Rochester	BOA-229500/PO #66251884		$21,128
Immune targeting of Non-Hodgkin Lymphoma through integrative Antigen Presentation Profiling	93.398				$187,526
Immune Tolerance Network	93.855	Benaroya Research Institute at Virginia Mason	FY19ITN257 FY18ITN257 FY17ITN006 FY18ITN006		$2,182

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Immunization against filamentous bacteriophages to prevent bacterial infection	93.855	University of Montana	PG18-61062-02		$211,542
Immunogenetic Determinants of Disease Risk in Neurological Disease	93.853	University of California, San Francisco	9047sc		$374,415
Impact and outcomes of cataract surgery among patients with Alzheimer's Disease	93.866				$93,617
Impact of Affect Reactivity and Regulation on Breast Cancer Treatment Decisions	93.393				$636,903
Impact of Diet on Intestinal Microbiota-Host Dynamics	93.847				$455,476
Impact of HIV exposure, feeding status, and microbiome on immune ontogeny and vaccine responses in infants	93.855			$221,353	$384,051
Impact of Recurrent Seizures upon Myelin Structure and Function	93.853	Kennedy Krieger Institute	1K12NS098482-02		$160,288
Impact of Retail Tobacco Advertising on Youth Smoking	93.393			$33,807	$202,381
Impact of sleep-wake circuits on cortical synapse plasticity during motor learning	93.853			$105,905	$503,728
Impact of standardized communication on human performance during resuscitation	93.226				$134,036
Implementation of evidence-based treatment for on-campus eating disorders	93.242	Washington University	WU-12-284-MOD-9/PO # 2917864T		$33,448
Improve PAD PERformance with METformin: The PERMET Trial	93.837	Northwestern University	60045563 SU 60045563SU / R01HL131771		$18,830
Improving Cognition via Exercise in Schizophrenia	93.242	Icahn School of Medicine at Mount Sinai	0255-3351-4609		$142,147
Improving Quality of postoperative pain care through innovative use of electronic health records	93.226				$198,583
Improving the Efficiency and Rigor of Pharmacovigilance at FDA	93.RD				$11,913
Improving Tissue Engineered Vascular Graft Performance via Computational Modeling	93.837	The Research Institute at Nationwide Children's Hospital	700151-1118-00; PO4601124-0-46 700151-0219-00		$238,535
In Situ Bioconjugation as a Therapeutic Delivery Modality to Enhance Ocular Wound Healing	93.867				$253,759
In situ simulation of neonatal resuscitation to improve team performance and clinical outcomes	93.865			$13,155	$459,188
In Vivo Control and Functional Visualization of Stem Cell-Driven CNS Regeneration	93.310				$132
In vivo PET imaging of novel engineered AAVs informs capsid design	93.RD				$40,699
In Vivo Polarity Establishment and Symmetry Breaking in an Epithelial Tissue	93.859				$33,151
In vivo targeting of diabetes-relevant human cell types with rAAV vectors	93.847	Oregon Health & Science University	1005254_STANFORD		$255,994
INCLUDE19-Human iPSC Model for Elucidating Crosstalk Signaling and Secretomes: Down Syndrome Administrative Supplement	93.837				$628,784
IND-enabling studies on novel Cav3 T-channel modulators for treatment of neuropathic pain	93.853	Afasci Inc.	130486		$53,378
Induced host immune response to HIV-1 after antibody therapy	93.855				$126,036
Induced neuronal cells: A novel tool to study neuropsychiatric diseases	93.242				$619,325
Infant Aphakia Treatment Study-Chairman's Grant	93.867				$147,422
Infectious Diseases, Technology and Mortality Convergence	93.865				($2)
Inferring the roots of metastases and their effects on patient survival	93.398				$134,283
Influence of genetic risk factors on biomarkers and cognitive decline in preclinical AD	93.866				$155,407
Influenza responses and repertoire in vaccination, infection and tonsil organoids	93.855			$1,013,809	$4,245,070
Informatics Tools For Optimized Imaging Biomarkers For Cancer Research & Discovery	93.394	Massachusetts General Hospital	224943		$140,773
Inhibitory Controls in the Thalamic Neurons	93.853				$585,955
Inhibitory synaptic transmission, stress, and drugs of abuse	93.279				$51,966
Initiate and Maintain Physical Activity in Clinics: The IMPACT Diabetes Study	93.847			$57,264	$787,737
Injectable Hydrogels to Improve the Efficacy of iPSC-derived Therapies	93.286			$4,061	$4,061
Injectable Hydrogels to Protect Transplanted Cells from Hypoxia	93.286				$127,664
Injectable Macroporous Matrices to Enhance Stem Cell Survival and Craniofacial Repair	93.121				$17,907
Innovating Yeast and Human Genetics Approaches to Define Mechanisms of Neurodegenerative Disease	93.853				$744,130
Innovations in an Aging Society	93.RD	National Bureau of Economic Research	33-4051-Stanford		$20,001
Innovative Physical Activity Interventions for Overweight Latinos	93.847				$15,072
Insights into immune-related disease born from population genomics	93.855			$44,947	$717,798
Insonation of ultrasound microbubbles at low frequency to enhance image-guided therapy	93.394				$418,746
Instant Stem Cell Labeling with a new Microfluidic Device	93.846				$1,622
Institutional Training Grant in Genome Science	93.172				$1,335,170
Instructive Signals for Motor Learning	93.853				$524,226
Insulin Resistance and Accelerated Cognitive Aging	93.866			$69,121	$635,041
Integral determination of pre and post treatment of EBV DNA in EBV+ nasopharyngeal carcinoma for risk group stratification for RTOG 1305	93.RD	Radiation Therapy Oncology Group	RTOG - STANFORD - SOW#1		$227,057
Integrated Clinical and Transcriptomic Profiling to Characterize Disease Phenotype	93.172				$180,850
Integrated genomic analysis and multi-scale modeling of therapeutic resistance	93.395			$36,208	$549,505
Integrated Genomic and Functional Studies of Immunotherapy for Multi-Food Allergy	93.855				$825,823
Integrated Instrument for non-natural aptamer generation	93.859				$295,301
Integrated Microbial Screening and Antimicrobial Susceptibility Test on Microfluidic Digital Array for Diagnosis of Urinary Tract Infections	93.855	COMBiNATi	1 R41 AI145604-01		$17,996
Integrated Personalized Epigenome Profiling and the Effect of Dietary Exposure on Individuals at Risk for Type-2-Diabetes	93.847				$3,328
Integrated Systemic and Adipose Depot-Specific Regulation of Adipogenesis	93.847				$45,194

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Integrated, cell type specific functional genomics analyses of regulatory sequence elements and their dynamic interaction networks in neuropsychiatric brain tissues	93.242				$178,885
Integrating Combined Therapies for Persons with Co-occurring Disorders	93.273				($12)
Integrating Ethics into Machine Learning for Precision Medicine	93.172				$20,037
Integrating literature and experimental data for druggability methods	93.879				$468
Integrating Technology and Context into Research Ethics Education in ACME	93.989			$102,000	$129,723
Integrating the Exposome into Longitudinal Multiomics Profiling	93.113				$97,330
Integration of Diffusion MRI Fiber Tracking and CLARITY 3D Histology for Improved Neurosurgical Targeting	93.853				$296,096
Integration of functional data and GWAS to elucidate genetic basis of diseases	93.172			$685,159	$835,452
Integration of Microbe and Host Data for Diagnosis of Febrile Illness	93.855	Columbia University	2(GG008377-39)		$425,303
Integration of regulatory networks and subcellular architecture to control the Caulobacter cell cycle	93.859				$645,278
Integrative approaches to elucidate p53 transcriptional networks during carcinogenesis	93.393				$952,075
Integrative genomics for risk of CHD and related phenotypes in the Womens Health Initiative	93.RD				($733)
Integrative Molecular and Phenotype Analysis of 22q11.2 Deletion Syndrome	93.242			$55,899	$62,397
Integrative multi-omics in whole genome studies of HLBS disorders	93.837				$338,506
Integrative Omics as a Discovery Tool for Pulmonary Hypertension	93.837			$211,678	$440,915
Interaction of Visual and Oculomotor Signals in Cortex	93.867				$445,783
Interactions between goals, attention, and memory in younger and older adults	93.866				$55,143
Interactions of PTH and Wnt Signaling in Bone Formation	93.846				$75,992
Interdisciplinary Research Training in Pain and Substance Use Disorders	93.279				$357,329
Internal Tissue Mechanics and the Sense of Touch in C. elegans	93.853				$42,854
International Research Collaboration on Neuroimaging Studies of Alcoholism	93.273			$24,120	$290,744
Interneuron-Based Mechanisms of Temporal Lobe Epilepsy	93.853				$236,676
Interpregnancy Intervals and Pregnancy Outcomes in California	93.865				$117,172
Interrogation of individual cells to identify progenitors and their niches	93.837				($67)
Interrogation of individual cells to identify progenitors cells and their niches	93.837				($267)
Interrogation of network-wide neuronal dynamics during fear memory in mouse default mode network	93.242				$105,432
Interrogation of the ISC Niche in Regenerative Medicine	93.847				$449,312
Interrogation of voltage gated sodium channel specialization using synthetic saxitoxin	93.853				$231,290
Interventions in Math Learning Disabilities: Cognitive and Neural Correlates	93.865				$404,087
Intestinal Stem Cell Culture and Entero-Endocrine Lineage Development.	93.RD	University of California, Los Angeles	1646 G UA236		$10,000
Intracellular Calcium Signaling	93.859				$96,422
Intracellular Transport: The Mannose Phosphate Receptor	93.847				$264,785
Intracranial EEG and Electrical Stimulation of Deactivations in the Human Brain	93.865				$29,922
Intranasal vasopressin treatment in children with autism	93.865				$634,806
Intra-procedure Deformable Ultrasound-MRI Fusion for Prostate Biopsies	93.394	Eigen	SPO123219		$7,498
Investigating a fluorogenic DMN-trehalose conjugate as a novel detection tool for Mycobacterium tuberculosis	93.855				$21,558
Investigating how signaling via adhesion GPCR Latrophilins regulates synapse formation and specificity in the hippocampus	93.242				$126,086
Investigating the Hypocretin to VTA Circuit in Memory Consolidation during Sleep	93.242				$59,450
Investigating the neural mechanism of essential tremor using a novel mouse model	93.853				$123,811
Investigating the physical mechanisms that drive multicellular lumen morphogenesis	93.859				$55,902
Investigating the Role of Dach1 in Artery Specification and Collateral Artery Development	93.837				$11,569
Investigating the Role of Metabolic Reprogramming in Cancer Cell Death Sensitivity	93.393				$36,865
Investigating the role of TCF4 in human interneuron function and dysfunction	93.242				$24,992
Investigating the Role of the Mek5-Erk5 Kinase Module in Small Cell Lung Cancer	93.398				$7,451
Investigation of the role of Turner syndrome on approximate number sense	93.865				$116,952
Investigations of racial and geographic disparities experienced throughout work life: Evidence from a longitudinal occupational cohort study	93.866			$307,445	$837,481
Involving older adults in decision making for skin cancer	93.866				$94,247
Ion Channels and Signaling Mechanisms in T Lymphocytes	93.859				$458,623
Iron as an Imaging Biomarker for Inflammation in AD	93.866				$256,130
Irradiated head and neck cancer soft tissue reconstruction by fat transfer	93.121				$255,865
ISCHEMIA	93.837	Duke Clinical Research Institute	203-7684 A03-9008 A03-1953		$20,925
ISCHEMIA TRIAL	93.837	New York University	26-C-10500-NYUPG-100422 1001073/26C10500NYUPG100422		$181,918
ITN087AD Anti-IL33 Study	93.855	Benaroya Research Institute at Virginia Mason	FY19ITN313		$45,793
Language connectivity pathways and neuroplasticity in aphasic stroke patients	93.173			$104,889	$159,188

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Large aperture and wideband modular ultrasound arrays for the diagnosis of liver cancer	93.394			$304,792	$755,541
Large-Scale Characterization of Autoantibody Responses in Rheumatoid Arthritis	93.846				$148,187
Large-scale dual-color two-photon calcium imaging in awake behaving animals	93.853				$119,478
Large-scale functional validation of candidate transcripts emerging from GWAS and exome sequencing studies	93.847	Broad Institute, Inc.	5216279-5500001193		$180,247
Large-Scale Patterned Electrical Stimulation for Design of Retinal Prostheses	93.867			$78,631	$412,735
Lateral hypothalamic regulation of male and female sexual motivation	93.865				$29,684
Learning and brain plasticity in children with autism: relation to cognitive inflexibility and restricted-repetitive behaviors	93.242				$932,497
Learning Regulatory Drivers of Chromatin and Expression Dynamics during Nuclear Reprogramming	93.172				$806,779
Leveraging Routine Clinical Materials and Mobile Technology to Assess CBT Quality	93.242	Palo Alto Veterans Institute for Research	WIS0003-03		$12,859
Leveraging spectral encoding for high dimensional biological multiplexing	93.310				$602,438
Liberation of Plant Nutrients by the Gut Microbiota	93.310				$9,727
Life course contexts and work: quantifying impacts on aging and chronic disease	93.866				$75,668
Ligand-Receptor Dynamics and Cellular Responses Studied In Situ Using Venturi Easy Ambient Sonic-Spray Ionization Mass Spectrometry	93.242				$86,513
Lightsheet Microscope for Large-Scale Imaging of Cleared Tissue Samples	93.351				$330,125
Limbic Circuit Dysfunction in Offspring following Maternal Immune Activation	93.242				$59,630
Link between epigenetic modifiers and fat metabolism for healthy aging	93.866			$159,924	$334,674
Linking emotion, motivation and action with amygdalo-nigro-striatal circuits	93.242				$111,548
Linking Islet Cell Function and Identity from in vitro to in situ	93.847	University of Alberta	RES0041098-S001		$188,685
Listening to Mom in the NICU: Neural, Clinical and Language Outcomes	93.865				$27,107
LncRNA mechanisms in cancer	93.393				$938,576
LncRNA Regulators of Epidermal Homeostasis and Early Neoplasia	93.846				$65,917
LncRNA Transcriptional Mechanisms of Coronary Artery Disease Risk	93.837				$48,859
Longitudinal investigations of the infant virome and its associations with obesity	93.865			$394,369	$799,450
Longitudinal multi-omic profiles to reveal mechanisms of obesity-mediated insulin resistance	93.847				$579,622
Longitudinal Multiomics Microbial Profiling in Healthy and Disease Individuals	93.310				($249)
Longitudinal Neurocognitive Studies of Mathematical Disabilities: trajectories and outcomes	93.865				$643,234
Long-term metabolic effects of kidney events with intensive SBP control	93.847	University of Utah	Sub 10047597-01 PO #U000165213		$16,010
Long-term sequelae of early life pesticide exposure in the CHAMACOS birth cohort	93.310	University of California, Berkeley	00009395/BB00862228		($13,573)
Long-term trajectories of subjectively- and polysomnographically-assessed sleep patterns as predictors of neuroendocrine dysregulation and weight gain in adults	93.233	Utah State University	200979-414		$202,450
Low InTensity Exercise intervention for peripheral artery disease: The LITE Trial	93.837	Northwestern University	60039432 LESTAN		$11,779
Lung cancer in never smokers: incidence, risk factors, and molecular characteristics in Asian American, Native Hawaiian, and Pacific Islander women	93.393	University of California, San Francisco	10551sc		$10,070
Lymph Node Extracellular Matrix in Antigen Presentation and Immune Regulation	93.847			$162,741	$435,918
Machine learning to distinguish HAND from Alzheimer's disease in HIV over age 60	93.242	University of California, San Francisco	11254sc		$48,619
MACRA Episode Groups and Resource Use Measures	93.RD	Acumen, LLC.	MIDS-2013-13002I-T0002		$271,764
Macrophage phenotype polarization in clinical neoplasia	93.396				$539,138
Magnetic resonance Imaging as a Non-Invasive Method for Assessment of Pancreatic fibrosis (MINIMAP): a pilot study	93.847	Indiana University	IN-4687972-LSJU: PO# 2314322		$39,446
Mailed FIT Program to Improve Colorectal Cancer Screening in the San Francisco Safety-Net System	93.135	University of California, San Francisco	8427sc		$6,696
Making Better Decisions: Policy Modeling for AIDS and Drug Abuse	93.279			$128,201	$340,043
Making glycoproteomics via mass spectrometry more accessible to the greater scientific community	93.394				$596,689
Making the HIV-1 gp41 pocket amenable to small-molecule drug discovery	93.279				$1,208,672
Malaria Evolution in South Asia	93.855	University Of Washington	UWSC9949/ BPO 30664		$66,075
Management of Hypertension among Persons with and without Dementia in Long-Term Care	93.866				$21,137
Mapping and Manipulating Circuits for Emotion and Cognition in Anxiety and Depression	93.242				$94,757
Mapping chromatin secondary structure by sequencing correlated DNA strand breaks	93.172				$258
Mapping connectomes for disordered emotional states	93.242				$971,126
Mapping Protein Communication Between Organs in Homeostasis and Disease	93.847	Harvard University	153277.5107753.0004		$131,469
Mapping the CPLANE interactome, an extensive protein interaction network underlying human ciliopathies	93.865	University of Texas at Austin	UTA16-001173		$145,474
Marfan Aortic Embryologic Origin Influences miR-29b Regulators and Targets	93.846				$461,931
Massively parallel microwire arrays for deep brain stimulation	93.853				$101,084
Maternal Chronic Pain: Risk for Pain and Poor Outcomes in Children	93.865	Oregon Health & Science University	1006408_Stanford		$156,638
Maternal Health after Stillbirth: An Investigation of Postpartum Hospital Readmission in California	93.865				$74,796

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Maternal Outcomes and Neurodevelopmental Effects of Antiepileptic Drugs (MONEAD)	93.853	Emory University	T473240 / T662124		($37)
Maternal Outcomes and Neurodevelopmental Effects of Antiepileptic Drugs (MONEAD)	93.853			$2,418,454	$3,131,506
Mathematical and Computational Analysis for Inference of Species Trees	93.859	University of Alaska Fairbanks	UAF 16-0023 / PO: P0496538		$63,862
Measuring and Modulating Oxidative DNA Damage Surveillance Pathways	93.396				$357,713
Measuring Infant Pain Objectively using Sensor Fusion and Machine Learning Algorithms	93.279	Autonomous Healthcare, Inc.	1R41DA046983-01-S1		$67,791
Measuring isoform signaling in single breast cancer cells	93.394	University of California, Berkeley	00009076/BB00659697/ R01CA20318		$34,749
Mechanical circulatory support: Measures of adjustment and quality of life	93.837	Northwestern University	60043010 TLSJU		$61,521
Mechanism of the coronary heart disease association at chromosome 6q23.2	93.837				$694,854
Mechanism of the Eukaryotic Chaperonin TRiC/CCT	93.859				$322,757
Mechanism-based therapies for photoreceptor degeneration	93.867			$82,603	$340,286
Mechanisms and Consequences of Defective Flow-Induced Potassium Secretion in the Metabolic Syndrome	93.847				$222,082
Mechanisms and Innovation in Vascular Disease	93.837				$355,311
Mechanisms and targeting of SWI/SNF alterations in pancreatic cancer	93.393				$239,491
Mechanisms controlling microtubule organization during cell differentiation	93.310				$592,059
Mechanisms of Action of the Smyd3 Methyltransferase in Cancer Cells	93.396				$34,168
Mechanisms of Age-Related Microglial Impairment and Rejuvenation in Alzheimer's Disease	93.866				$39,719
Mechanisms of Aging in C. Elegans	93.866				$97,024
MECHANISMS OF CHROMATIN REMODELING DURING EPITHELIAL DEVELOPMENT	93.846				$33,991
Mechanisms of CLC Transporters and Channels	93.859			$132,467	$404,324
Mechanisms of Diet-Induced Pathogen Expansion in the Gut	93.855				$348,746
Mechanisms of enhancer activation in early development	93.859				$322,116
Mechanisms of Kinetochore Assembly	93.859				$50,546
Mechanisms of lncRNA-mediated control of epidermal proliferation and differentiation	93.846				$60,686
Mechanisms of NAT2 Regulation of Insulin Resistance and Mitochondrial Dysfunction	93.RD				$11,895
Mechanisms of persistent Salmonella infection	93.855				$179,702
Mechanisms of restriction point response to dynamic growth factor signals	93.859				$211,659
Mechanisms of Skeletal Stem Cell Aging	93.866				$221,505
Mechanisms of Synaptic Specificity in C. elegans	93.853				$411,291
Mechanisms regulating immunity to dengue viruses	93.855	The Rockefeller University	2U19AI111825-06		$34,579
Mechanisms underlying radiation and chemotherapy induced cognitive impairment	93.853	University of California, Irvine	2016-3313		$68,560
Mechanisms, Prevention and Treatment of Chronic Graft-vs.-Host Disease - Project 1	93.395	Dana-Farber Cancer Institute (489)	1153413		$17,135
Mechanisms, Prevention and Treatment of Chronic Graft-vs.-Host Disease - Project 1	93.395	Dana-Farber Cancer Institute (489)	1153414		$39,445
Mechanisms, Prevention and Treatment of Chronic GVHD - Project 3	93.395	Dana-Farber Cancer Institute (489)	1272413 1272414		$25,951
Mechanistic basis of allogeneic IgG-induced tumor eradication	93.398				$6,156
Mechanistic Studies on Regenerative Medicine Approaches to Childhood Blindness	93.867	University of Iowa	1001925001		$51,406
Mechanistic studies to assess the effect of omalizumab on immune cells in conjunction with randomized, controlled rapid multifood OIT (CoFAR11) trial	93.855	The Johns Hopkins University	2004200730		$57,638
Mechanobiology at Healing Bone-Implant Interfaces	93.121			$128,254	$589,234
Mechanotransduction and transcriptional regulation during artery development	93.837				$431,704
Mediators of Systemic Inflammation and Heart Failure Risk in the Community	93.837	Cedars-Sinai Medical Center	1572381		$49,518
Medical Rehabilitation Research Resource P2C	93.865	University of Pittsburgh	0048860 (126874-4)		$97,765
Medical Scientist Training Program	93.859				$1,521,637
Medication Assisted Treatment (MAT) Expansion Project: CA Hub & Spoke System Training and Learning Collaborative	93.788	University of California, Los Angeles	2000-S-VN579		$142,388
Meiotic Chromosome Inheritance in C. elegans	93.859				$568,966
Meiotic Chromosome Segregation in C. Elegans	93.859				($3,279)
Memory T cell development and survival in T cell responses of older individuals	93.855	Palo Alto Veterans Institute for Research	GOR0011-01		$129,181
Mental Health Technology Transfer Center (MHTTC) National Coordinating Center (NCC	93.243			$163,333	$565,414
Mentoring Patient-Oriented Clinical Investigators in Nephrology	93.847				$148,477
Metabolic derangements in ARDS	93.837				$60,050
Metabolic Engineering with Bioorthogonal Chemical Reporters	93.859				$304,781
Metabolic imaging comparisons of patient-derived models of renal cell carcinoma	93.396	University of California, San Francisco	10450sc		$230,870
Metabolic Imaging of Nonalcoholic Fatty Liver Disease	93.847	University of Maryland	1700999/14333/SR0000 4443		$49,773
Metabolic Therapy of GBM guided by MRS of hyperpolarized 13C-pyruvate	93.394				$383,789
Metabolic Underpinnings of AL Amyloid Cardiomyopathy	93.837				$139,892
Metabolomic Profiling of Explanted Pulmonary Arterial Hypertension Lungs	93.838				$55,188
Methods for Dynamic Causal Interactions in Human Brain Function and Dysfunction	93.853				$386,170
Methods for Dynamic Causal Interactions in the Developing Human Brain	93.865				$131,366
Microengineered Osteons for Bone Tissue Engineering	93.846			$14,669	$460,543
Microglial lipid droplets in Alzheimer¿s disease	93.866				$81,726
Microribbon-based Scaffolds for Bone Repair	93.121				$383,591
MicroRNA Control of Dilated Cardiomyopathy	93.837			$51,841	$619,977

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microRNA Regulation of T Cell Senescence	93.855	Palo Alto Veterans Institute for Research	GOR0010-02, PO# GOR053503 GOR0010-03		$74,922
MicroRNA-Dependent Regulation of Synaptic and Behavioral Plasticity in Drosophila	93.853	Harvard University	152738.5095129.0305 152738.5095129.0405		$215,084
microRNAs, non-ion channel proteins and the control of drug-induced arrhythmia	93.837				$43,548
MIND the Kidneys	93.847			$34,795	$193,649
Miniaturized Automated Whole Blood Cellular Analysis System	93.855			$62,072	$368,185
Mining health data for drug safety profiles	93.859				$242,204
miR-152: A Novel Regulator of Diabetic Cardiomyopathy	93.837				$259,249
miR-409-3p controls corticospinal development: therapies for spinal cord injury.	93.853				$182,927
MIRIAD - Multiplexed Imaging of Resilience In Alzheimers Disease	93.866			$83,012	$1,133,839
Mitochondrial inner membrane aritcheture in skeletal muscle pathophysiology	93.846				$39,471
Mitochondrial to nuclear gene transfer via synthetic evolution	93.859			$160,592	$237,052
Mixed NOP/mu Compounds and the Involvement of Their Receptors in Analgesia	93.279	Florida Atlantic University	BR-K99		$96,223
Mixed-Reality Neuronavigation for Transcranial Magnetic Stimulation Treatment of Depression	93.242			$18,077	$260,732
Mobility Data Integration to Insight	93.286				$1,470,439
Modeling and Predicting Therapeutic Resistance of Cancer	93.396				$518,278
Modeling Endothelial Dysfunction in LMNA-related Dilated Cardiomyopathy	93.837				$159,996
Modeling KRAS-Dependent Synthetic Lethality in Human Colon Organoids	93.395			$359,994	$730,083
Modeling Oral Cancer in Primary Organoid Culture	93.121				$11,650
Modeling Susceptibility to Chemotherapy-Induced Cardiotoxicity Using Human iPSCs	93.837			$9,822	$460,296
Modeling the Molecular Determinants of Induced Anti-Tumor Immune Responses in Mantle Cell Lymphoma	93.396				$689,084
Modeling the Role of Lymph Node Metastases in Tumor-Mediated Immunosuppression	93.397				$2,093,582
Modeling Tyrosine Kinase Inhibitor-Induced Vascular Dysfunction Using Human iPSCs	93.837			$7,574	$756,236
Models for Optimal Liver Transplant Outcomes	93.847				($2)
Modulating HSC-niche interactions to understand aging and improve transplantation	93.839				$497,291
Modulating the post-stroke inflammatory response to improve outcome in models of cerebral ischemia	93.853				$353,357
Modulation of gut bacteria-derived host metabolites	93.847				$159,157
Modulation of internal ribosome entry by ribosomal protein RPS25	93.855				$84,940
Modulation of the B cell response to dengue virus infection by Plasmodium falciparum co-infection	93.855				$184,520
Molecular analysis of Tmie in sensory hair cells	93.173				$74,533
Molecular and Cellular Immunobiology	93.855				$1,549,764
Molecular and cellular mechanisms of SCLC metastasis	93.396			$18,685	$404,854
Molecular and functional regeneration of the accessory optic pathway	93.867	The Johns Hopkins University	2003564303		$271,835
Molecular and morphological characterization of mouse and human hair cell regeneration	93.173				$216,391
Molecular and Neural Networks Underlying Social Attachment	93.242			$240,830	$1,016,596
Molecular and single-cell immunology of myalgic encephalomyelitis / chronic fatigue syndrome	93.855				$646,344
Molecular Basis of Host Parasite Interaction	93.855				$443,331
Molecular Basis of Sensory Transduction in C. elegans	93.853				$68,151
Molecular basis of tumor suppression by Cdk4/6 inhibition	93.395	University of California, Santa Cruz	A19-0344-S001-P0700755		$69,816
Molecular Biophysics Training Program at Stanford	93.859				$416,061
Molecular Characterization and Personalized Approaches to Non-Hodgkin Lymphoma from Circulating Tumor DNA	93.398				$11,163
Molecular Characterization of Cardiomyopathy Mutations in Human Cardiac Myosin	93.837	University of Colorado	RHL117138C/1556322/1001023086		$328,663
Molecular Discovery for Optic Nerve Regeneration	93.867			$543,481	$1,076,184
Molecular Dissection of an Arntl2 induced pro-metastatic secretome	93.396				$376,982
Molecular dissection of Lkb1-mediated tumor suppression	93.396				$373,723
Molecular Dissection of Lung Cancer Progression and Metastasis	93.396				$16,475
Molecular dissection of prefrontal cortex circuit architecture	93.242				$147,837
Molecular Genetic Analysis of TORC1 and TORC2 Signaling in Neuronal Maintenance	93.853				$453,779
Molecular images and machine learning to extract placental function from maternal cfDNA	93.865				$607,405
Molecular Imaging Methods for the Detection of Pancreatic Ductal Adenocarcinoma	93.394			$151,326	$697,803
Molecular Imaging of Cardiac Pluripotent Stem Cells	93.837				$359,058
Molecular Imaging of Protein Glycosylation in Living Subjects	93.310				$4,137
Molecular Insights into Membrane Curvature Recognition	93.859	Penn State College of Medicine	STU GM105963		$14,569
Molecular Mechanism and Novel Therapeutic Strategy in Alzheimer's Disease	93.310			$5,805	$495,120
Molecular Mechanism and Regulation of Asynchronous Release	93.242				$105,321
Molecular mechanism of the NKCC transporter	93.847				$37,283
Molecular Mechanisms Controlling Wallerian Degeneration of Axons	93.853				$224,892
Molecular mechanisms of genome maintenance during DNA replication and repair	93.398				$77,112
Molecular mechanisms of Hedgehog receptor function	93.859				$482,412
Molecular Mechanisms of Inflammasome Activation During Salmonella Infections	93.855				$341,182
Molecular Mechanisms of Insulin Resistance Associated Loci	93.847				$544,440
Molecular Mechanisms of Physiologic Beta Cell Growth in Juvenile Human Pancreas	93.847	Vanderbilt University Medical Center	VUMC53356		$192,465

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Molecular mechanisms of SCLC initiation and detection in mice and humans	93.393				$564,745
Molecular mechanisms of Wnt and mechanical signaling through ß-catenin	93.859				$17,748
Molecular Mechanisms of Wnt Signal Transduction	93.859				$321,939
Molecular Mechanisms Regulating Inhibitory Circuitry in the Spinal Cord	93.853				$227,108
Molecular mechanisms that regulate target cell sensitivity to Hedgehog morphogens	93.859				$24,503
Molecular mechanisms underlying flow sensing in lymphatic endothehial cells	93.837				$331,878
Molecular mechanisms underlying force sensing at intercellular junctions	93.859				$405,479
Molecular mechanisms underlying force transduction at cellular adhesion complexes	93.859				$25,846
Molecular Neurobiology of Drug Addiction	93.279	Mt. Sinai School of Medicine	0254-7660-4609		$181,494
Molecular pathoepidemiology of contralateral breast cancer	93.393	Memorial Sloan-Kettering Cancer Center	BD523921		$206,594
Molecular pathoepidemiology of contralateral breast cancer	93.393	The Fred Hutchinson Cancer Research Center	0000937379 PR#218920 Subaward 0000996528		$8,972
Molecular Pharmacology Training Grant	93.859				$221,596
Molecular Phenotyping in Alzheimer's Disease	93.866			$583,733	$903,322
Molecular Regulation of Stem Cell Aging	93.866	Baylor College of Medicine	7000000497 1163038-100-EHAUC		$131,820
Molecular Regulation of Stem Cell Aging	93.866			$1,320,639	$2,095,231
Molecular Spectroscopic Photoacoustic Imaging for Breast Lesion Characterization	93.286				$58,108
Molecular Target of a Novel Broad-Spectrum Antiviral and Antibacterial Compound	93.855	Oregon State University	P0428A-A		($145)
Molecular targeting of erythroid progenitor cells in normal and disordered human erythropoiesis	93.839	The Feinstein Institute for Medical Research	500798SU		$98,616
Molecular tools for labeling and manipulating functional brain circuits	93.242				$26,865
Molecularly-Targeted Ultrasound in Ovarian Cancer	93.394				$509,270
Molecules and Mechanisms of Mammalian Hair Cell Mechanotransduction	93.173				$830,094
Monitoring of Stem Cell Engraftment in Arthritic Joints with MR Imaging	93.846				$441,893
Mosquitoes meet Microfluidics: Novel tools for Ecological Surveillance of Insect borne Disease	93.855				$311,310
Motivational determinants of postpartum lifestyle behaviors, weight retention, and metabolic syndrome	93.837	Kaiser Foundation Research Institute	210015-Stanford		$9,984
Mouse vestibular regeneration and function	93.173				$471,865
MR-Guided Focused Ultrasound Combined with Immunotherapy to Treat Malignant Brain Tumors	93.394				$745,536
MR-guided Focused Ultrasound Neuromodulation of Deep Brain Structures	93.242				$565,696
MRI Methods for High Resolution Imaging of the Lung	93.838	University of California, San Francisco	10923SC		$53,348
MRI-based Quantitative Susceptibility Mapping of Hepatic Iron Overload	93.847	University of Wisconsin-Madison	813K923		$228,802
MRI-Based Radiation Therapy Treatment Planning	93.394				$328,209
mRNA Template-free Protein Elongation: a New Paradigm for Quality Control at the Ribosome	93.859				$306,273
Mucosal Immune Defense Mechanisms of the Urinary Bladder	93.855	The Washington University	WU-19-392		$41,034
Mulan: a novel regulator of mitochondrial dynamics, mitophagy and heart function	93.837				$491,230
Multi-Arm Optimization of Stroke Thrombolysis (MOST) Stroke Trial	93.853	University of Cincinnati	011266-011		$78,395
Multicenter International Durability and Safety of Sirolimus in LAM Trial (MIDAS) Clinical Study	93.837	The LAM Foundation	MIDAS Site Agreement - 1		$1,576
Multicenter Interventional Lymphangioleimyomatosis Early Disease Trial (MILED)-CCC	93.837	University of Cincinnati	010575-006/PO L19-4500108564 010575-002		($227)
Multi-center Randomized Controlled Trial of Refeeding in Anorexia Nervosa	93.865	University of California, San Francisco	9069sc		$152,862
Multidimensional Analysis of the Immune Status of Latent M. Tuberculosis Infection	93.855				$7,855
Multidimensional cellular interrogation of the kidney in AKI and CKD	93.RD	University of California, San Francisco	10361sc		$49,997
Multi-dimensional network framework for AD detection and progression	93.866				$5,898
Multi-Disciplinary Training Program in Cardiovascular Imaging at Stanford	93.286				$144,243
Multi-Institutional Training in Genetic/Genomic Approaches to Sleep Disorders	93.233	University Of Pennsylvania	574911; #10060997		$57,289
Multi-Institutional Training in Genetic/Genomic Approaches to Sleep Disorders	93.837	University Of Pennsylvania	574911 / RIS 33679/00		$127,669
Multimodal analysis of high-risk psychosis mutations in induced neuronal cells	93.242			$824,648	$2,058,023
Multimodal approach investigating the immunomodulatory effect of neural stem cells in stroke recovery	93.853				$220,149
Multi-modal study of cognitive and neural differences in media multitaskers	93.242			$386,154	$471,706
Multimodality Molecular Imaging of Stem Cell Therapy for Ischemic Cardiomyopathy	93.837				$440,827
Multiomic Signatures of Microbial Metabolites Following Prebiotic Fiber Supplementation	93.213				$438,899
Multiplex Platform for Point-of-Care Newborn Screening of Hyperbilirubinemia	93.865	Baebies, Inc.	HD072853		$103,217
Multiregional imaging phenotypes and molecular correlates of aggressive versus indolent breast cancer	93.394				$424,781
Multi-regional neural circuit dynamics underlying short-term memory	93.853	Baylor College of Medicine	7000000465		$71,635
Multi-scale data integration frameworks to improve cancer outcomes	93.113				$212,758
Multi-Scale Laws of Myocardinal Growth and Remodeling	93.837	University of California, San Francisco	8229sc		$71,985

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Multiscale modeling for vein graft failure risk stratification in CABG patients	93.837			$127,109	$326,470
Multiscale Modeling of Myelodysplastic Syndromes	93.839	Virginia Commonwealth University	FP00000825_SA004		($17,066)
Multisite Phosphorylation and M-Phase Regulation	93.859				$907,844
Multivariate statistical methods, flow cytometry and network modeling.	93.859				$19,136
Myosin Movement in Vitro-Molecular Characterization	93.859				$590,690
Myotonic Dystrophy: Molecular Pathophysiology and CNS Effects	93.853	University of Florida	UFDSP00011946		$67,361
NACC Supplement 2019 and Subcontract	93.866	Washington University	BPO32896		$16,265
Nanomedicine Center for Nucleoprotein Machines	93.862	Georgia Institute of Technology	R7747-G12		($54)
Nanoneedle microrobots for single cancer cell manipulation and genome editing	93.396				$139,841
Nano-optical reporters of dynamic mechanotransduction in the immune system	93.855				$19,625
Nanoparticle-based Triple Modality Imaging and Photothermal Therapy of Brain Tumors	93.394				$400,822
Nanotechnology for Non-perturbative, Longitudinal Sampling from hiPSC Cardiomyocytes	93.286				$185,683
National Center for Simulation in Rehabilitation Research	93.865			$36,718	$922,959
Native American Alzheimer's Disease Resource Center for Minority Aging Research (NAD-RCMAR)	93.866	Washington State University	132471 G003957		$20,644
Natural Killer Cell Diversity and Epigenetics in Vaccine Responses	93.855				$2,420
Natural killer cell repertoire in HIV infection outcomes	93.855				$23,663
Natural killer cells in Zika virus pathogenesis	93.855			$38,323	$236,044
NCANDA: Data Analysis Component	93.273	SRI International	PO15305/ 1044654-100-KATJT PO15305		$344,370
Neighborhoods and Coronary Disease: Exploring Mechanisms and Improving Methods	93.837	Lund University	Grant # 1R01HL116381-01A1		$26,194
Network Control of Diabetes: Aligning Artificial Pancreas Design with Physiology -DP3	93.847	University of Virginia	GC12268 145179		$11
Neural and Kinematic Features of Freezing of Gait for Adaptive Neurostimulation	93.853				$22,568
Neural Basis of alcohol/substance use disorders and suicide in American Indians	93.273	The Scripps Research Institute	5-53951		$9,140
Neural Basis of Behavioral Sequence Loops	93.853	Harvard University	149420.5104941.0103 1028077-678-EAFGS		$426,348
Neural Basis of sensory-Guided Motion	93.853	California Institute of Technology	S399719	$118,838	$472,569
Neural Circuit Dynamics of Drug Action	93.279				$4,101,912
Neural circuit mechanisms underlying hierarchical visual processing in Drosophila	93.242				$53,969
Neural Circuitry and Synaptic Physiology Underlying MDMA's Prosocial Effect	93.242				$204,726
Neural coding of interneuron populations in the retina	93.867				$558,741
Neural Dimensions of Threat Reactivity and Regulation for Understanding Anxiety	93.242				($3,786)
Neural Dynamics and Adaption for Brain-Machine Interface control	93.853				$36,726
Neural Modulation System for in-Home Treatment of Overactive Bladder	93.866	TheraNova	1R43AG058272-01//R43AG058272		$56,936
Neural Networks Underlying Impaired Information Gating in Major Depression	93.242				($3,200)
Neurobehavioral Trajectories of Pediatric Depression and Insulin Sensitivity	93.242				$404,209
Neurobiology and dynamics of Active Sensing	93.242	Columbia University	8(GG012936-02) 8(GG012936-03)		$215,773
Neurochemical and functional neuroimaging of negative and positive valence systems in binge eating	93.242				$186,182
Neurocognitive mechanisms of age-related declines in context-driven adjustments of cognitive control	93.866				$63,007
Neurodegeneration and brain function in Aging with HIV and Parkinson¿s Disease	93.273	SRI International	157-000005		$22,096
Neurodevelopment and Psychosis in the 22q11.2 Deletion Syndrome	93.242	University of California, Los Angeles	2000GVG294		$153,067
Neurodevelopment and Vector-borne Diseases: Building Research Capacity in the Tropics	93.989	Windward Islands Research and Education Foundation	Stanford 2016-01		$79
Neuroimaging and Mentoring in Translational Pain Research	93.279				$130,786
Neuroimaging of Alcohol-Induced Neuroadaptation: Translation from Animals to Humans	93.273	SRI International	PO10259		$199,797
Neuroimaging Predictors of Pivotal Response Treatment in Young Children with Autism	93.173				$146,094
Neuroimaging-Based Brain and Spinal Cord Biomarkers for Cervical Radiculopathy	93.853				$134,883
Neuroligin 3 in oligodendrocyte development	93.853				$1,652
Neuromodulation of Brain States	93.853				$628,260
Neuronal activity-regulated mechanisms of glioma growth	93.853				$390,538
Neuronal and behavioral responses to spinal cord injury	93.853				$719,909
Neuronal Ensembles to Networks: Ultrahigh Resolution Imaging of Human Brain Function and Connectivity	93.286	University Of Minnesota	N006269301		$58,149
Neuronal mapping of anxiety and panic	93.242			$70,726	$243,286
Neuropathologic substrates for motor and cognitive impairment in three existing cohort studies of Alzheimer's disease and related dementias	93.866			$618,995	$1,144,542
Neuroprotection by Modulating ER Stress in Glaucoma	93.867				$162,653
NeuroScout: A cloud-based platform for rapid re-analysis of naturalistic fMRI datasets	93.242	University of Texas at Austin	UTA16-001175		$133,584
Neurostimulation by Ultrasound: Physical, Biophysical and Neural Mechanisms	93.286				$72,884
New Methods of Quantitative Modeling of Protein-DNA Interactions	93.859	Duke University	Subaward # 2034965 A030289		$44,737
New Statistical Methods for Medical Signals and Images	93.286				$337,897
New Therapeutics for Post-Transplant Lymphoproliferative Disorder	93.855				$341,789
NEXT-GEN Oral Test for Monitoring HIV/AIDS in Point-of-Care	93.121	Gaia Medical Institute	GAIA		($10,784)

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Next-generation computational/chemical methods for complex RNA structures	93.859				$775,974
Next-Generation Genomic Imaging Technology	93.310				$528,209
NFAT control of pancreatic islet beta-cell functional maturation	93.847			$52,121	($44,117)
NHGRI Genome Sequencing Program Coordinating Center	93.172	Rutgers University	0356 / PO# 768582 0857 PO 1037371		$101,178
NHGRI PAGE Coordinating Center	93.172	Rutgers University	5943-PO#693120		$87,250
NICHD Maternal-Fetal Medicine Units (MFMU) Network	93.865				$16,175
NIH StrokeNet National Data Management Center (NDMC)	93.853	Medical University of South Carolina	MUSC14-018		$19,099
NINDS Efficacy Clinical Trials: National Clinical Coordinating Center (NCC) Renewal	93.853	University of Cincinnati	011414-Adm-Wintermark		$16,341
NiPype: Dataflows for Reproducible Biomedical Research	93.286	Massachusetts Institute of Technology	5710004077		$125,946
NMDAR Modulation As A Therapeutic Target and Probe of Neural Dysfunction in OCD	93.242			$43,574	$797,576
Non-cardiomyocyte miR-34a Mediates Susceptibility to Right Heart Failure	93.837				$143,494
Non-coding RNA regulation of sex differences in stroke	93.853				$73,322
Non-coding RNA Structure through a Mutate-and-Map Strategy	93.859				$16
Non-esterified fatty acids and dementia; risk, structure and biomarkers	93.866	Brigham and Women's Hospital	119900		$16,218
Nonhuman Primate Testing Center for Evaluation of Somatic Cell Genome Editing Tools	93.351	University of California, Davis	A19-2678-S001		$4,860
Noninvasive bioluminescent imaging of neuronal activity in freely behaving animals	93.279				$87,980
Non-invasive brain stimulation approaches to visual system modeling and plasticity	93.867				$124,985
Noninvasive deep-tissue single-cell imaging and nanoprobe development	93.859				$516,909
Noninvasive monitoring of lung cancer patients treated with radiotherapy	93.395				$308,968
Noninvasive neuromodulation via focused ultrasonic drug uncaging	93.242				$556,224
Non-REM (NREM) on synapse plasticity and beta amyloid (Aß) accumulation in mice: impact on aging and Alzheimer's	93.866				$36,026
North American Mitochondrial Disease Consortium (NAMDC)	93.853	Columbia University	8(GG010312-21)		$21
Notch Signaling and Satellite Cell Activation	93.866				$547,971
Notch signaling in small cell lung carcinoma	93.396				$268,518
Novel Atrial Fibrillation Phenotypes Defined by Functional-Anatomical, Machine-Learned Classifications	93.837				$68,490
Novel Bayesian linear dynamical systems-based methods for discovering human brain circuit dynamics in health and disease	93.286				$688,235
Novel flavored tobacco products: Adolescent perceptions and behaviors	93.279				$59,291
Novel Mechanisms of Regenerative Wound Healing	93.859	Baylor College of Medicine	7000000263		$14,389
Novel Molecular Mechanisms Regulating Postnatal Pulmonary Angiogenesis	93.838				$298,125
Novel Molecules as In Vivo Biological Probes	93.859				$147,033
Novel pathways regulating calcium mediated contractility in the pregnant uterus	93.865			$12,815	$529,651
Novel proximity assay platform for the quantitative detection of HBsAg and HCVcAg	93.061	Ocean Nano Tech, LLC	SPO#136155		$48,773
Novel Regulators of Inflammatory Arthritis and Bone Erosion	93.846	Washington University	WU-15-345/PO #2923117Y		$43,845
Novel strategies to prevent malaria and improve maternal-child health in Africa	93.865	University of California, San Francisco	9943sc		$20,000
Novel therapeutic approaches for enhancing anti-tumor immunity SCLC	93.393	University of Texas MD Anderson Cancer Center	3001010207 3001204957		$145,757
Novel Transducer Technology for Transcranial Ultrasound	93.286				$684,551
Nucleic Acid Enzymes Studied at the Molecular Level	93.859				$494,197
Numbers in the Human Brain	93.242				$485,709
Occupational Exposure to PM2.5 and Cardiovascular Disease(CVD)	93.262			$241,926	$555,099
Ocular Stem Cells for Vision Recovery	93.867				$297,513
Oligoclonal T Cell Expansion and Rheumatoid Arthritis	93.846				$192,761
Omics for TB: Response to Infection and Treatment	93.855	Infectious Diseases Research Collaboration	SU-10170		$25,622
Omics for TB: Response to Infection and Treatment	93.855	Seattle Children's Hospital	12038SUB 11925SUB		$134,804
ONBOARD: OvercomiNg Barriers & Obstacles to Adopting Diabetes Devices	93.847				$43,051
Only time will tell: a computational psychiatry approach to model temporal transitions in brain activity as a lens towards developing better diagnostic nosology for psychiatric illness	93.242				$171,679
OpenNeuro: An open archive for analysis and sharing of BRAIN Initiative data	93.242				$788,263
Optical dissection of the neural circuitry controlling sensorimotor gating	93.242				$50,750
Optical pacing using graphene-cardiomyocyte interfaces for precision medicine and drug discovery	93.837				$453,879
Optimization of an activatable photoacoustic agent to image thyroid cancer	93.286				$232,299
Optimized ultrasound-enhanced immunotherapy	93.394			$83,507	$544,016
Optimizing Lung Cancer Treatment in HIV Infected Persons	93.393	Icahn School of Medicine at Mount Sinai	0255-2961-4609		$29,600
Optimizing safety of mother and neonate in a mixed methods learning laboratory	93.226			$74,346	$648,433
Optimizing Stem Cell-Enhanced Stroke Recovery through a Bioengineered Electrically Conductive Polymer Scaffold	93.853				$167,330
Option 5 Bridge RFP-DT-032417-1	93.RD	SRI International	61-000768		($116)
Optogenetic approaches to study post-stroke recovery mechanisms	93.853				$607,476
Optogenetic Control of Vigilance State Transition	93.242				($950)
Optogenetic Engineered Heart Muscle for Disease Modeling	93.837				$155,209
Optogenetic interrogation of sleep circuits during aging	93.866			$28,007	$537,695
Optogenetics for all: A general method for optical control of protein activity	93.859				($14)

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Oral Polio Vaccine (OPV) and Oral Cholera Vaccine (OCV) Coadministration Study	93.283	International Centre for Diarrhoeal Disease Research,Bangladesh	1228		$73,816
Organoid-Based Discovery of Oncogenic Drivers and Treatment Resistance Mechanisms	93.393				$922,648
Origin of latent hematopoietic stem cells in the aged bone marrow	93.866				$129,460
Origins of human blood lineages in regenerative medicine	93.286				$493,509
Osteoarthritis: Quantitative Evaluation of Whole Joint Disease with MRI	93.286				$442,630
Osteoporotic Fractures in Men (Mr. Os) Palo Alto	93.866				$327,271
Otic Sensory Lineage Specification and Gene Regulation	93.173				$244,409
Oxygen Activation by Mononuclear Copper(I) Active Sites	93.859				$33,821
Oxygenation Fingerprinting with MRI for Ischemic Stroke	93.853				$109
Pacific Udall Center	93.853			$1,184,479	$1,673,517
Packaging and Spreading the Stanford Pediatric Weight Control Program - A Family-Based, Group, Behavioral Weight Control Program for Children with Obesity and their Families	93.349				$118,854
Palliative care needs and outcomes for dementia patients	93.866				$256,246
Pancreatic Cyst Biomarker Validation Study	93.394	University of Pittsburgh	0059566 (130769-4)		$146,169
Pancreatic Ductal Adenocarcinoma Targeted Ultrasound Contrast Agent Development	93.394	NuvOx Pharma LLC	NuxOx SBIR		$178,086
Parasite-specific proteasome inhibitors to combat multi-drug resistant malaria	93.855			$54,016	$227,691
Particulate Delivery of STING Agonist as Anti-cancer Immuotherapeutics and Cancer Microbiome	93.398				$47,716
Paternal medications and congenital malformations in offspring	93.865				$117,339
Pathology Review: NIH National Clinical Trials Network (NCTN) Grant (U10CA180886) successor to NIH COG Chair Grant (U10CA098543)	93.395	Children's Hospital of Philadelphia	FP15221_SUB864_01		$61,454
Pathways towards regenerating the mammalian cochlea	93.173				$432,867
Patient Oriented Research and Mentoring in Obesity and Urinary Incontinence	93.847				$198,414
Patient Oriented Research in Cardiovascular Regeneration	93.837				$103,083
Patient Oriented Research in Vulnerable Populations with Skin Disease	93.846				$52,306
Patient Specific Induced Pluripotent Stem Cell Derived Cardiomyocytes to Define Mechanisms of Electrical-Mechanical Dysfunction in DilatedCardiomyopathy	93.837				$150,933
Patient-Directed Computational Analysis of Atrial Fibrillation	93.837	University of California, San Diego	Subaward #66389647		$29,227
Patterning dendritic branches with environmental and neuronal surface molecules	93.853				$291,610
PCP in vertebrate epithelial tubes	93.859				$432,944
PCSK9 Inhibition after Heart Transplantation	93.837				$168,094
Pediatric Brain Tumor Consortium	93.393	St. Jude Children's Research Hospital	110068201-7821844		$46,080
Pediatric Brain Tumor Consortium	93.395	St. Jude Children's Research Hospital	110068200-7821844 110068185-7707906		$41,455
Pediatric Critical Care and Trauma Scientist Development Program (PCCTSDP)	93.865	University of Utah	10034012-STAN 10034012-STAN; PO#U000142664		$122,224
Pediatric Eye Disease Investigator Group	93.867	Jaeb Center for Health Research	5U10 EY011751-20		$345
Peizo1 in neural stem cell mechanoregulation	93.853	University of California, Irvine	2018-3650		$2,450
Perinatal Arterial Stroke: A Multi-site RCT of Intensive Infant Rehabilitation (I-ACQUIRE)	93.853	Virginia Tech	432107-19751		$21,864
Peripheral and central immune contributions to pain chronification	93.853				$223,354
Peripheral Arterial Disease in Older Patients with Chronic Kidney Disease	93.847				$98,892
Personalized Whole Body Staging for Children with Cancer: A Solution to the Conundrum of Long-Term Side Effects from CT and PET/CT Scans	93.865				$612,831
Personalized, Dynamic Risk-based Lung Cancer Screening	93.398				$47,628
Pesticide exposures and risk of preterm birth	93.865				$162,359
PETAL-Prevention and Earl Treatment of Acute Lung Injury	93.838	University of California, San Francisco	9016sc		$41,239
Pf Bacteriophages in the Pathophysiology of Cystic Fibrosis and Pseudomonas aeruginosa Infection	93.855				$187,260
Pharmacogene Variation Consortium	93.859	Children's Mercy Hospital	17-0012		$343,425
Pharmacology of Aminophylline for Acute Kidney Injury in Neonates and Children	93.865				$151,707
PharmGKB: pharmacogenomic knowledge for precision medicine	93.859				$1,795,327
Phase 2 Study of Selective Cytopheretic Device for the Treatment of Pediatric Patients with Acute Kidney Injury	93.103	Cincinnati Children's Hospital Medical Center	134248		$11,336
Phase 2 Study of Sildenafil for the Treatment of Lymphatic Malformations	93.103				$121,127
Phase 3 Trial of DCA in PDC Deficiency IND 028,625 (02/04/2015)	93.103	University of Florida	UFOCR00012073		$3,685
Phase I Molecular and Clinical Pharmacodynamic Trials ET-CTN	93.395	Beckman Research Institute Of The City Of Hope	51183.2000123.669303		$34,010
Phase II Study of Ad/PNP(IND14271,1/19/10)for HNSCC(OrphanDrugDes,14-4438,6/8/15)	93.103	Emory University	A014084		$146,006
Phase II: Commercialization of a preclinical Magnetic Particle Imaging system with sub-millimeter resolution, nano-molar sensitivity, and integrated CT	93.351	Magnetic Insight, Inc.	SPO 130394		$146,704
Phase II: Development of a Neurovascular Magnetic Particle Imaging system with sub-millimeter resolution and real time speed for non-radiative 3D perfusion angiography	93.351	Magnetic Insight, Inc.	SBIR Phase II		$6,065
Phase one clinical trial of a novel small molecule EBNA1 inhibitor, VK-2019, in patients with Epstein- Barr positive nasopharyngeal cancer, with pharmacokinetic and pharmacodynamic correlative studies	93.395				$143,795
PHASER - Pluridirectional High-energy Agile Scanning Electronic Radiotherapy	93.393	TibaRay, Inc.	1R43CA217607/NIHSBIR-2017-01		$10,175
Phenotype Heterogeneity and Dynamics in SCLC	93.397	Vanderbilt University	UNIV60169		$238,051

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Phenotypic profiling of bacterial stress response networks: A transformative framework for characterizing and predicting antibiotic targets and interactions	93.855				$60,585
Photovoltaic Subretinal Prosthesis with High Pixel Density	93.867				$894,991
Physical Activity to Improve CV Health in Women: A Pragmatic Trial CCC-Lead	93.837				$1,333,727
Physician Organization and the Use, Cost and Outcomes of Care	93.226				$238,758
Physiologically Based Markers of Idiopathic Intracranial Hypertension	93.867				$116,033
Plasmacytoid Dendritic Cell microRNAS in Transplantation	93.855				$60,477
Plasticity of GABAergic inhibition following head injury	93.853				($891)
Platform Technologies for Microscopic Retinal Imaging: Development & Translation	93.867			$321,593	$1,133,034
Platform technology for detection of cancer-associated viruses in HIV patients	93.121			$386,304	$364,876
Polarizing T Cell Responses in vivo With Dendritic Cells	93.847				$506,425
Population genetics for large-scale sequencing studies of diverse populations	93.172			$227,780	$377,750
Population Neural Activity Mediating Sensory Perception Across Modalities	93.853			$227,061	$417,504
Portable Nanostructured Photonic Crystal Device for HIV-1 Viral Load	93.855			$88,579	($4,844)
Postdoctoral Training in the Radiation Sciences	93.398				$175,515
Postgraduate Training Program in Epithelial Biology	93.846				$210,433
Postpartum Hemmorrhage and Anemia: Epidemiologic and Cost-Effectiveness Analyses	93.865				($1,438)
Post-Surgical Predictors of Depression and Weight Regain After Bariatric Surgery	93.847	Sanford Research North	SR-2019-209 51-2031-5035-7		$283,466
Post-Traumatic Headache (PTH) in Children: Alterations of Brain Function, Blood Flow and Inflammatory Processes	93.853	Boston Children's Hospital	PO#GENFD0001502361		$14,531
PQ3: Age-related immune deviation and cancer outcome	93.395				$61,838
Prazosin for Disruptive Agitation in AD (PEACE-AD) Trial	93.866	University of California, San Diego	87750190; PO #S9002309		$1,291
Precancer Atlas for Integrative Characterization of ductal carcinoma in situ (DCIS).	93.353	Duke University	A030739		$23,147
Precancer Atlas for Integrative Characterization of ductal carcinoma in situ (DCIS).	93.393	Duke University	1027999-109-EAFNH: #A030740		$414,927
Precancer Atlas of Familial Adenomatous Polyposis	93.353				$2,261,851
Precision medicine for Asian Americans requiring anesthesia	93.859				$338,473
Precision Medicine for Dilated Cardiomyopathy in European and African Ancestry	93.RD	Ohio State University	60071067; PO# RF01566437		$12,161
Preclinical Testing of a Novel Therapy Targeting AXL in Advanced Kidney Cancer	93.395			$65,289	$446,821
Preclinical Validation of Transglutaminase 2 as a Novel Target for Celiac Disease	93.847			$159,316	$403,969
Predicting Analgesic Response to Acupuncture - A Practical Approach	93.213				$190,365
Predicting casual non-coding variants in a founder population	93.172			$135,855	$105,490
Predicting Clinical Outcome After Traditional and Ibrutinib-Based Therapy in Chronic Lymphocytic Leukemia	93.394	Mayo Clinic	LSU-203034/PO#65953298 LSJ-203034-01/PO#66674629		$32,944
Predicting Clinical Outcomes in Individuals with Small CLL B Cell Clones	93.394	Mayo Clinic	LSU-207246/66194852		$30,023
Predicting Long-Term Chemotherapy-Related Cognitive Impairment	93.RD	University of Texas at Austin	1187887-100-EHBEB		$4,865
Predicting Resilience in the Human Microbiome	93.310	Palo Alto Veterans Institute for Research	REL0028-01		$140,512
Prediction of short-term risk of coronary heart disease and overall risk of ischemic cardiomyopathy	93.837				$51,373
Predictive Adherence Modeling (PAM) Study	93.233				($539)
Predictive signatures in breast cancer using multiplexed ion beam imaging	93.310				$214,671
Predictors and outcomes of frailty in dialysis patients	93.847	Hennepin Healthcare Research Institute	9194sc 00227-02		$19,325
Predoctoral Training Consortium in Affective Science	93.RD	University of California, Berkeley	8572		($6,312)
Predoctoral Training in Biomedical Imaging at Stanford University	93.286				$268,579
Preeclampsia to cardiovascular disease: Life course analysis of biomarkers and risk	93.837				$585,323
Pre-Leukemic Hematopoietic Stem Cells and Clonal Evolution in Human AML	93.396				$205,635
Preparing for a hybrid trial of pulse oximetry de-implementation in stable infants with bronchiolitis	93.838	Children's Hospital of Philadelphia	3201160619		$1,383
Preservation of Vascular and Functional Health Among Nonagenarians	93.837				$66,323
Preserving Beta-Cell Function with Tocilizumab in New-onset Type 1 Diabetes	93.855	Benaroya Research Institute at Virginia Mason	FY19ITN108 FY17ITN108-06 FY17ITN108- 4 FY18ITN108		($6,630)
Prevalence and Clinical Significance of Relative Sarcopenia and Excess Adiposity in Adults with Chronic Kidney Disease	93.847				$68,181
Prevalence and Prognosis of Blood Pressure Medication Deintensification among Older VA nursing Home Residents	93.866	Northern California Institute for Research and Education	PER2133-01		$123,377
Prevalence, Etiology, and Clinical Implications of Low Count Monoclonal B-cell Lymphocytosis (MBL)	93.866	Mayo Clinic	STA-244577/PO #66199733		$20,998
Preventing Avoidable Infectious Complications by Adjusting Payment II	93.226	Harvard Pilgrim Health Care	2R01HS018414-06		$50,325
Preventing Epilepsy Using Vigabatrin in Infants with Tuberous Sclerosis Complex	93.853	University Of Alabama In Birmingham	000510297-002 000510297-002; 5U01NS092595-04		$198,332
Preventing HIV Transmission using a novel sequence-sharing analytic platform: A Multi-jurisdiction Health Systems Approach	93.855	Georgetown University	GR412006-SU AWD-4335044		$21,907
Prevention Center U01: Early Targets For Antigen-Specific Tolerance Induction in Preclinical Rheumatoid Arthritis (Project number: 2-5-24210)	93.855	University of Colorado Denver	2-5-M7126 FY18.090.001 2-5-M8203		$206,639
Prevention of neonatal opioid withdrawal syndrome	93.865			$160,139	$477,756
Prevention Policy Modeling Lab	93.084	Harvard University	116532-5107227		$14,649
PRIDEnet for the All of Us Research Program	93.310				$514,781

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Primary Immune Deficiency Treatment Consortium	93.855	University of California, San Francisco	11267sc		$50,963
Primary Outcomes in Glomerulonephritis Study (PROGRESS)	93.847	University Of Pennsylvania	sub # 574238 PO# 3904166		$21,532
Probing Alzheimer synaptopathy in neurons derived from engineered human iPS cells	93.866				$355,669
Probing the Transcriptome with Multifunctional Acylation Chemistry	93.859				($348)
Probing the Transcriptome with Multifunctional Acylation Chemistry	93.RD				$519,151
Processing of Thalamocortical Inputs by Intracortical Circuits	93.867				$386,682
Production Center for Mapping Regulatory Regions of the Human Genome	93.172			$485,690	$4,489,057
Profiling and Dissecting the Dynamic Regulation of RNA Editing	93.859			$15,901	$497,923
Profiling the protective B cell response to HCV	93.855			$216,000	$737,443
Prognostic Metabolic Signatures of Cancers through Mass Spectrometry Imaging	93.394				$206,234
Program in Translational and Experimental Hematology	93.839				$200,818
Project 4: Integrated Health, Behavioral and Economic Research on Current and Emerging Tobacco Products	93.937	University of California, San Francisco	10984sc		$150,894
Project 5 Title: Multimorbidity, as part of Health and Aging in Africa (HAALSI)	93.866	Harvard School of Public Health	116360-5109417-Project 5		$34,382
Projection-specific modulation of neural activity with a non-genetic method.	93.242				$103,286
Proliferation and Differentiation of Bladder Epithelial Cells in Regeneration and Malignancy	93.396				$623,982
Promoting optic nerve and retinofugal pathway regeneration	93.867				$178,534
Prophylactic Multimodal Cognitive Intervention for Children with Medulloblastoma	93.393	St. Jude Children's Research Hospital	111997040-7827986		$55,426
Protective mechanisms of ischemic postconditioning	93.853				$170,524
Protege: A Knowledge-Engineering Environment for Advancing Biomedical Sciences	93.859				$713,178
Protein Aggregation and Inclusion Body Formation	93.853				$7,913
Protein Folding in the Eukaryotic Cytosol	93.859				$718,316
Protein Kinase C Isozymes in Ischemic Heart	93.837				$524,870
Protein-based Molecular Memories in Gene Regulation, Disease, and Development	93.859				$889,906
Protein-Engineered Hydrogels for Gene Transplantation for Myocardial Infarction	93.837				$157,646
Proteolytically Cleaved Receptors as Oncogenes and Therapeutic Targets	93.398				($3,376)
Proteomic determinants of direct measures of insulin sensitivity	93.847				$839,123
Proteomics Approach to Identify Cardiokine Signaling in Human iPSC Models	93.837				$71,741
Proteostasis in Aging and Neurodegenerative Disease (Core B)	93.866	Northwestern University	60052294 STAN		$60,967
Proteostasis in Aging and Neurodegenerative Disease (Project 1)	93.866	Northwestern University	60052293 STAN		$331,252
Proteostasis in the aging brain	93.866				$635,191
Prototype optical device for image guided surgery with panitumumab-IRDye800	93.394				$972,985
Prototyping an ultrasound system for localized delivery of neuromodulatory agents and functional imaging in awake primates	93.853	Vanderbilt University Medical Center	VUMC69042		$204,999
PSMA activatable MRI contrast agents to improve the detection of prostate cancer	93.286				$3,070
Psychiatric Genomics Consortium for PTSD	93.242	University of California, San Diego	78647299: PO# S9001459		$7,825
Psychobiological Mechanisms Underlying the Association Between Early Life Stress and Depression Across Adolescence	93.242				$538,106
Psychological Risk Factors for Persistent Opioid Use and Prevention of Chronic Opioid Use and Misuse After Surgery: Postoperative Motivational Interviewing and Guided Opioid Weaning	93.279				$389,079
Public Health Surveillance for the Prevention of Complications of Bleeding and Clotting Disorders	93.080	Center for Inherited Blood Disorders (CIBD)	CIBDIX2015CDC-STAN-3 CIBDIX2015CDC-STAN-4		$19,727
Public Insurance Design and Health at Older Ages	93.866				$37,511
Pulmonary Complications in a Birth Cohort after a Randomized Trial of Exposure to Antenatal Corticosteroids: the ALPS Follow-Up Study	93.838	The George Washington University	2-AF-32 PO 1000220114 1009079-100-HAGNJ		$19,293
Pulmonary Hypertension Breakthrough Initiative	93.837	Indiana University	IN4687798STAN; PO#2029358		$108,623
Pulmonary Hypertension In Genetically Modified Mice	93.838				$740,446
Pumps for Kids, Infants, and Neonates (PumpKIN) Clinical Trial	93.RD	New England Research Institute	Task Order 6 Option 1 Task Order 6 Option 2		$96,309
Qualification and Deployment of Imaging Biomarkers of Cancer Treatment Response	93.394			$27,200	$721,663
Quantification of neonatal transport networks through network analysis: a new approach to studying neonatal regionalization	93.226	Beth Israel Deaconess Medical Center	1060852		$4,764
Quantifying the Fluctuations of Intrinsic Brain Activity in Healthy and Patient Populations	93.242				$250,731
Quantifying the sources and dynamics of tumor growth variability using Tuba-seq	93.398				$102,990
Quantitative 3D Diffusion and Relaxometry MRI of the Knee	93.846				$116,363
Quantitative Assessment of Early Metabolic and Biochemical Changes in Osteoarthritis	93.286				$76,916
Quantitative high-throughput nucleic acid assays on a sequencing chip	93.859				$337,968
Quantitative Imaging Biomarkers of Treatment Response and Prognosis in Breast Cancer.	93.398				$175,966
Quantitative Imaging of Cancer Drug Resistance via Radioluminescence Microarrays	93.394				$294,187
Quantitative PET/MRI of Brain Oxygenation in Cerebrovascular Disease	93.853				$101,095
QuBBD: Wearable artificial intelligence for big data-driven healthcare in child development	93.286				$524,969
Queries and Epidemiologic Studies	93.RD	Acumen, LLC.	FDA-2018-10020I-T02		$413,201
RabGEF1 in MyD88 signaling, skin immunity, and atopic dermatitis	93.846				$336,418

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Race/Ethnicity, DNA Methylation, and Disparities in Cardiovascular Mortality: NHANES 1999-2002	93.307	University of Michigan	3004739345		$47,421
Radiation-Induced Tumor Cell Migration	93.395				$352,897
Radiogenomics framework for non-invasive personalized medicine	93.286				$521,244
Radioluminescence dosimetry solution for precision radiation therapy	93.395			$147,566	$353,568
Radiomics & Deep Learning Approaches for Screen Detected Lung Adenocarcinoma	93.396	Vanderbilt University	1028013-100-EAFGV; VUMC 61652		$39,925
Rapid Robust Pediatric MRI	93.286			$81,186	$633,796
Ras/MAPK Mutations Effects on the Developing Brain	93.865				$174,132
RCT of the Effectiveness of Stepped-Care Sleep Therapy In General Practice (RESTING)	93.866				$446,082
RCT on co-management of obesity, depression, and elevated CVD risk in primary care	93.837	University of Illinois at Chicago	1179680-100-EHBAV		($5,022)
RCT on co-management of obesity, depression, and elevated CVD risk in primary care	93.RD	University of Illinois at Chicago	16991		$100,316
Real-time biosensor for mapping the function of the pancreas	93.310				$1,250,339
Recipient Epidemiology and Donor Evaluation Study III (REDS III) - International Site (Task Order 2)	93.RD	The Johns Hopkins University	2003615108		$75,306
Recombinant Immunolabels for Nanoprecise Brain Mapping Across Scales	93.853	University of California, Davis	A19-1044-S003		$18,233
Reconstituting human pancreatic cancer development for translational research	93.396				$408,339
Reconstitution of Transcription Using TATA-less Promoters	93.859				$50,146
Reconstructing Primary Cilia	93.310				$145
Reducing Disparities in End of Life Cancer Care	93.307				$146,294
Reducing Risk: A Comprehensive mHealth Sleep Health Intervention for Adolescents at Risk for Depression and Anxiety Disorders	93.242				$135,458
Regulating Gli Function in Hair Follicle Progenitors	93.846				$232,560
Regulating the Coordination of Microtubule Organization and Cell Cycle State.	93.859				$16,526
Regulation of axon degeneration by the apoptotic pathway	93.853				$366,071
Regulation of Blood-Brain Barrier Function by the RECK/GPR124/Wnt7 Pathway	93.853				$374,056
Regulation of Cell-Type Specific Transcription in Spermatocytes	93.859				($30,542)
Regulation of gastrointestinal hormone signaling and metabolism by Neuromedin U	93.847				$556,078
Regulation of Hedgehog-dependent proliferation by dynamic primary cilia	93.859				$34,804
Regulation of Histone Deacetylases by mAKAP Signalosomes	93.837				$91,539
Regulation of immune cell metabolism in aging and Alzheimer's disease: role of the kynurenine pathway	93.866				$402,955
Regulation of Inflammation and Atherosclerosis by TCF21	93.837				$153,295
Regulation of mitochondrial motility and mitophagy by LRRK2	93.853				$258,926
Regulation of Muscle Stem Cell Fate	93.866				$382,122
Regulation of Signaling by Histidine Protein Methylation	93.859				$101,965
Regulation of Stem Cell Self-Renewal and Differentiation	93.859				$250,398
Regulation of synaptic transmission by retinoic acid signaling	93.242				($380)
Regulation of the DNA damage Response	93.113				$293,455
Regulation of the IgG Fc domain repertoire	93.855				$196,901
Regulators of Epidermal Gene Expression	93.846				$211,551
Regulators of Tumorigenesis	93.396				$268,237
Regulatory Impact on Vape Shop Marketing and Young Adults' Use of ENDS	93.393	Emory University	T921146		$129,382
Regulatory T cells in allogeneic transplantation	93.839				$3,667
RegulomeDB: A Resource for the Human Regulome	93.172			$193,952	$726,636
Repair of mechano-electrical transduction in mammalian auditory hair cells	93.173	University of Kentucky	3048112318-15-204/7800002420		$38,394
Repertoire studies of human antibodies to RSV and MPV F	93.855			$100,927	$361,171
Reporter Gene Technologies for Integrated Cancer Diagnostics	93.394				$339,144
Repurposing systemic therapies to improve clinical outcomes in advanced basal cell cancer	93.398				$165,353
Rescuing Nucleic Acids from Formalin Damage in Cancer Specimens	93.394	Cell Data Sciences, Inc.	55314 122597 122580		$186,364
Research Career Development Institute for Psychiatry (R25)	93.242	University of Pittsburgh	0049415 (128103-1)		$82,895
Research Network on Decision Neuroscience and Aging	93.866			($3,075)	($3,075)
Research Opportunities in Comparative Medicine	93.351				$63,215
Research Training for Child Psychiatry and Neurodevelopment	93.242				$153,907
Resolving Ensemble Averaged Conformations by Multitemperature X-ray Crystallography	93.859	University of California, San Francisco	10531sc		$175,441
Response of cochlear hair cells to pathological changes in the auditory system	93.173				$679,074
Responsive Neurostimulation for Loss of Control Eating	93.853				$180,060
Retail Environment for Tobacco, Marijuana in California: Impact on College Student Use	93.393			$236,076	$588,435
Retinal Ganglion Cell Replacement in Optic Neuropathies	93.867			$383,913	$541,398
Retinal Optophysiology: recording neural activity by optical interferometry	93.867	University of California, Berkeley	00008815/PO# BB01134186		$203,695
Revealing circuit control of neuronal excitation with next-generation voltage indicators	93.242				$1,075,647
Reversal of Progenitor Cell Deficits in Diabetes	93.847				$158,103
Reverse Engineering the Alveolus: From cellular to microenvironment specification during development	93.837				$1,855
Reversible Acylation Reagents for Next-generation Biomolecule and Tissue Preservation	93.113	Cell Data Sciences, Inc.	127377		($10,525)
Reversing Cellular immortality in cancer	93.393				$994,137
Reversing epigenetic changes in aged microglia via young circulatory factors	93.866				$56,589
Revised- Molecular mechanisms of centriolar triplet microtubule formation	93.859				$48,877
Revolutionizing Biomedical and Clinical Research through Innovative Technology	93.172			$8,761	$163,788
RF-penetrable PET ring for acquiring simultaneous time-of-flight PET and MRI data	93.286				$428,864

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Rheumatology Informatics System for Effectiveness Patient-Reported Outcome (RISE-PRO) Dissemination Project	93.226	University of California, San Francisco	11061sc		$104,463
Risk factor analysis of perioperative visual loss	93.RD	University of Illinois at Chicago	16815-02		$116,327
Rituximab for Treatment of SSc-PAH (ASC01) ¿ Mechanistic	93.855	University of California, San Francisco	9336sc		$74,874
Robust 1H MRSI of GABA, Glutamate, Glutamine, and Glutathione	93.242				$321,890
Robust Statistical Methods to Identify and Use Surrogate Markers in Diabetes	93.874	Rand Corporation	9920190021		$45,365
Role and Regulation of colon Trafficking Novel G-Protein Coupled Receptors	93.847			$82,071	$520,016
Role of beta-adrenergic receptors in modulation of cognition and central and peripheral immune systems in Alzheimer's disease	93.866				$343,852
Role of Dendritic Cells in Mixed Chimerism and Tolerance	93.855				$333,271
Role of extracellular matrix malleability in mediating breast cancer cell invasion and migration	93.396			$51,426	$408,938
Role of Glia in the Formation of Functional Synapses	93.279				$73,756
Role of growth and differentiation factors in retinal ganglion cell development	93.867				$28,553
Role of hemeoxygenase-1 in experimental acute pancreatitis	93.847				$523,360
Role of IgG Fc glycan composition in vaccination	93.855	The Rockefeller University	5U19AI111825-05- 2		$35,722
Role of Immune Cells in Chronic Pancreatitis	93.847				$418,114
Role of long non-coding RNAs in sarcoma pathogenesis	93.393	University of California, San Francisco	10160sc		$12,952
Role of L-type Calcium Channels in Human Interneuron Migration and Integration	93.242				$709,063
Role of miR25 in Heart Failure	93.837	Icahn School of Medicine at Mount Sinai	0255-8251-4609		$139,916
Role of Myeloid Derived Suppressor Cells in the Immune Response to Surgery	93.859				$709
Role of nociceptive sensory neuron/mast cell interactions in cutaneous allergic inflammation	93.855				$417,550
Role of novel adherens junction proteins in susceptibility to S. aureus alpha-toxin	93.855				$101,532
Role of Nucleus Accumbens and Its Glutamatergic Inputs in High-Fat intake	93.847				$82,973
Role of PAR-1 Kinase in Synaptogenesis	93.242				$318,160
Role of SETD5 in Chromatin Regulation and Tumorigenesis	93.393	University of Texas MD Anderson Cancer Center	3001326346		$62,364
Role of SMAD3 in Smooth Muscle Phenotypic Modulation and its role in Coronary Artery Disease	93.837				$54,204
Role of Soluble Adenylate Cyclase in Reactive Astrocytes	93.867				$17,993
Role of the Centrosome in Dedifferentiation	93.859				$36,223
Role of the F-Bar-Protein CIP4 in Cardiac Hypertrophy	93.837				$470,239
Role of the METTL13 Lysine Methyltransferase in Signaling and Cancer	93.396				$250,589
Role of the Parathyroid Hormone Receptor in Osteoblast Support of Erythropoiesis	93.847				$87,432
Role of Transglutaminase 2 in Celiac Sprue	93.847			$231,630	$713,083
Role of Wnt-responsive cells in oral mucosa homeostasis, injury, and malignancy	93.121				$33,858
Roles for microRNA-122 and circular RNAs in flavivirus RNA amplification	93.855				$612,686
RPE Energy Metabolism and Cell Phenotype	93.867				$354,452
S18-028 - Human Tumor Atlas Project	93.RD	Broad Institute, Inc.	5500001187		$145,475
Safety Research of Currently Recommended Immunizations: Identifying Genetic, Immunologic and Clinical Factors Predisposing to Adverse Events after MMR Vaccine	93.RD	Kaiser Permanente	209324-01		$157,654
Scalable Coalescent Inference for Large Data Sets	93.859				$372,701
SCH: INT: Collaborative Research: Intelligent Information Sharing: Advancing Teamwork in Complex Care	93.396	Harvard University	123977-5100528		$237
SCH: INT: Collaborative Research: Intelligent Information Sharing: Advancing Teamwork in Complex Care	93.396			$122,606	$358,134
SCIENTIFIC LEADERSHIP NIH National Clinical Trials Network (NCTN) Grant (U10CA180886) successor to NIH COG Chair Grant (U10CA098543)	93.395	Children's Hospital of Philadelphia	FP00015221_SUB781_01-4		$16,987
Selection of New rAAV Vectors Using Replicating Viral Capsids Libraries	93.855				$472,927
Selective Halogenation Reactions for the Synthesis of Chiral Bioactive Small Molecules	93.859				$126,671
Selective Strategies for Mycobacterial Cell Wall Labeling	93.859				$58,192
Self-Management of Type 1 Diabetes During Adolescence	93.RD	Cincinnati Children's Hospital Medical Center	138450; PO# 3100489454		$9,593
Self-Motile Electrodes for Three Dimensional, Non-perturbative Recording and Stimulation	93.867				($615)
Sequelae and immunopathology of Ebola virus infections	93.RD			$13,792	$762,705
Severe Maternal Morbidity: An Investigation of Racial-Ethnic Disparities, Social Disadvantage & Maternal Weight	93.361			$71,875	$452,804
Sex hormone effects on neurodevelopment: Controlled puberty in transgender adolescents	93.242				$452,627
Shear and Light-Sheets to Study Cardiac Trabeculation	93.837	University of California, Los Angeles	1564 G TA493		$135,185
Short Courses in Neuroeconomics and Social Neuroscience	93.866	Duke University	309-0075 309-0091		$19,920
Sigma-1 Receptors: A Novel Clinical Target in Fragile X Syndrome	93.865				$14,263
Signal Transduction by Oxysterols	93.859				$102,759
Signaling mechanisms Controlling Planar Cell Polarity	93.859				$224,950
Signaling Pathways in MDS	93.847			$247,601	$398,199
Simtk.org: A Resource to Enable Collaboration & Reproducibility of Biosimulations	93.859				$64,591
SimTK: An Ecosystem for Data and Model Sharing in the Biomechanics Community	93.859				$362,188
Single Cell Characterization of Latent HIV-1 Reservoirs	93.855	University of California, San Francisco	9815sc		($117,942)

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Single cell epigenomics in cancer immunity and immunotherapy	93.398				$159,819
Single Cell Sequencing of Human iPSC-CM Subtype Identity and Function	93.837				$100,053
Single molecule imaging of Ascl1 during neuronal reprogramming	93.853				$56,090
Single molecule studies of SNARE-induced vesicle fusion	93.242				$565,202
Single Session Pain Catastrophizing Class: Efficacy & Mechanisms for Reducing Opioid Use Among Chronic Pain Patients	93.279				$33,063
Single Session Pain Catastrophizing Treatment: Comparative Efficacy & Mechanisms	93.213				$805,287
Single step strategy for the therapeutic reprogramming in Epidermolysis Bullosa patients	93.846				$86,679
Single synapse analysis of synaptic plasticity by combining electrophysiology and array tomography	93.242				$562,786
Single-cell analysis and synthetic control of mammalian chromatin dynamics and gene regulation	93.859				$332,929
Single-cell analysis of alterations in signaling dynamics that impair cellular proliferation during aging	93.866				$37,235
Single-Cell High-Dimensional Characterization of the Bone Marrow Microenvironment in Health and Disease	93.866			$34,279	$194,427
Single-Molecule Analysis of DNA Secondary Structures during DNA Replication	93.859				$209,837
Single-Molecule Imaging for Cell Biology and Super-Resolution Microscopy	93.859				$678,079
Sleep and Circadian Dysregulation in Pediatric Bipolar Disorder	93.242				$51,820
Small molecule neurotrophin receptor ligands to treat Alzheimer's disease	93.866				$142,334
Small Molecule NOTCH Inhibitors for the treatment of pulmonary hypertension	93.837			$45,833	$94,821
Small non-coding RNA regulation of RAS GTPase function in epidermal homeostasis	93.846				$145,510
Small RNA regulation of gene expression in Entamoeba	93.855				$692,983
Social Disparities in NICU Care	93.865			$243,518	$744,749
Social Insurance Design and International Differences in Health at Older Ages	93.866	National Bureau of Economic Research	41730.Stanford		$63,235
Social Media Intervention to Promote Smoking Treatment Utilization and Cessation Among Alaska Native Smokers	93.279	Mayo Clinic	BOA239893PO6593639 8PO66578893		$22,369
Social Media Technology for Treating Tobacco Addicition	93.393	University of California, Irvine	2016-3319		$122,873
Socioemotional Functioning in Adulthood and Old Age	93.866				$523,170
SOFTWARE FOR LARGE-SCALE INFERENCE OF THE GENETICS OF LIFESTYLE MEASURES, BIOMARKERS, AND COMMON AND RARE DISEASES	93.172				$311,865
Software tool for routine, rapid, patient-specific CT organ dose estimation	93.286	Marquette University	70304-004-03		$25,275
Solid-state patch clamp platform to diagnose autism and screen for effective drug	93.242				$48,756
Somatic Mosaicism in the Brain of Tourette Syndrome	93.242	Yale University	1049579-102-KARRH GR105849(CON-80001722)		$336,389
Spatial Epigenomic Profiling of Immune Cell Signatures at Subcellular Resolution in Health and Disease	93.855				$115,451
Spatial Patterning Modulates Tissue Revascularization and Regeneration	93.837				$116,788
Spatially-resolved proteomic mapping of living cells	93.310				$645,116
Specialized filopodia in long range cell signaling and vertebrate tissue patterning	93.865				$364,763
Specialized ribosomes in control of gene expression and embryonic development	93.310				$287
Spectroscopic Characterization of Oxygen Intermediates in Non-heme and Heme Iron Enzymes	93.859				$314,036
Spectroscopic Photoacoustic Molecular Imaging for Breast Lesion Characterization	93.286				$31,931
Spectrum Stanford Center for Clinical and Translational Research and Education	93.350				$2,326,180
Spleen glia in autonomic regulation of immunity	93.853			$18,173	$39,951
SPORE Pathology Tissue Core	93.397	Sarcoma Alliance for Research through Collaboration	1U54CA 168512-01		$20,173
Sputum Transcriptomic Expression Profiling in Study 31: Express 31	93.855	University of California, San Francisco	10337sc		$103,132
Stanford Advanced Wound Care Center Clinical Research Unit	93.847				$516,983
Stanford Aging & Ethnogeriatrics) Transdisciplinary Collaborative Center	93.866				$104,991
Stanford Alzheimer's Disease Research Center	93.866			$169,531	$1,406,135
Stanford Cancer Imaging Training (SCIT) Program	93.398				$222,052
Stanford Cancer Institute	93.397				$3,602,837
Stanford Career Development Program in Omics of Lung Diseases	93.837				$192,761
Stanford Center for Undiagnosed Diseases	93.310			$63,165	$791,897
Stanford ChEM-H Chemistry/Biology Interface Predoctoral Training Program	93.859				$171,096
Stanford Cooperative Research Center for Novel, Alternative Model Systems for Enteric Diseases	93.855			$175,909	$997,199
Stanford Diabetes Research Center	93.847				$1,638,485
Stanford Effort for NCATS Knowledge Translator	93.350				$357,399
Stanford Health Services Research Training Program	93.225				$204,099
Stanford Human Cancer Models Initiative Center	93.RD	Leidos Biomedical Research Inc.	19X015Q		$110,770
Stanford Molecular and Cellular Characterization Laboratory Supplement Boston	93.396				$847,030
Stanford Molecular Imaging Scholars (SMIS)	93.398				$309,540
Stanford MoTrPAC Bioinformatics Center	93.310				$1,801,249
Stanford Neuroscience Research Cores for Gene Vectors, Microscopy, and Behaviors	93.853				$562,979
Stanford Neurosurgery Resident Research Education Program	93.853				$122,579

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SUMMARY OF PROGRAM CLUSTERS
Year Ended 8/31/2019

Federal Grantor/Federal Program Title	Federal CFDA Number	Pass-Through Entity Name	Pass-Through Entity Identifying Number	Amount Passed through to Sub-Recipients	Total Federal Expenditures
Stanford Precision Health for Ethnic and Racial Equity (SPHERE) Transdisciplinary Collaborative Center	93.307			$219,274	$2,259,803
Stanford Technology Accelerating Medicines Partnership Center	93.846				$227,132
Stanford Tissue Mapping Center	93.310			$16,655	$651,721
Stanford Training Program in Aging Research	93.866				$277,276
Stanford Training Program in Lung Biology	93.837				$337,174
Stanford Undergraduate URM Summer Cardiovascular Research Program	93.837				$53,827
Stanford University NCTN- Network Lead Academic Site	93.395				$290,381
Stanford University Regional Coordinating Stroke Center for the NIH Stroke Trials Network	93.853				$369,603
Stanford Vision Research Core	93.867				$684,232
Stanford Vision Training Program	93.867				$103,218
Stanford/Salk MoTrPAC Site for Genomes, Epigenomes and Transcriptomes	93.310			$182,910	$1,568,154
Stanford-Colombia Collaboratory on Chronic Disease Prevention	93.397			$61,550	$194,464
Staphylococcus serine hydrolases as targets for therapeutic and imaging contrast agents	93.286				$464,380
Statins augment small vessel function and improve stroke outcomes (SALVO)	93.853	Massachusetts General Hospital	228383		$20,366
Statistical Methods for Optimizing Personalized Treatment Selection	93.837			$90,468	$110,700
Statistical methods for personal genome interpretation: genome variation, transcriptome variation, and their combined effects on complex traits	93.172				$140,613
Stem Cell Biology, Cancer Stem Cell Biology, and Cancer Immunotherapy	93.396				$1,078,324
Stem Cell-Based In vivo Models of Human Genetic Liver Diseases	93.847				($4,708)
Stepped--caremanagement of insomnia co-occurring with sleep apnea	93.838	National Jewish Health	20107402_Stanford Sub 20107403_Stanford Sub 20107404_Stanford Sub		$331,075
Storage and recall of human B cell memory of influenza over tissues and time	93.855			$29,627	$495,996
Strategies for tuberculosis control in prisons	93.855			$269,532	$592,615
Strength Training Regimen fOr Normal weiGht Diabetics (STRONG-D)	93.847			$36,660	$634,785
Stroke Hyperglycemia Insulin Network Effort (SHINE)	93.853	University of Michigan	3004208234-SHN		($54)
Stromal Regulation of Basal Cell Carcinoma Formation	93.846				$411,114
Structural and dynamic analysis of GRK interaction with G protein-coupled receptors	93.837	Thomas Jefferson University	080-02000-S29101,PO2000077205		$389,536
Structural and Functional Characterization of the Ebola Virus Replication Complex"	93.855	Washington University in St. Louis	WU-18-66 / PO #2934346E		$201,258
Structural and functional tests of ganglion cell damage in glaucoma	93.867				$85,863
Structural and molecular identification of circuitry underlying joint processing of motivation and aversion	93.279				$717,412
Structural Basis of Opioid Receptor Function	93.279			$141,658	$559,209
Structural Basis of Signal Instigation Through Metabotropic Glutamate Receptors	93.853			$5,193	$957,343
Structural basis of substrate processing in modular polyketide synthases	93.859			$61,272	$263,007
Structural Biology Center for HIV/Host Interaction in Trafficking and Assembly	93.859	University of Utah	10044932-04; PO# U000174110		$293,610
Structural Cell Biology of DNA Repair Machines	93.393	Lawrence Berkeley Laboratories, University of California	7336091		$52,990
Structural correlates of T cell receptor signaling	93.855				$247,796
Structural Dynamics and Mechanochemical Coupling in DNA Gyrase	93.859				($9,441)
Structural interrogation of the HIV - 1 5' leader by multidimensional chemical mapping and integrative modeling	93.855				$179,198
Structural Motifs in RNA	93.172			$189,535	$419,466
Structure and Dynamics of GPCR-G protein complexes	93.859	University of California, San Diego	PO # S9001445, 78010612		$257,612
Structure and Function of Calpain-5	93.867			$80,241	$567,074
Structure and function of EBV protein complexes that trigger epithelial cell entry.	93.855	Northwestern University	60049111 SU		$367,467
Structure and function of HCMV gHgL complexes	93.855				$43,050
Structure and Function of SWEET Sugar Transporters	93.859				$418,225
Structure and Function of the Hepatitis C Virus Genome	93.855				$342,542
Structure and mechanism of the centrosome-cilium complex	93.859				$327,991
Structure of RNA Polymerase II	93.859				$204,696
Structure of the Eukaryote Transcription Apparatus	93.855				$35,273
Structure, function and engineering of immune cytokine receptor signaling	93.855				$608,159
Structure, Mechanism, and Engineering of Assembly Line Polyketide Synthases	93.859				$361,819
Structure/Function Correlations Over Copper Enzymes	93.847				$643,184
Structure-based Bioengineering of Wnt Surrogates for Intestinal Stem Cell Biology and Therapy	93.847				$814,964
Structure-based discovery of allosteric ligands for G Protein Coupled Receptors	93.859			$78,184	$195,596
Structure-based vaccine design for hepatitis C virus	93.855	University Of Maryland At College Park	50917-Z0022201		$198,483
Substance Abuse Treatment to HIV Care (SAT2HIV)	93.279	Research Triangle Institute	8-312-0214650; PO# 65422L		$217
Suppression of basophil activation by IgE glycovariants	93.838			$116,709	$515,618
SURPASS: (Statin Use and Risk Prediction of Atherosclerotic Cardiovascular Disease in minority Subgroups)	93.837				$93,370
SWOG Network Group Operations Center of the NCTN	93.395	Oregon Health & Science University	9009627_STANFORD		$9,627
Synapse Remodeling and Neuronal MHC Class I	93.242				$642,591
Synaptic Specializations in Auditory Hair Cells	93.173			$58,021	$430,111

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Synaptomes of Mouse and Man	93.853	Allen Institute for Brain Science	2017-0404-02 PO AIP050743		$113,069
Synthesis of New Bis-Guanidinium Toxins and Investigation of their Voltage-Gated Sodium Ion Channel Affinity	93.859				$58,052
Synthetic Biology Platforms for Natural Product Discovery and Biosynthesis	93.213				$439,984
Synthetic Studies Related to Cancer Research/Treatment	93.395				$263,622
Systematic approaches to deciphering cis regulation of A-to-I RNA editing	93.859				$351,970
Systematic characterization of trans regulation of A-to-I RNA editing in neurons	93.242				$332,266
Systematic Functional Annotation of Human Cis-Regulatory Genetic Variation	93.310				$62
Systems analysis of innate responses to malaria infection	93.855	Icahn School of Medicine at Mount Sinai	0255-8673-4609		$150,189
Systems Analysis of the Impact of the microbiome on immunity to vaccination in humans (Pilot 1)	93.855	Icahn School of Medicine at Mount Sinai	0255-8673-4609		$148,473
Systems Approach to Immunity and Inflammation Core E - CvTOF Flow Cytometrv	93.855	The Scripps Research Institute	Sub 5-53339 5-53340 5-53880 5-53837 5-53838		$614,886
Systems Biology of Collective Cell Decisions	93.859			$41,075	$92,954
Systems Modeling Guided Bone regeneration	93.846	The University of Texas Health Science Center at Houston	0013113A		$276,799
Systems Modeling Guided Bone regeneration	93.855	Cincinnati Children's Hospital Medical Center	Subaward 138679/ PO3100594845		$15,816
Systems Pharmacological Analysis of Drug Efficacy in Inflammatory Bowel Disease	93.855				$44,562
T Cell Immunity in Giant Cell Arteritis	93.837				$225,886
T Cell Reagent Research for Monitoring T-Cells in Food Allergy	93.855				$325,055
Targeted Advertising for Cancer Prevention	93.310				$293,886
Targeted, wireless neural stimulation with near-infrared light absorbing carbon nanotubes	93.286				($242)
Targeting B Cell MicroRNA in Post-Transplant EBV-Associated B Cell Lymphoma	93.855				$10,104
Targeting cardiovascular events to improve patient outcomes after sepsis	93.837	Boston University	4500002816		$49,564
Targeting Dectin-2 on tumor-associated macrophages for the treatment of cancer	93.395				$607,940
Targeting DNA Demethylation Regulators in Osteoarthritis	93.846				$349,499
Targeting glucose metabolism for the treatment of Hepatocellular Carcinoma	93.350	Michigan State University	RC108590SU		$166,899
Targeting glucose metabolism for the treatment of Hepatocellular Carcinoma	93.350	University of California, San Francisco	10231sc		($1,440)
Targeting Inflammation and Alloimmunity in Heart Transplant Recipients with Tocilizumab	93.855	Massachusetts General Hospital	232560		$6,354
Targeting natural killer cells to HIV in intravenous drug users	93.279				$556,495
Targeting Novel BMPR2 modifiers in Pulmonary Hypertension with Repurposed Drugs	93.838				$449,557
Targeting reactive aldehyde metabolism in endometriosis as a treatment strategy and a diagnostic biomarker	93.865				$92,065
Targeting Senescence pathways in Alzheimer's disease	93.866				$419,705
Targeting STT3A and STT3B to Block Flavivirus Replication	93.855	New England Discovery Partners, LLC.	4531-01Stanford		$38,787
Targeting the cancer glycocalyx	93.859				$256,151
Targeting the kynurenine pathway in Alzheimer's disease	93.866				$396,651
Targeting the Major Histocompatibility Class I-LILRB1 signaling axis for cancer immunotherapy by macrophages	93.398				$43,039
T-cell monitoring and immunotherapy for treating graft-versus-host disease	93.839				$112,774
TCPI Support and Alignment Network	93.639	American College of Physicians	TCPISAN-100-C		$2,808
Technologies to drastically boost photon sensitivity for brain-dedicated PET	93.286				$605,481
Technology development for point-of-care detection and antimicrobial susceptibility testing of Neisseria gonorrhoeae	93.855	The Johns Hopkins University	2004139484		$120,445
Technology Innovations for Supporting Health in Alaska Native People - Diversity Supplement	93.837			$339,493	$528,257
Technology to Improve Eating Disorders Treatment	93.242	Washington University in St. Louis	WU-14-54 /PO 2922705X		$3,471
Technology-Enabled Therapy for Elders with Insomnia and Comorbid Mild Cognitive Impairment	93.866	Environment and Health Group, Inc.	Grant# 1R43AG058334-01A1		$72,955
TELmisartan plus EXercise to improve functioning in PAD: The TELEX Trial	93.837	Northwestern University	60040922 STAN		$23,408
Telomere Damage Responses and Immune Aging	93.855				$411,446
Telomere Length as Mediator Between Early Life Stress and Child Health Outcomes	93.242				$3,475
Templated Chemistry for RNA Analysis	93.859				($355)
Tension-dependent regulation of alpha-catenin during morphogenesis in C. elegans	93.859	University of Wisconsin-Madison	807K240		$95,051
Testing combinations of population interventions to encourage healthy eating	93.847			$90,575	$356,277
Text Mining for High-fidelity Curation and Discovery of Gene-drug-phenotype Relationships	93.879			$86,502	$644,780
TGF-Beta Mediated Inflammatory Signaling: A Critical Role in Epileptogenesis	93.853	University of California, Berkeley	00008681/PO# BB00580365		($1,286)
Th SMAD3 signaling network in coronary artery disease risk	93.837				$508,228
Thalamic Circuits for Prosocial Behaviors in Mice	93.242				$523,185
Thalamic Circuits Underlying Opioid Seeking	93.279				$452,528
Thalamic Contributions to Functional Network Abnormalities in Alzheimer's Disease	93.866				$17,267

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The 200 mammals project: sequencing genomes by a novel cost-effective method, yielding a high resolution annotation of the human genome	93.172	Broad Institute, Inc.	5000530-5500000906		$156,875
The aged systemic milieu inhibits hippocampal neurogenesis and cognition through VCAM1	93.866				($53)
The Atrial Fibrillation - Factor Identification to Risk Modification Study in HD103080	93.847	Baylor College of Medicine	PO # 7000000015		$19,625
The biophysics of skin-neuron sensory tactile organs and their sensitivity to mechanical and chemical stress	93.853				$785,911
The Bio-Tinkering Playground	93.859	The Tech Museum of Innovation	8R25GM129220-02		$61,997
The BMP-PPARgamma Axis and Pulmonary Hypertension	93.838				$422,750
The Cellular Geography of Therapeutic Resistance in Cancer	93.353	Dana-Farber Cancer Institute (505)	1206301		$152,936
The Center for HIV RNA Studies (CRNA)	93.859	University of Michigan	3004815634 P.O. 3005149261	$29,332	$192,327
The Colon Microbiome in Dialysis Patients	93.847				$76,589
The Contribution of T cells to the Pathogenesis of Atherosclerosis in Older Adults	93.866				$113,134
The Cosmos/Vue Smart Eyeglass -HAM System Phase IIB	93.866	Gen-9, Inc.	SPO# 127056		$25,457
The Development of 4-methylumbelliferone Pro-drugs to Prevent Autoimmune Diabetes	93.847				$488,949
The Dynamics of Human Atrial Fibrillation	93.837			$115,778	$221,974
The Dynamics of Molecular Recognition by Proteins: An Integrated Approach using 2D IR Spectroscopy and Molecular Dynamics Simulations	93.859	University of Chicago	FP061436		$110,706
The Effect of Estrogen on Cardiac Arrhythmic Propensity	93.837				$5,414
The effect of vitamin D3 on markers of oxidative stress in boys with X-linked ALD	93.853			$9,594	$254,850
The Epidemiology and Economics of Chronic Back Pain	93.279				$175,984
the Ethics of Inclusion: Conceptualizing Diversity in Genomics Research	93.172				$29,927
The Genetic Architecture of Human Facial Morphology	93.121	University of Pittsburgh	CNVA00055576 (129868-1)		$54,299
The genome architecture of rapid adaptation in Drosophila melanogaster	93.859				$40,675
The Harvard Clinical and Translational Science Center (SMART IRB Ambassador)	93.350	Harvard University	153185.5110601.0104		$35,163
The impact of early medial temporal lobe Tau in human cognitive aging	93.866				$230,523
The Impact of Epstein Barr Virus Infection on the Immune Response in Pediatric Transplant Recipients	93.855			$48,456	$455,891
The Impact of FUS-Mediated Brain Cancer Therapy on BBB Transport, Cytokines, and Immunocyte Trafficking	93.394			$382,021	$745,098
The impact of glomerular disorders on bone quality and strength	93.847	Columbia University	4(GG015009-01); G13413		$9,165
The Impact of Local Coverage Determinations on Costs and Patient Outcomes	93.866	National Bureau of Economic Research	4029E.22.00.01-Stanford		$1,162
The Impact of Mitochondrial Repression and Lipid Accumulation by HIF on Tumor Growth	93.396			$144,966	$785,110
The Impact of Opioids on Chronic Pain: Clinical Research and Career Training in Spinal Cord fMRI and Brain Reward Systems	93.279				($4,276)
The Impact of School Water Access on Child Food and Beverage Intake and Obesity.	93.837			$480,903	$965,853
The influence of health and neighborhood context on economic mobility: Evidence from a social experiment	93.865	University Of Minnesota	H006124303		$47,421
The influence of multi-domain cognitive training on large-scale structural and functional brain networks in MCI	93.866				$220,261
The Insulin-Only Bionic Pancreas Bridging Study	93.847	Jaeb Center for Health Research	DexCom Supplies		$12,249
The Ionic Basis of Spatial Codes in Medial Entorhinal Cortex	93.242				$486,613
The LIFE Study	93.866	University of Florida	UFDSP00010687 Project 00120769		$8,396
The long-term health effects of the New Deal: An 80 year follow-up of 4 cohorts	93.866			$14,960	$238,621
The Lung PCA: A Multi-Dimensional Atlas of Pulmonary Premalignancy	93.353	Boston University	4500003003		$149,933
The Maintenance of Human Atrial Fibrillation	93.837				$182,502
The neural functions of Rai1, the causal gene for Smith-Magenis Syndrome	93.865				$104,012
The NOTCH Signaling Pathway in Large Vessel Vasculitis	93.837			$23,751	$399,617
The paradoxical role of CDKN2B in blood vessel sprouting and maturation	93.837				$41,936
The Phenotypic Landscape of Cognitive Decline as Revealed by Next-Generation Multiplexed Ion Beam Imaging	93.866			$29,023	$761,443
The PIP2-Virus Interface and PI 4-Kinase: Novel Biology and Validation Targets	93.855				$76,420
The prognostic landscape of gender- and ethnicity-specific immune influences on cancer outcomes	93.393				$40,229
The Radiation Planning Assistant (RPA) for Radiation Therapy in Low- and Middle-Income Countries	93.395	University of Texas MD Anderson Cancer Center	3001270893		$54,146
The Referral and Follow-up Patterns of High-Risk Infants	93.865				$50,699
The rhythms of chronic pain: Developing technology for measuring, modeling, and predicting individualized pain patterns in everyday life	93.866	Weill Medical College of Cornell University - New York	183137-P2		$30,823
The Role of Adenosine Kinase in Controlling Beta-Cell Regeneration	93.847				$473,490
The Role of Caregiver Social Processes on Neural and Endocrine Function in Infants	93.242				$153,856
The role of CDKN2B in efferocytosis and atherosclerosis	93.837				$192,108
The Role of Chemotaxis in Helicobacter pylori Distribution in the Host	93.847	University of Oregon	215480A		($418)
The Role of Chromatin in Metabolic Homeostasis	93.859				$354,950
The role of circulating Slit2 in adipose thermogenesis and diabetes	93.847				$317,785
The role of extracellular signaling in mechanisms of drug resistance in basal cell carcinoma	93.398				$31,518
The role of FL2 in Cavernous Nerve Repair in an Animal Model of Radical Prostatectomy	93.RD	Albert Einstein College of Medicine	310235 - P0666048/P0704068 310235 - PO724057		$54,057

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The Role of GABA Co-release from Dopamine Neurons in Ethanol Consumption	93.273				$20,028
The Role of Inflammation in Cardiovascular Disease	93.837	Vanderbilt University Medical Center	1044460-104-NAAQZ VUMC59050 VUMC62891		$348,084
The Role of Leiomodin1 in Vascular Disease	93.837				$111,175
The Role of Membrane Curvature in Surface Nanotopography-Induced Cell Functions	93.859				$288,169
The role of Myt1l in the developing and adult mouse brain	93.242				$274,376
The role of Nkx2-1 in the distal lung	93.838				$10,883
The role of Nrg1 signaling in Schwann cell development and myelination	93.853				$16,927
The role of oxidative stress in the pathogenesis of Reticular Dysgenesis and the therapeutic potential of antioxidants	93.855				$211,472
The Role of Patterned Spontaneous Network Activity in Motor Circuit Activity	93.853				$65,987
The role of primary cilia in glaucoma pathogenesis	93.867				$548,471
The Role of Risk and Benefit Perceptions in Tobacco Control and Product Usage	93.399	University of California, San Francisco	8132sc		($42)
The Role of Sarcomeric Protein Alignment in Connexin 43 Localization at Gap Junction	93.837				$58,492
The role of small RNA derived tRNAs in gene regulation: Mechanism and Therapeutic Applications	93.847			$27,795	$538,888
The Role of Somatic Mutations in Malformations of Cortical Development	93.853	Columbia University	2(GG012194-01)		$28,459
The role of TCF21 in coronary heart disease	93.837				($30,978)
The role of the gut microbiome-host metabolome interactions in heart failure-related insulin resistance	93.837				$55,092
The role of the Wnt5a/ROR2 in the pathogenesis of pulmonary arterial hypertension	93.837				($3,286)
The role of TREM1 signaling in the development of Alzheimer's disease	93.866				$243,977
The Roles of Inflammatory and Glutamatergic Processes in the Neurodevelopmental Mechanisms Underlying Adolescent Depression	93.242				$158,513
The Stanford Extreme Phenotypes in Alzheimer's Disease (StEP AD) Cohort	93.866			$352,502	$671,756
The Stanford SLAC CryoEM Center	93.310				$1,951,326
The Stanford Training Program in ELSI Research	93.172				$311,858
The TOPAS Monte Carlo simulation toolkit for physics, biology and clinical research in radiotherapy	93.395	University of California, San Francisco	10824SC		$305,352
The Tuskegee Syphilis Study and the Health of Black Men	93.307			$25,544	$117,583
The Ubiquitin Proteasome System in ER Quality Control	93.859				$262,888
The use of human iPSC-derived cardiomyocytes to describe the role of ¿-Tropomyosin mutations in hypertrophic cardiomyopathy	93.837				$83,670
The Vascular Effects of Infection in Pediatric Stroke (VIPS II) Study	93.853	University of California, San Francisco	10590SC 11261sc		$58,064
The WHI Strong and Healthy SilenT Atrial fibrillation Recording study (WHISH STAR)	93.837			$210,076	$1,085,670
The WISER Study	93.865			$226,892	$466,263
The Wnt7a/ROR2 axis in the pathogenesis of pulmonary arterial hypertension	93.838				$495,291
Therapeutic Development of RNAi-Based Inhibitors Against the Hepatitis Delta Virus	93.855	SomaGenics Inc	2R44AI104007-02A1		$49,496
Therapeutic dissection of genotype-specific lung cancer vulnerabilities	93.398				$12,704
Therapeutic Exploitation of IPSE, a Urogenital Parasite-Derived Host Modulatory Protein, for Chemotherapy-Induced Hemorrhagic Cystitis	93.847	Biomedical Research Institute	BIG-100		$68,882
Therapeutic miRNA Modulation of Hepatocellular Carcinoma Using Ultrasound Guided Drug Delivery	93.394				$606,910
Therapeutic Strategy for Lymphangioleiomymoatosis (LAM) and Tuberous Sclerosis	93.350	Baylor College of Medicine	PO# 7000000246		($656)
Three-Dimensional Structure of Eukaryote Chromosomes	93.847				$1,534,228
Three-dimensional super-resolution imaging and tracking of disease and treatment mechanisms of progeria	93.859				$6,772
Thumb CMC Biomechanics and Early OA Progression	93.846	Rhode Island Hospital	7017137231		$205,898
Timing of Inguinal Hernia Repair in Premature Infants: A Randomized Trial	93.RD	Vanderbilt University Medical Center	VUMC 53267		$27,240
Tissue Chip Modeling of Synovial Joint Pathologies: Effects of Inflammation and Adipose-Mediated Diabetic Complications	93.350	University of Pittsburgh	0056727 (131589-2) 0056727 (1298942)		$177,508
Tissue Chips for Multipotent Stromal Cell Manufacturing (PI: Ngan Huang/Stanford)	93.103	University of California, San Francisco	Master 9803sc		$697,284
Tissue Cytokine Sequestration and Immune Regulation in Autoimmunity	93.855				$593,512
Tissue engineering approaches for improved treatment of early stage osteonecrosis of the hip	93.846				$579,342
Title Optimizing a Smartphone Application for Individuals with Eating Disorders	93.242	Recovery Record, Inc.	115760		$42,695
TOGETHER: Track Outcomes & Guidance, Enabled Technology for Health & Effective Resources	93.RD	Medable, Inc.	133314,HHSN26120170 0030		$20,095
Tolerance to Combined Kidney and Bone Marrow Transplants from Deceased Donors after TLI and ATG Conditioning	93.855	Benaroya Research Institute at Virginia Mason	1010711-100- HAIGK/FY18ITN197		$23,201
TOPAS - nBIO, a Monte Carlo Tool for Radiation Biology Research	93.395	Massachusetts General Hospital	Subaward 226035		$4,175
Toward improved understanding of sex differences in drug response: developing gene and pathway-based informatics methods to examine sex-differential genetic effects	93.879				$11,695
Toward optimizing diabetes care in persons with chronic kidney disease	93.847				$162,027
Towards a Complete Description of the Circuitry Underlying Sharp Wave-Mediated Memory Replay	93.853			$1,208,137	$3,229,938
Towards automated phenotyping in epilepsy	93.853				$190,291
Towards optimizing care for cardiovascular disease in chronic kidney disease	93.847				$11,900
Toxoplasma rhoptry function	93.855				$345,266
Tracking HIV Infection and Alcohol Abuse CNS Comorbidity with Neuroimaging	93.273	SRI International	PO32128		$236,054
Tracking hospital acquired infections using advanced metagenomics tools	93.RD				$140,344

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Tracking the invaders in multiple sclerosis: Highly specific TREM1-targeted PET imaging of toxic infiltrating myeloid cells and early treatment response.	93.853				$208,073
Training Grant in Academic Gastroenterology	93.847				$215,310
Training in Myocardial Biology at Stanford (TIMBS)	93.837				$358,974
Training in Pediatric Nonmalignant Hematology and Stem Cell Biology	93.847				$204,023
Training Program in Adult and Pediatric Rheumatology	93.846				$362,722
Training Program in Basic Neuroscience	93.242				$644,815
Training Program in Hematopoietic Cell Transplantation	93.839				$50,850
Training Research Leaders in Type 1 Diabetes	93.847				$52,002
Transcription factor control of Entamoeba development	93.855				$3,018
Transcription Factors in Intestinal Differentiation and Cancer	93.398				$77,940
Transcriptional Regulatory Complexes in Epidermal Differentiation	93.846				$90,576
Transcription-Associated Genome Instability	93.859				$340,237
Transformative Computational Infrastructures for Cell-Based Biomarker Diagnostics	93.350	J. Craig Venter Institute	JCVI-16-009 072005 (16-008)		$157,862
Transfusion of Prematurity Early School Age Follow up (TOP 5) CCC	93.839	University of Iowa	S00706-01		$10,106
Transgenerational epigenetic inheritance of longevity	93.310				$80
Transgenic mice and multiplexed, multi-beam instrumentation for large-scale optical experiments on brain states and ensemble cellular dynamics in behaving animal	93.853			$42,095	$633,396
Translating Clinical Decision Making into Systems of Care: A Mid-Career Mentor	93.837				$120,054
Translational Studies of Brain Circuitry Disrupted by Alcoholism	93.273				$19,991
Trans-omics elucidation of genetic architecture underlying cardiovascular and HLBS diseases	93.837				$32,668
Trans-synaptic bidirectional tracing tools for imaging and omics analysis	93.242				$802,430
Trial Net Screening and DPT-1 Follow Up Studies	93.RD	University of South Florida	PO 261241; 253349		$31,942
TrialNet at Stanford University	93.847				$494,596
Trigger waves and coupled oscillations in the embryonic cell cycle	93.859				$307,302
Tumor DNA in CSF and novel modeling decode breast cancer - brain metastases	93.853				$228,085
Tumor Hypoxia: Molecular Studies & Clinical Exploitation	93.395			$262,001	$411,287
Tweet4Wellness: Development and RCT of Mobile Social Support Groups for Sedentary Behavior Reduction	93.837				$152,856
Type 1 Diabetes and the Brain in Children: Metabolic Interventions	93.865	Nemour Children's Hospital	3002224007/PO# 524415-0-RSUB		$622,134
U54 (PI Perera) African American Cardiovascular Pharmacogenetics CONsorTium (ACCOuNT): Discovery and Translation	93.307	Northwestern University	60044818 SU		$131,144
UBXN4 regulation of antibody-drug conjugate delivery to lysosomes	93.859				$41,723
UC San Diego Clinical and Translational Research Institute: Mobile & Fixed Blood Donation Centers as Remote Clinical Trial Sites	93.350	University of California, San Diego	108033896 MP Invoice #S9002073		$72,935
UCSF-Stanford Pediatric Device Consortium	93.103	University of California, San Francisco	11168sc		$215,160
Ultra high throughput sequencer for sustaining and enhancing multi-scale genomic studies	93.351				($36,375)
Ultra high-throughput DNA synthesis via nano-optical conveyer belts	93.172				$283,934
Ultrabright Theranostic SERRS Nanoparticles for Gastrointestinal Endoscopy	93.394	Memorial Sloan-Kettering Cancer Center	BD523749		$263,181
Ultrasensitive Point-of-Care Diagnostics of Zika Infections Prior to Seroconversion	93.855	University of California, Santa Cruz	A19-0123-S001-P0675069		$78,174
Ultrasensitive Quantitation of Circulating Tumor DNA	93.396				$220,594
Ultrasound-Enhanced Drug Penetration for Treatment of Pancreatic Cancer	93.394	University Of Washington	UWSC10443 BPO38965		$162,138
Ultrasound-guided DNA delivery for regenerative medicine	93.286	Cedars-Sinai Medical Center	1458794	$55,094	$498,085
Ultrasound-Guided Robotic Needle Steering for Ablation of Liver Cancer	93.286				$65,924
Unbiased discovery of mechanisms regulating circRNA	93.859				$310,487
Uncovering compensatory mechanisms in family members with disease causing mutations of pulmonary hypertension	93.838				$61,004
Uncovering fundamentals of gene regulation by enhancers	93.859				$68,468
Understanding Control of Adipogenesis by the Dynamics of cAMP	93.847				$23,635
Understanding Force-dependent binding of alpha-catenin to actin	93.859				$261,810
Understanding Long-term Mortality Dynamics and Improving Old-age Mortality Forecasts	93.866				$84,938
Understanding RNA interactions through deep learning modeling of high-throughput biophysical measurements	93.859				$22,222
Understanding Severe Maternal Morbidity: Predictors, Trends, and Disparities	93.865				$50,759
Understanding the reactivity of the most complex multicopper oxidase ceruloplasmin: insight into the reaction intermediates, mechanism and the roles of the additional type 1 copper sites	93.859				$62,592
Understanding the Role of Mucosal Antigen Presenting Cells in Regulating Immune Responses	93.855				$524,903
Understanding the role of physician group organizational capabilities and integration in PCOR Implementation	93.226	Rand Corporation	9920180034	$10,537	$273,416
Understanding volitional state and advancing neuroprostheses through continuous neural recordings in humans	93.853	Massachusetts General Hospital	229356		$148,264
Unified Data Resource for 3DEM	93.859			$242,848	$553,953
Unifying Templates, Ontologies and Tools to Achieve Effective Annotation of Bioassay Protocols	93.879	University of Miami	SPC-000836		$116,344
Unique physiological properties of novel ganglion cell types in primate retina	93.867			$136,563	$611,354
Uniting Mass Spectrometry and Glycoscience to Investigate Cancer Biology	93.398				$70,700
Universal Roles of Force Generation and Transmission in Biological Systems	93.859	Purdue University	4102-83304		$83,725
University of Pittsburgh Clinical and Translational Science Institute - ACT Supplement	93.350	University of Pittsburgh	0055353 (130910-20) AWD00000243(132627-34)		$48,978
UNM Metal Exposure Toxicity Assessment on Tribal Lands in the Southwest (METALS) Superfund Research Program (SRP)	93.143	University of New Mexico	3RDD9 3RDD9-3		$28,131
Unmasking targetable dependencies in cancer with intrinsic or acquired resistance to anti-cancer therapies	93.398				$41,236

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Unraveling mechanisms of tumor suppression in lung cancer	93.393				$27,821
Unraveling the pathogenesis of familial dilated cardiomyopathy towards precision medicine	93.837				$304,697
Use of Repetitive Transcranial Magnetic Stimulation to Augment Hypnotic Analgesia	93.213				$710,318
Using a Closed-Loop System Plus Behavioral Supports in Preschoolers with Diabetes	93.847			$269,167	$506,572
Using artificial intelligence to enable early identification and treatment of peripheral artery disease	93.837				$5,815
Using census data linkages to study long-term impacts on disparities in DNA methylation	93.307				$95,017
Using colloborative cross mice to monitor resilience to malaria	93.855				$11,397
Using community ecology theory to predict the effects of agricultural expansion and intensification on humans and livestock: implications for sustainable agriculture	93.989	University of South Florida	1211-1065-00-A/1R01TW010286-01		$70,360
Using Exosomes to Preserve Viability and Function in Anthracycline Induced Cardiomyopathy Patient Specific Cardiomyocytes After Exposure to Doxorubicin	93.837				$69,354
Using Facebook to Address Smoking and Heavy Drinking in Young Adults	93.279	University of California, San Francisco	9401sc		$10,632
Using Functional Genomics to Inform Gene Environment Interactions for Colorectal Cancer	93.393	The Fred Hutchinson Cancer Research Center	956450		$20,797
Using game theory in primates to study the distributed neuronal and time-causal underpinnings of interactive social behavior	93.242	Massachusetts General Hospital	231064		$175,542
Using Human iDNs to Study Translational Control of Neuronal Function and Survival	93.853				($1,168)
Using NIATx Strategies to Implement Integrated Services in Routine Care	93.279			$168,000	$628,332
Using Protein Interaction Networks and Combinatorial Screens to target KRAS driven cancer	93.396			$146,381	$536,680
Using self-templating proteins to spatiotemporally organize biochemistry	93.859				$67,094
USRDS Special Study Center on Palliative and End-of-Life Care	93.847	University Of Washington	UWSC8324 PO#BPO 6779/BPO37090		$50,631
Utilizing Electronic Health Records to Measure and Improve Prostate Cancer Care	93.393				$756,608
Vaccine Induced Immunity in the Young and Aged	93.855	Emory University	A003088 A161786		$99,642
Vaccine Induced Immunity in the Young and Aged - TDP	93.RD	Emory University	Subaward A010797		$155,685
Vaccine-Induced Immunity in the Young and Aged	93.855	Emory University	A002987		$281,594
Validating Cardiac MRI Biomarkers and Genotype-Phenotype Correlations for DMD	93.837				$119,039
Validation of Biomarkers for Early Diagnosis and Risk Prediction of Pancreatic Neoplasms	93.394	University of Pittsburgh	0053387 (129061-1) 9014911 (131141-1) YR3		$4,250
Valine as a metabolic modulator of hematopoiesis	93.847				$482,334
Variation in Provider Breast Cancer Surveillance Strategies Following Initial Treatment: Contribution of Patient and Provider Factors, Association with Outcomes, and Stakeholder Insights	93.226	University of California, San Francisco	11141sc		$94,669
Varicella-Zoster Virus: T Cell/Skin Tropism & Immunity	93.855				$211,731
Vascularization in bone tissue engineering constructs	93.846				$96,176
Very-long Term Neurocognitive Outcomes in Breast Cancer Survivors; Overlap in the Mechanisms of Alzheimer Disease and Cancer Related Cognitive Impairment	93.393				$78,173
Vestibular and Visual Control of Eye Movement	93.173				$709,580
Viral GPCR recognition of chemokines and engineered ligands	93.855				$498,495
Viral use and mimicry of autophagy pathways and components	93.855				$407,705
Virally-induced tumorigenesis controlled by the microbiota	93.393	University of Chicago	FP068995		$10,419
VIRTUUS Children's Study - Validating Injury to the Renal Transplant Using Urinary Signatures	93.865	Children's Hospital of Philadelphia	3200880522; PO# 962849-RSUB		$109,262
Vitamin D to Prevent Type 2 Diabetes	93.847	Tufts Medical Center Inc	5015644-SERV		$82,433
Vitamin K status, cardiovascular disease, and arterial stiffness in chronic kidney disease	93.847	Tufts University	102508-00001 PO EP0182146		$20,861
Voltage-gated sodium channel regulation of neocortical development	93.853				$81,426
Volunteering as an Avenue for Improving Views of Aging	93.866				$56,850
Wake Forest Alzheimer's Disease Core Center	93.866	Wake Forest University	WFUHS441339 WFUHS101720-441340		$19,119
WASHINGTON UNIVERSITY K12 PROGRAM IN T4 IMPLEMENTATION RESEARCH	93.840	Washington University in St. Louis	WU-19-33		$188,852
Weight-Bearing Imaging of the Knee Using C-Arm CT	93.846			$38,631	$231,665
Western States Node of the National Drug Abuse Treatment Clinical Trials Network	93.279	University of California, San Francisco	10962sc		$170,166
What are we stimulating with transcranial ultrasound in Mice?	93.242				$323,523
WHISH 2 Prevent Heart Failure	93.RD	Care New England Health System	5001381-STEFANICK		$15,804
Whole blood gene expression to identify biomarkers of disease risk, progression and response to therapy in Type 1 diabetes	93.847				$425,822
Whole Genome Sequence Analysis of Ischemic Stroke in the Women's Health Initiative	93.837	The Fred Hutchinson Cancer Research Center	932729 977453		$26,465
Whole Transcriptome Studies of Patients with Transient Ischemic Attacks	93.853	University of California, Davis	201600371-01 (A16-0068-S001)		$34,985
Why do mammals have a flexible three-bone ossicular chain?	93.173			$539,602	$588,122
Wisconsin Alzheimer's Disease Research Center	93.866	University of Wisconsin-Madison	47		$613
Wnt4(+) Cell Fate Mapping and ENaC Activity in Furosemide-treated Mice	93.847	University of Pittsburgh	CNVA00060589 (131753-2)		$6,054
Women's Health Initiative - Regional Centers 2015-2020	93.RD			$151,911	$1,044,526
WormBase: a core data resource for C. elegans and other nematodes	93.172	California Institute of Technology	S405407		$274,558
Y6 Supplement to complete Stanford CAM Center for Chronic Back Pain	93.213				$17,159
Yeast as a Model for Understanding Gene Expression Adaptation	93.859				$542,201
Zimbabwe ICT Project (ZIP) and HIV Research Training	93.989			$15,444	$52,707
Department of Homeland Security					**$163,298**

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Development of New Process for Growing SrI2 Crystals Having a Predetermined Shape	97.RD	CapeSym Inc	CS-19-B-00001		$82,502
Low-Cost Industrial Production of Halide Crystals	97.RD	CapeSym Inc	CS-15-B0040		($68,861)
Single Shot Computer Phase-Contrast Tomography	97.RD				$149,657
Department of Interior					**$618,450**
Assessment of Development and Utilization Technologies of Conventional & Unconventional Reservoirs	15.808				$139,223
Automated fault mapping of the North America-Pacific plate boundary using airborne laser swath mapping (ALSM) data	15.807				$24,588
Collaborative research on earthquakes and lithospheric seismic properities in Saudi Arabia	15.808				$88,375
Continued geologic mapping at Hawks Valley-Lone Mountain volcanic center, southeastern Oregon: Confirming that it contains the oldest caldera associated with Steens/Columbia River flood basalts and the Snake River Plain-Yellowstone trend?	15.810				$3,849
Ecosystem Service Values of Implementing the National Seed Strategy	15.231			$2,061	$12,760
Forest management and socio-economic implications of prescribed burning by Yurok and Karuk Indians	15.232				$14,071
Investigating the seismic signature of earthquake nucleation with dynamic rupture simulations of micro earthquakes	15.807				$76,861
Law of the Sea - Limits of the Extended Continental Shelf	15.808				$7,004
Regionalized Crustal Attenuation for the Continental US Using Higher Order Ambient-Field Correlation	15.807				$69,251
Spatial correlation of ground motion characteristics for regional hazard and risk: regionalization and nonstationarity	15.807				($817)
Stanford-USGS Micro-Isotopic Analytical Center (SUMAC)	15.808				$119,258
The Use of NMR Logging Measurements to Estimate Hydraulic Conductivity in Glacial Aquifers	15.805	University of California Office of the President	SA17-3744-01	$6,581	$64,027
Department Of Justice					**$384,439**
A Confirmatory Test for Sperm in Sexual Assault Samples using a Microfluidic-Integrated Cell Phone Imaging System	16.560			$36,092	$180,169
Advanced statistical population genetics methods for forensic DNA identification.	16.RD				$161,418
Prospective Evaluation of California's Armed and Prohibited Persons System	16.560	University of California, Davis	201403462-04 2014-R2-CX-0012;A15-200-S001A4		$42,852
Department of State					**$1,553,928**
Citizen Trust and Evidence-Based Police Accountability and Professionalization in Mexico	19.703				$1,553,928
Department of Transportation					**$3,742,102**
Air Navigation Based on Global Navigation Satellite Systems	20.RD				$1,867,934
ASCENT Project 25: Continuation of Shock Tube Studies of the Kinetics of Jet Fuels	20.109				$150,322
Mitigate Threats through Space Envioronment Modeling/Prediction Including Micrometeroid and Orbital Debris (MMOD) Detection/Avoidance	20.109				$32,241
Task 331: Advanced 4D Special Use Airspace Research	20.109				$2,957
X-ray Differential Phase Contrast Scanner for Check Bag and Check Point Explosive Detection	20.RD				$1,688,648
Environmental Protection Agency					**$174,317**
ee360 Leadership and Training Collaborative: Building a Stronger and More Inclusive Movement (year 3)	66.950	North American Association for Environmental Education	805039934		$30,794
EPA STAR F1: Drinking Water Security in Times of Drought and Beyond: Improved Prediction, Management, and Decision-Making Tool for Water Distribution in Southern California	66.514				$13,807
Integrating Ecosystem Services Functions and Values into Land-Use Decision Making in the Narragansett Bay Watershed	66.129	Massachusetts Audubon Society	SE-00A00252 Sub 2		$3,601
SEARCH: Solutions for Energy, Air, Climate and Health	66.509	Yale University	GK000293 (CON-80000095)		$116,006
The Persistence of Environmental DNA in the Marine Environment	66.514				$10,109
National Aeronautics and Space Administration (NASA)					**$15,898,918**
"Simulating Energy Buildup and Eruptions in Solar Active Regions"	43.001	University of Michigan	SUBK00008007/PO# 3005157018		$31,327
500°C Capable, Weather¿Resistant Electronics Packaging for Extreme Environment Exploration	43.001	University of Arkansas	SA1704167		$96,968
A Definitive Test for Evolution in the Metallicity of the Intracluster Medium	43.001				$72,415
Advanced Microcalorimeter Arrays for Next Generation Missions	43.001				$76,604
Advanced Physical Models and Numerical Algorithms to Enable High-Fidelity Aerothermodynamic Simulations of Planetary Entry Vehicles on Emerging Distributed Heterogeneous Computing Architectures	43.012				$208,663
Advancing Focal Plane TRL for LiteBIRD and other Next Generation CMB Space Missions	43.001	University of California, Berkeley	9784		$264,766
Algorithmic foundations for real-time and dependable spacecraft motion planning	43.009				$87,995
AN EASIER AND MORE POWERFUL WAY OF ANALYZING FERMI/LAT DATA: FERMIPY	43.001				$5,452
An Innovative High Fidelity Multidisciplinary Computational Framework for Parachute Inflation Dynamics	43.012				$217,167
Angles-Only Navigation System for Nanosatellites	43.012				$30,928
Assistive Free-Flyers with Gecko-Inspired Adhesive Appendages for Automated Logistics in Space	43.012				$117,051
Autonomous Nanosatellite Swarming using Radio-Frequency and Optical Navigation (ANS) - Complement: Starling Formation-Flying Optical Experiment (StarFOX)	43.012				$168,622
Biosynthesis of 3-Methylhopanoids by Purple Non-Sulfur Anoxygenic Phototrophs	43.RD				$59,371
Blind Source Separation for Exoplanet Imaging	43.001	Cornell University	76341-10687		($10,433)
Building a complete sample of z>1 XXL galaxy clusters}	43.001	Smithsonian Astrophysical Observatory	GO8-19107A		$13,053
Building the SPT-HST Legacy: Imaging Massive Clusters to z=1.5	43.RD	Space Telescope Science Institute	HST-GO-15307.002-A		$57,790

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Calibrated Multiangle Radar Measurements of Titan with Emphasis on Scattering and Structure - A Casini RADAR Team Member Proposal	43.RD	Jet Propulsion Laboratory	50989 Contract # 1416721		$12,510
Center for the Utilization of Biological Engineering in Space	43.012	University of California, Berkeley	00009564/PO#: BB00981189		$310,227
CO2 Conversion to Carbon Substrates for Biosynthesis on Space Missions	43.003				($3,171)
Collaborative Manipulation for Space Exploration and Construction	43.012				$49,174
Collaborative Research to Evaluate Add-Air Mixing in Modified Arc-Heaters for Ames Arc-Jets	43.009				$82,242
Cosmic Rays, Magnetic Fields and Diffuse Emissions: Combining Observations from Radio to Gamma Rays	43.001				$79,285
Data Upgrade: HMI Data Corrected for Stray Light	43.001				$26,508
Developing a Material Response Model of Biopolymer-Stabilized Regolith to Predict Micrometeorite Damage of ISRU Habitat Systems	43.012				$51,203
Development of a Fidelity-Adaptive LES Combustion Model for Predicting Fuel-Sensitivities on Combustion Stabilization and Ignition	43.002				$129,023
Development of integrated readout electronics for next generation X-ray CCDs	43.001				$82,182
Development of mechanically versatile bioreactor system as a cellular microgravity countermeasure for regenerative medicine applications	43.009				$12,747
Direct hydrogenation of CO2 to ethylene	43.012				$69,553
DISENTANGLING DARK MATTER GAMMA-RAY SIGNALS FROM ASTROPHYSICAL FOREGROUNDS: COMBINING SEARCHES IN A PUBLIC FRAMEWORK	43.001				$3,156
Does the bacterial production of the eukaryotic biomarker tetrahymanol impact our interpretation of gammacerane biosignatures in the geological record?	43.001				$42,407
Dynamic non-reciprocal structures: numerical optimization, and thermodynamics	43.RD	Lockheed Martin	PO 6574024191		$149,561
Electric-Current Neutralization in Solar Active Regions and its Relation to Magnetic Shear and Eruptive Activity	43.001			$20,387	$57,385
Enabling Precision Cosmology with Optically Selected Galaxy Clusters	43.001	Smithsonian Astrophysical Observatory	GO8-19101A		$124,139
Engineering Gecko-Inspired Adhesives for Robotic Mobility and Manipulation in Microgravity	43.012				$50,188
Enhancing Galaxy Cluster Cosmology	43.001				$992
Evolution of a Multi-Functional Adhesion Module Necessary for Complex Multicellularity	43.001	University of Denver	SC37607-02/P0153800		$115,695
Exoplanets Unveiled: Formation, Evolution and Prospects for Life	43.001	University of California, Berkeley	NNX15AD95G00008748 /BB00562605		$32,179
Experiments in body plans: evolutionary origins of the echinoderm radial body plan	43.001				$162
Feasibility Study of Using Matrix-Stabilized Combustion Technologies to Enable Ultra-low Emission Combustion in Aviation Gas Turbines (Phase II)	43.002			$44,786	$92,260
FOLLOW UP GRAVITATIONAL WAVE CANDIDATES WITH THE FERMI LAT DURING O3	43.001				$4,851
Following the Ultra-Fast Winds in the Stellar-Mass Black Hole, IGR 17091-3624	43.001	Smithsonian Astrophysical Observatory	GO6-17036X		$16,654
Frequency-Dependent Helioseismic Analysis on Solar Meridional Flow, Center-to-Limb Effect, and Sunspots	43.001				$2,309
Frontiers of cluster cosmology	43.001	Smithsonian Astrophysical Observatory	PF5-160138		$23,367
Functional analysis of abundant candidate microbial phyla in geothermal springs	43.001	University of Nevada, Las Vegas	GR07011		$37,253
Gas Diffusion Electrochemical Cells for CO2 to Acetate Conversion	43.003				$159,345
Geant4 expert-level support for NASA/JPL	43.001	Jet Propulsion Laboratory	1582145		($178)
Helioseismic and Magnetoacoustic Waves in and above Sunspots: Origin, Up-Channeling, and Reflection	43.001			$22,581	$111,422
Hemispheric Asymmetries of Magnetic Field	43.001				$7,656
HERO Twin Astronaut Study Consortium (TASC): Immunome Changes in Space	43.003				$8,404
High Resolution Vegetation Water Content, Fire Risk, and Tree Mortality Estimation using Synthetic Aperture Radar	43.001				$45,000
HST Grism observations of the highest-z massive galaxy cluster	43.RD	Space Telescope Science Institute	HST-GO-15267.002-A		$53,558
Human Exploration Research Opportunities (HERO)	43.003	Weill Medical College of Cornell University - New York	PO 4100436121/1606956		$190
Hybrid Modeling of Jet Fuel Combustion Chemistry	43.002				$24,873
IGS 2019: 50 years of Radioglaciology	43.001				$17,406
Impacts of Severity and Legacy of Droughts on Carbon exchange of the Amazon tropical forests	43.001	Jet Propulsion Laboratory	CREI 1571092		$30,229
Improved algorithms for measuring phytoplankton biomass and productivity in the changing Arctic Ocean	43.001				$45,000
Improving estimates of terrestrial gross primary productivity with remote sensing of solar-induced chlorophyll fluorescence	43.001				$24,000
Improving Linkages Between Earth Observations and Ecosystem Service Models with Essential Biodiversity Variables	43.001				$163,788
Improving Magnetic Field Boundary Conditions for Solar Wind Forecast Models	43.001	University of Colorado, Boulder	1557399 PO# 1001116383		$55,968
Inferring the mass function and galaxy content of low mass subhalos with HST observations of ALMA strong lensing systems	43.RD	Space Telescope Science Institute	HST-AR-14567.002-A		$20,184
Integration of InSAR with Airborne Geophysical Data for the Development of Groundwater Models	43.001				$27,211
Intra-Binary Shock Emission in the Black Widow Population	43.001				$103,488
Investigating the Momentum Processes and Magnetic Forces Associated with Solar Flares and Coronal Mass Ejections	43.001	University of California, Berkeley	SUB#00009511/ #NNX17AI28G		$5,239
Investigations of Climate and Environmental Change on Arctic Pacific Shelves (ICECAPS)	43.001				$14,973
IRIS Small Explorer Mission	43.RD	Lockheed Martin	Sub 8100003073 Line #6		$177,752
Joint inversion of seismicity and geodetic observations for imaging volcanic intrusions	43.001				$27,629

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Joint radar and model investigations of Greenland basal water conditions	43.001			$92,199	$296,551
Kepler-K2 AGN Light Curves: A Unique Tool for Accretion Physics and the Detection of Binary AGN	43.001	Smithsonian Astrophysical Observatory	PF7-180168		$95,412
Mars Express Radio Science Experiment, Stanford University Element	43.RD	Jet Propulsion Laboratory	1471562		$213,892
mDOT: Miniature Distributed Occulter Telescope for characterizing extrasolar dust disks	43.001				$99,786
Mechanisms underlying charged particle-induced disruption of CNS function	43.003	University of California, Irvine	2015-3277		$195,131
METEOROID IMPACT DETECTION FOR EXPLORATION OF ASTEROIDS (MIDEA)	43.001				$71,351
Mini Radio Frequency Instrument for Lunar Orbiter	43.RD	Johns Hopkins University Applied Physics Laboratory	138046 CLIN 1 PROJECT LJH06		$49,392
Modeling of Cosmic-Ray Propagation and Galactic Diffuse Gamma-Ray Emission in Support of Current and Future NASA Missions, Phase 3	43.001				$452,589
Modeling the Universe - Interfacing Numerical Simulations, Theory, Statistical Methods, and Observations	43.RD	Jet Propulsion Laboratory	CREI 1574309		$1,574
NASA Food Security and Agriculture Consortium (FSAC)	43.001	University of Maryland	54308-Z6059203		$194,528
NASA SPACE TECHNOLOGY RESEARCH FELLOWSHIPS (NSTRF) - Fall 2018 Textile-Composite Capacitive Sensors for Proprioceptive Origami-based Rovers	43.012				$46,293
National Marine Sanctuaries as Sentinel Sites for a Demonstration Marine Diodiversity Observation Network (MBON)	43.001	University of South Florida	2500-1616-00-C / NNX14AP62A		$152,815
Networking and Navigation for Spacecraft Swarms	43.009				$58,030
Next Generation Microwave Multiplexers	43.001				$2,989
NUSTAR TOO OBSERVATIONS OF LUMINOUS BLAZARS	43.001				$1,661
Oceans Across Space and Time	43.001	Georgia Institute of Technology	RK617-G6		$19,001
Onboard Risk-Aware Real-Time Motion Planning Algorithms for Spacecraft Maneuvering	43.012				$78,058
Optical Counterparts for LAT Pulsars and UNIDentified Sources	43.001				$3,037
Optical Counterparts for Top LAT MSP Candidates	43.001				$374
Optimal Impulsive Control of Spacecraft Relative Motion	43.012				$54,829
OPTIMIZING THE SEARCH FOR ELECTROMAGNETIC COUNTERPARTS TO GRAVITATIONAL-WAVE CANDIDATES WITH THE FERMI-LAT	43.001				$33,429
Passively Compensated Low¿Power Chip¿Scale Clocks for Wireless Communication in Harsh Environments	43.001				$47,117
Perception-Aware Spacecraft Motion Planning	43.012				$77,008
Persistent Scatterer InSAR: Maximizing Coverage and Enabling Application to Groundwater Management	43.001				$102,140
Pinning Down the Origin of an Extreme Radio Phoenix	43.001	Smithsonian Astrophysical Observatory	GO6-17118X		$9,705
Precision GNSS-Based Navigation and Timekeeping for Miniaturized Distributed Space Systems	43.012				$3,910
Predicting Fire Risk in Tropical Peatlands Using SMAP Soil Moisture	43.001				$45,000
Probing the most distant high-mass galaxy clusters from SPT with HST weak lensing observations	43.RD	Space Telescope Science Institute	HST-GO-14677.003-A		$14,330
Providing Enabling & Enhancing Technologies for a Demonstration Model of the Athena X-IFU	43.001				$362,427
Providing enabling and enhancing technologies for a demonstration model of the Athena X-IFU	43.001				($170)
PSR J2124-3358: A Unique, Isolated MSP/PWN/Bowshock	43.001	Smithsonian Astrophysical Observatory	GO6-17059X		$36,503
PSR J2124-3358: A Unique, Isolated MSP/PWN/Bowshock	43.RD	Space Telescope Science Institute	HST-GO-14364.001-A		$263
Quantum-Limited Amplifiers for Detector Arrays on NASA's Inflation Probe	43.009				$18,769
Radiation Hard and High Temperature Tolerant Thermal Imagers	43.001	Jet Propulsion Laboratory	CREI 1631670		$23,335
Radio Science Advisor to Planetary Data System	43.001	University of California, Los Angeles	2090GTB148		$100,245
Real World, Real Science: Using NASA Data to Explore Weather and Climate	43.001	Gulf of Maine Research Institute	30-NASARS-15-Stanford		$143,860
REASON (Radar for Europa Assessment and Sounding: Ocean to Near Surface) REASON	43.RD	University of Texas at Austin	UTA16-001083		$10,077
Reliving The Past: Experimental Evolution of Major Transitions In The History of Life	43.001	Georgia Institute of Technology	RH809-G4		$168,869
Risk-Sensitive Learning and Decision Making for Autonomous Space Robots	43.RD				$65,656
Robust and Efficient GNC Algorithms for Autonomous Formation Flying using Electric Propulsion	43.012				$60,335
Robust Prediction of the Interplanetary Magnetic Field using Statistical and Physics-Based Model Approaches	43.001	Predictive Science Inc.	NASA NNX15AF39G -- NAPR04		$60,204
Robust Verification Tools for Precision Entry Guidance	43.012				$96,700
S3.03-8502 - Advanced High Frequency High Voltage Power Converter	43.RD	QorTek, Inc.	80NSSC18CP2074SUB01/135980		$29,718
Scalable Hierarchical CFD Solvers for Future Exascale Architectures	43.002				$149,482
Science Study for Space-based Optical Atomic Clocks and Optical Time Transfer	43.001	Jet Propulsion Laboratory	Sub No. 1583357		($2,523)
Search for short gamma-ray bursts from core-collapse supernovae induced by axionlike particles	43.001				$14,495
Seeing to the Event Horizons of Supermassive Black Holes	43.001	Smithsonian Astrophysical Observatory	PF6-170160		$100,241
Shapeshifters from Science Fiction to Science Fact: Globetrotting from Titan's Rugged Cliffs to its Deep Seafloors	43.001	Jet Propulsion Laboratory	CREI 1607628		$27,370
Shock structure, the electron-ion equilibration timescale and the disintegrating cool core in A2146	43.001	Smithsonian Astrophysical Observatory	GO8-19110E		$28,787
SIMPLIFIED PARALLELIZED ISCE (SPISCE)	43.001	Jet Propulsion Laboratory	CREI 1586176		$141,744
Slow Slip Events in Cascadia: Observation and Hazard Analysis Derived from InSAR, With GPS and Seismic Data Constraints	43.001				$95,482
Solving the missing satellite problem: detecting dark matter subhalos with gravitational lensing	43.RD	Space Telescope Science Institute	HST-HF2-51358.001-A		$5,309
Space Environmental Electrical Power Subsystem (SEEPS)	43.012				$60,000

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Spaceflight Effects on Bacterial Antibiotic Resistance and its Genetic Basis "Antimicrobialsat"	43.007				$2,462
Structure and Temporal Evolution of Solar Deep Meridional Circulation	43.001				$31,582
Sweet are the Uses of Adversity: Genomic Responses to Stress and its Implication for Adaptation and the Origin of New Species	43.001	Georgia Institute of Technology	RH877-G1		$60,395
Testing Feedback Models of Galaxy Formation Using COS Halos Survey Data	43.RD	Space Telescope Science Institute	HST-AR-13920.002-A		$4,210
The Airborne InSAR and PolSAR Permafrost Dynamics Observatory	43.001	University of Colorado, Boulder	1554878,PO 1000792321		$129,292
The Community Global Evolving Model	43.001				$51,628
The evolution of early-type galaxies: An X-ray perspective	43.001	Smithsonian Astrophysical Observatory	PF5-160134		($14,961)
The Fermi Large Area Space Telescope - Phase E 6-year Extension	43.RD			$375,411	$1,688,428
The Gemini Planet Imager Exoplanet Survey: Completion and Analysis	43.001			$29,984	$186,131
The Highest-energy Electromagnetic Counterparts to Neutron Star Mergers	43.RD	Space Telescope Science Institute	HST-HF2-51407.001-A		$106,230
THE LAT TRANSIENT FACTORY. UNVEILING THE NATURE OF LAT GRBS AND SHORT-DURATION TRANSIENTS	43.001				$19,758
THE LAT TRANSIENT FACTORY: PROVIDING 10 YEARS AND MORE OF LAT GRBS AND SHORT-DURATION TRANSIENTS	43.001				$5,452
The Solar Dynamics Observatory (SDO) Helioseismic and Magnetic Imager Investigation- Second Extended Mission	43.RD			$47,958	$3,825,983
Towards understanding where and when dikes erupt (Student: Elias Heimisson)	43.001				$45,819
Triggering and Evolution of AGN in the Cluster Environment	43.001				$87,681
Tropical controls on the atmospheric growth rate and implications for carbon-climate feedbacks	43.001	Jet Propulsion Laboratory	CREI 1585339		$70,693
Uncovering the True Nature of Warm-Absorbing Winds: The Power of the Fe XXII Doublet	43.001	Smithsonian Astrophysical Observatory	GO5-16105X		$12,302
Understanding Long-lived, Ubiquitous AGN Feedback in Early-type Galaxies	43.001				$40,480
Understanding the Role of Helicity Flux in Solar Eruptions from Active Regions	43.001				$41,477
US Contribution to the Athena Wide Field Imager	43.001	The Pennsylvania State University	5584-LSJU-NASA-B07G	$226,982	$380,950
Using earth observations and ecosystem modeling to improve the sustainability of agribusiness and extractive industries in working landscapes	43.001				$220,055
Using Model-Data Fusion to Determine Plant Hydraulic Traits and Transpiration	43.001				$78,971
Validation of wall models for LES with application to the NASA Common Research Model	43.002				$238,181
WFIRST Extragalactic Potential Observations (EXPO) Science Investigation Team	43.RD	University of California, Santa Cruz	A16-0381-S003-P0590505		$6,584
Witnessing the Formation of a Radio Halo	43.001	Smithsonian Astrophysical Observatory	GO8-19115A		$61,869
Zooming Out: How Regular are Cluster Atmospheres at and Beyond the Virial Radius	43.001	California Institute of Technology	S401907		$25,239
National Endowment for the Arts and Humanities					**$252,086**
Email: Process, Appraise, Discover, Deliver - ePADD Phase 2 Proposal #LG-70-15-0242	45.312				$125,517
Martin Luther King, Jr., Papers Project	45.161				$8,120
The Global Medieval Sourcebook	45.169				$22,091
The Marzamemi Church Wreck	45.161				$96,358
National Science Foundation (NSF)					**$80,661,071**
"Big-Data" Asymptotics: Theory and Large-Scale Experiments	47.049				($1,290)
A Belonging Intervention to Improve STEM Outcomes for Underrepresented Students: A Randomized-Controlled Trial at 22 Colleges	47.076	Indiana University	BL-4831221-SU / PO 2113492 GF		$60,999
A New Mechanism for Mode Water Formation at a Thermohaline Ocean Front	47.050				$5,021
Advanced photoelectrode architectures of tantalum (oxy)nitrides for photo-electrochemical (PEC) water splitting	47.049	California Institute of Technology	68D-1094586		$8,490
AF: Medium: Collaborative Research: Beyond Sparsity: Refined measures of complexity for linear algebra	47.070				$129,583
AF: Medium: Collaborative Research: Circuit Lower Bounds via Projections	47.070				$55,663
AF: Medium: Collaborative Research: Exploiting Opportunities in Pseudorandomness	47.070				$146,635
AF: MEDIUM: Collaborative Research: Foundations of Adaptive Data Analysis	47.070				$43,928
AF: Small: New Directions in Algorithmic Game Theory	47.070	Columbia University	1(GG014588) / SAPO: G13765		$4,458
AF: Small: New Directions in Algorithmic Game Theory	47.070				$86,791
AF: Small: New Perspectives on Mathematical Programming Relaxations	47.070				$904
AF: Small: Robust and Secure Learning	47.070				$92,236
AF:Medium:Collaborative Research:The Quest for Statistically Optimal Algorithms	47.070				$41,533
AF:Medium:Collaborative: Algorithmic Foundations for Trajectory Collection	47.070				$45,259
AF:SMALL:Geometry of Polynomials and Algorithm Design	47.070				$117,975
AitF: Collaborative Research: Efficient High-Dimensional Integration using Error-Correcting Codes	47.070				$77,799
AiTF:Collaborative Research: Fair and Efficient Societal Decision Making via Collaborative Convex Optimization	47.070				$265,696
An Approach to Robust Performance Analysis using Optimal Transport	47.049				$49,779
An experimental facility to test the impacts of multiple physical stressors on physiology, ecology and genomics of marine species	47.074				$41,898
An Interdisciplinary Approach to Reducing Disparities in Social Capital	47.075				$76
ANES WEB: American National Election Studies 2018-2021	47.075				$44,700
Approaches to Improve Synthesis Design: Mechanistic and Synthetic Studies on New Annelation Methods	47.049				$218,916

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Asylum Seeker and Refugee Integration in Europe	47.075			$26,377	$130,206
Auction Market Design	47.075				$34,013
Automatically Detecting Security Events and Trends in Network Telescope Data	47.070	University of Michigan	SUBK00010794 / 3005341607		$41,201
Bargaining Through the Lens of Big Data	47.075	National Bureau of Economic Research	36293.00.00.00-7700		$16,920
Baseline Survey of Asylum Seekers in Germany	47.075				$109,977
BIGDATA: Collaborative Research: F: From Data Geometries to Information Networks	47.070				$117,886
BIGDATA: F: BCC: Data driven optimization of classroom learning activities	47.076	University Of Washington	UWSC10355 / BPO 29468		$233,243
BIGDATA: F: Computationally efficient algorithms for large scale crossed random effects models	47.070				$101,229
BIGDATA: F: DKA: Collaborative Research: Dealing Efficiently with Big Social Network Data	47.070				($3,388)
BIGDATA: F: Reliable Inference with Big Data: Reproducibility, Data Sharing, Heterogeneity	47.070				$305,785
BIGDATA:IA: Hype Cycles of Scientific Innovation	47.070				$449,694
Bio-Inspired Ankle-Knee Coupling to Enhance Walking for Individuals with Transibial Amputation	47.041	Vanderbilt University	UNIV59842		$3,107
Biology with X-ray Lasers	47.074	State University of New York at Buffalo	R1092330		$199,243
BIOROBOOST travel support for US-based researchers to workshops to develop standards in synthetic biology	47.074				$3,564
Brain Comp Infra: EAGER: A knowledge infrastructure for cognitive neuroscience	47.070				$88,003
Building a Framework for Developing and Evaluating Contextualized items in Science Assessment (DECISA)	47.076			$99,310	$321,334
California Alliance for Graduate Education and the Professoriate-II	47.076	University of California, Berkeley	9415		$120,964
Career Life Balance in Effects of temperature on vector-borne disease transmission: Integrating theory with empirical data	47.074			$446,593	$573,536
CAREER: A Hydrologic Thermostat for the Global Carbon Cycle?	47.050				$34,592
CAREER: A Runtime for Fast Data Analysis on Modern Hardware	47.070				$54,667
CAREER: Algorithms for understanding data	47.070				($8)
CAREER: Building empathy through social psychological interventions	47.075				$91,663
CAREER: Chemical Synthesis and Biophysical Study of Noncanonical Membrane Lipids	47.049				$2,881
CAREER: Controlling Ecologically Destructive Processes with a Network of Intelligent Robotic Agents	47.070				$107,922
CAREER: Controlling Polymer Degradation, Microstructures, and Sequences via Living Alternating Polymerization of Cyclopropenes and Low-Strain Cyclic Olefins	47.049				$206,129
CAREER: Crossing over into the geochemical milieu: Using the molecular genomic record to inform the geologic biomarker record	47.050				$77,546
CAREER: Cross-Instrument Synthesis of Antarctic Radar Sounding Observations	47.050				$91,030
CAREER: Data Analytics for Distribution Systems Management and Operations	47.041				$62,185
CAREER: Dielectric screening in structured polymer electrolytes	47.049				$53,868
CAREER: Efficient Learning of personalized Strategies	47.070				$26,980
CAREER: Enabling expert crowdsourcing via coordination, targeted contribution and education	47.070				$60,407
CAREER: Enabling the Design of Future Robotic Transportation Systems via Spatial Queueing Network Theory	47.041				$58,418
CAREER: Extremal Combinatorics: Methods, Problems and Challenges	47.049				$22,883
CAREER: Form and Function of Bacterial Amyloid Fibers	47.074				$255,263
CAREER: From Ecology to Neurobiology: spatial cognition in rainforest frogs	47.074				$59,901
CAREER: Healthcare Decision Models with High Dimensional Data	47.041				$78,034
CAREER: How Birds Lift Weight with Flapping Wings	47.074				$149,504
CAREER: Interrogating and Exploiting the Hydrodynamics of Concentrated Emulsions for Droplet Microfluidics.	47.041				$177,500
CAREER: Investigating the structure and dynamics of proton defects in heterogeneous environments with accelerated quantum simulations	47.049				$196,151
CAREER: Investigation of a prion-based metabolic switch driven by cross-kingdom chemical communication	47.074				$83,206
CAREER: Midfield Wireless Powering of Subwavelength Probes for Neuroscience and Cardiology Applications	47.041				($4,802)
CAREER: Modeling and Inference for Large Scale Spatio-Temporal Data	47.070				$9,839
CAREER: New Fundamentals in Coding Theory	47.070				$43,311
CAREER: Novel designs for kidney exchange and other markets, in the intersection of Operations Research, Economics and Computer Science	47.041				$13,242
CAREER: Optimizing Computational Range and Velocity Imaging	47.070				$59,188
CAREER: Print and Fold Optical Instruments	47.041				$131,130
CAREER: Probabilistic Design and Engineering of Sustainable Infrastructure Using Multi-Physics Modeling Approaches	47.041				$139,950
CAREER: Regulation of stem cell migration by extracellular matrix plasticity	47.041				$22,741
CAREER: Revealing a Reduced-Order Model for Chaotic Electroconvection and its Applications	47.041				$158,769
CAREER: Rheology, Stability, and Sudden Collapse of Colloidal Gels: A Micromechanical Study	47.041				$804
CAREER: Small-molecule capture and ion transport in well-defined hybrid materials	47.049				$11,899
CAREER: Stretchability by Design - Understanding Mechanical Phenomena in Microarchitectured Soft Material Systems	47.041				$79,048
CAREER: Subduction Zone Hazards: Megathrust Rupture Dynamics and Tsunamis	47.050				($415)
CAREER: The optimal use of data	47.070				$111,569
CAREER: Theory of Fast Graph Optimization	47.070				$57,782
CAREER: Two-Dimensional Phase Change Materials	47.049				$127,210

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Federal Grantor/Federal Program Title	Federal CFDA Number	Pass-Through Entity Name	Pass-Through Entity Identifying Number	Amount Passed through to Sub-Recipients	Total Federal Expenditures
CAREER: Ultrasonically-Powered Smart Medical Implants for Monitoring and Modulating Local Physiology	47.041				$30,243
CAREER: Understanding Redox Activity of Electroceramics using Atomically-Flat Surfaces	47.049				$43,899
CAREER: Unifying representation stability via FI-categories	47.049				$24,526
CAREER: Visualizing Earth's Core-Mantle Interactions using Nanoscale X-ray Tomography	47.050				$7,058
CAREER: When do mycorrhizal fungi influence plant community dynamics?	47.074				$1,928
CAREER:Interactive Training of Semantic Parsers via Paraphrasing	47.070				$116,421
CCF-BSF: AF: CIF: Small: Low Complexity Error Correction	47.070				$122,760
CCI Center in Selective C-H Functionalization	47.049	Emory University	T849613 A022569		$291,922
CCI Phase I: Center for First Principles Design of Quantum Processes	47.049			$119,781	$393,089
CCSS:Emulating Mixed-Signal VLSI Systems	47.041				$48,679
CEDAR: Investigation of Atmospheric Neutral Density Dynamics Through Meteor Observations	47.050				$33,504
Center for Cellular Construction	47.074	University of California, San Francisco	9907sc 9917sc		$167,259
Center for Dark Energy Biosphere Investigations (C-DEBI)	47.083	University of Southern California	66468074/PO# 10392717		$363,112
Center for Energy Efficient Electronics Science (E3S)	47.041	University of California, Berkeley	007445/BB00099670/EE CS-0939514		$84,119
Center for Environmental Implications of Nanotechnology	47.074	Duke University	14-NSF-1048		$5,379
Center for Turbulence Research Summer Program	47.041				$1,903
Chiral Quantum Networks	47.049	University of California, Santa Barbara	KK1924		$37,767
CHS: Medium: Collaborative Research: Augmented Reality Agents with Pervasive Awareness, Appearance, and Abilities	47.070				$70,615
CHS: SMALL: Blending the Virtual & the Physical: Understanding and Designing Crowd-Based Open Innovation Systems for Physical Products	47.070				$132,880
CHS: Small: Collaborative Research: The Presentation of Self in Networked Life	47.070				$107,765
CHS: Small: Collaborative Research: Wearable Fingertip Haptic Devices for Virtual and Augmented Reality: Design, Control, and Predictive Tracking	47.070				$216,524
CHS: Small: Collaborative: Teleoperation with passive, transparent force feedback for MR-guided interventions	47.070				$79,551
CHS:Small:Collaborative Research: Understanding and Improving Implicit Coordination in Peer Production Networks	47.070				$45,139
CIF: Medium: Collaborative Research: On Demand Physical Layer Cooperation	47.070				$20,879
CIF: Small: Collaborative Research: Generative Adversarial Networks: From Art to Science	47.070				$2,867
CIF: Small: Collaborative Research: Generative Adversarial Privacy: A Data-driven Approach to Guaranteeing Privacy and Utility	47.070				$8,979
CIF: Small: Energy-neutral Massively Large Wireless Networks	47.070				$143,095
CIF:Medium: Collaborative Research: Learning in High Dimensions: From Theory to Data and Back	47.070				$101,139
CIF:Medium:Collaborative Research: Geometric Network Information Theory	47.070				$109,418
CIF:Small:Information-theoretic and Computational Thresholds in Statistical Learning	47.070				$111,226
CIF21 DIBBs: Building a Scalable Infrastructure for Data-Driven Discovery and Innovation in Education	47.070	Carnegie Mellon University	1122183-333107;ACI-1443068		$68,767
CM: Collaborative Research: Simulation-based software tools for automated knitting	47.041				$62,893
CNH-L The coupled climate and institutional dynamics of shortlived local pollutants and long-lived global greenhouse gases	47.050	University of California, San Diego	92908921 (PO# S9001719)		$232,735
CNS Core: Large: Autonomy and Privacy with Open Federated Virtual Assistants	47.070				$287,800
Coastal SEES: Coastal fog-mediated interactions between climate change, upwelling, and coast redwood resilience: Projecting vulnerabilities and the human response	47.050	University of California, Santa Cruz	A17-0931-S003-P0685727		$204,598
Co-Director of the Southern California Earthquake Center (SCEC)	47.RD	University of Southern California	1008681-1-HAJZF		($52,130)
Co-funding for: Quantifying the Contribution of Disinfection Byproducts to the Toxicity of Wastewaters Purified for Potable Reuse: Which Byproduct Classes Matter?	47.041	Water Research Foundation (WaterRF)	Project 04737		$40,552
Cohomological periods and high rank latices	47.049				$23,227
Colaborative Research: Identifying and harnessing local refuges from oceanographic extremes for coastal marine species and fisheries	47.050				$333,461
Collaborative proposal: Developing a battery of methods for the study of the trafficking mechanisms and transformations of silver and gold nanomaterials in human cells	47.041				$4,453
Collaborative Research: "Seeing" Neighborhood Mechanisms of Health Inequality with Computer Vision	47.075				$41,206
Collaborative Research: A New Computer Science Faculty Teaching Workshop	47.076				$12,076
Collaborative Research: A Partnership to Adapt, Implement and Study a Practice-based Professional Learning Model and Build District Capacity to Meet the Challenges of NGSS	47.RD				$288,957
Collaborative Research: ABI Innovation: Computational Methods for Soft Selective Sweeps	47.074				$213,712
Collaborative Research: American National Election Studies (ANES) 2014-2017	47.075				$471,262
Collaborative Research: Analysis and Modeling of Nonlinear Wave-Particle Interactions from the Siple Transmitter Experiment	47.050				$20,402
Collaborative Research: Applying Automated Analysis to a Learning Progression for Argumentation	47.076				$116,336
Collaborative Research: Automatic video interpretation and description	47.049				$70,675

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Collaborative Research: Axion Resonant InterAction DetectioN Experiment (ARIADNE) - a continuation proposal	47.049				$104,964
Collaborative Research: Biogeochemical significance of the abundant, uncultivated symbiotic cyanobacteria UCYN-A	47.050				$4,120
Collaborative Research: Cobalamin and Iron Co-Limitation Of Phytoplankton Species (CICLOPS) in Terra Nova Bay	47.050				$66,543
Collaborative Research: CompCog: Broad-coverage probabilistic models of communication in context	47.075				$29,464
Collaborative Research: Compressive Robotic Sensing Systems: Gaining Efficiency through Sparsity in Dynamic Sensing Environments	47.041				$138,670
Collaborative Research: Density-enhanced data assimilation for hyperbolic balance laws	47.049				$152,222
Collaborative Research: Designing thermophotonic materials for passive radiative cooling	47.041				$16,400
Collaborative Research: Differential contributions of archaeal ammonia oxidizer ecotypes in relation to their changing environment	47.050				$8,863
Collaborative Research: EAGER: The early evolution of the Brachiopoda- an integrated phylogenomic and paleontological approach	47.074				$51,090
Collaborative Research: Effect of Helicity on the Development of Free-Shear Turbulence at High Reynolds Number	47.041				$94,234
Collaborative Research: Elucidating environmental controls of productivity hot-spots around Antarctica	47.050				$193,450
Collaborative Research: Engineering Fully Biobased Foams for the Building Industry	47.041				$113,048
Collaborative Research: Fluid Mechanical Basis of Universal Natural Propulsor Bending Patterns	47.041				$132
Collaborative Research: Foraging behavior and ecological role of the least studied Antarctic krill predator, the Antarctic minke whale (Balaenoptera bonaerensis)	47.050				$94,636
Collaborative Research: Framework: Software: CINES: A Scalable Cyberinfrastructure for Sustained Innovation in Network Engineering and Science	47.070				$91,531
Collaborative Research: Helium-isotope systematics along seismic profiles in Tibet to study geometry of Indian and Tibetan lithosphere beneath the Lhasa and Qiangtang terranes	47.050				$83,450
COLLABORATIVE RESEARCH: HIGH-PERFORMANCE COMPUTATIONAL STANDARDS FOR REDISTRICTING	47.075				$23,241
Collaborative Research: Hydrologic Disturbance in Tropical Peatlands: Linking Drainage, Soil Moisture, Flammability, and Carbon Fluxes	47.RD				$12,543
Collaborative Research: IDBR: Type A: Diver-Operated Imaging Platform with Complementary Systems for Quantifying Aquatic Organism Interactions	47.074				$70,967
Collaborative Research: Imaging the Beginning of Time from the South Pole: The next Stage of the BICEP Program	47.050				$107,932
Collaborative Research: Improved observation and parameterization of bottom boundary layer turbulence and particle properties for sediment fate and transport modeling	47.050			$240,513	$445,569
Collaborative Research: LSC Center for Coatings Research	47.049				$65,017
Collaborative Research: Management and implementation of the US GEOTRACES Pacific Meridional Transect	47.050			$68,082	$145,609
Collaborative Research: Mapping High-Performance Design Team "Genome"	47.041				($1,024)
Collaborative Research: Measurement of Particle Aggregation in Laboratory-scale Flows for Improved Models of Volcanic Ash Fallout and Entrainment	47.050				$88,323
Collaborative Research: Mechanisms and Controls of Nitrous Oxide Production in the Eastern Tropical North Pacific Ocean	47.050				$134,026
Collaborative Research: MESOBOT: A ROBOT FOR INVESTIGATING THE OCEAN INTERIOR	47.050				$139,707
Collaborative Research: Mining Seismic Wavefields	47.050				$60,308
Collaborative Research: Modeling the Invention, Dissemination, and Translation of Scientific Concepts	47.075				$88,624
Collaborative Research: Multiplexing: Theories and Tests of Interactions Between Types of Relationships	47.075				$31,052
COLLABORATIVE RESEARCH: NANOPATTERNING AND TEMPORAL CONTROL OF PHASE-CHANGE MATERIALS FOR HIGH-BANDWIDTH DEVICES	47.041				$448
Collaborative Research: New Algorithms for Computing Equilibria of Stochastic Games	47.075	Princeton University	SUB0000134		($70,212)
Collaborative Research: NGSS Science and Engineering Practices and English Language Learners	47.076				$536,327
Collaborative Research: Nonlinear Coupling and Relaxation Mechanisms in Micro-Mechanics	47.041				$48,413
Collaborative Research: NRI-Small: Rapid Exploration of Ankle-Based Locomotion Assistance Strategies Using a Novel Co-Robot Testbed	47.041				$48,770
Collaborative Research: NSF INCLUDES Alliance: STEM Core Expansion	47.076	Saddleback College	SC-SUB-G1300		$150,743
Collaborative Research: Predicting the global location of heat tolerant corals: Palau patch reefs as a general model	47.050			$28,936	$147,059
Collaborative Research: Probing the frictional behavior of the Tohoku megathrust using GPS, seismicity, and physics-based models	47.050				$81,917
Collaborative Research: Professional Engineering Pathways: A Longitudinal Study of Early Career Preparedness and Decision-Making.	47.041			$17,389	$17,389
Collaborative Research: RUI: Quantifying performance in animals exposed to predictable and unpredictable variation in multiple environmental factors	47.074				$24,780
Collaborative Research: Scalable Kilo-Pixel Detector Modules Based on Polarization Sensitive Multi-Chroic Aluminum Manganese MKIDs	47.049				$57,628
Collaborative Research: Scaling of Unsteady Locomotor Performance and Maneuverability	47.074			$98,289	$148,547
Collaborative Research: Scaling the Early Research Scholars Program	47.076				$26,187
Collaborative Research: SI2¿SSI: A Sustainable Open Source Software Pipeline for Patient Specific Blood Flow Simulation and Analysis	47.070				$55,675

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Year Ended 8/31/2019

Federal Grantor/Federal Program Title	Federal CFDA Number	Pass-Through Entity Name	Pass-Through Entity Identifying Number	Amount Passed through to Sub-Recipients	Total Federal Expenditures
Collaborative Research: SI2-SSI: Removing Bottlenecks in High Performance Computational Science	47.070				$112,125
Collaborative Research: Simulating crack propagation in steel structures under ultra-low cycle fatigue and low-triaxiality loading from earthquakes and other hazards	47.041				$102,247
Collaborative Research: Socially Assistive Robots	47.070			$20,866	$58,560
Collaborative Research: Stanford-Florida program in Support of LIGO on Coatings and Core Optics	47.049				$587,157
Collaborative Research: Structural and functional connectivity of squid chromatophores	47.074			$10,434	$117,765
Collaborative Research: Subgrid-scale models for large-eddy simulation of cloud formation and evolution	47.050			$1,883	$42,595
Collaborative Research: Sunlight Inactivation Mechanisms of Pathogenic Bacteria in Natural Waters	47.041				$3,095
Collaborative Research: Systematic Investigation of the Structure, Dynamics, and Energetics of Hydrogen Bonds and the Protein Interior Using Ketosteroid Isomerase and Model Systems	47.074				$160,651
Collaborative Research: The central Apennines Earthquake cascade under a new microscope	47.050				$61,965
Collaborative Research: The Gemini Planet Imager Exoplanet Survey	47.049				$70,971
Collaborative Research: The genetic, epigenetic, and immunological underpinnings of cancer evolution through treatment	47.049				$103,440
Collaborative Research: The Origin and Role of Dense Molecular Gas in Star-Forming Galaxies	47.049				$54,843
Collaborative Research: The SAGA Project: Satellites around Galactic Analogs	47.049				$66,604
Collaborative Research: Time-Sharing Experiments for the Social Sciences (TESS): Proposal for Renewed Support, 2016-2019	47.075				$146,831
Collaborative Research: Tolerance-Enforced Simulation of Stochastic Processes	47.049				$142,015
Collaborative Research: Tsunami Hazard to West Antarctic Ice Shelves	47.050				$72,077
Collaborative Research: US GEOTRACES PMT: Investigating geochemical tracers of the Pacific nitrogen cycle and budget	47.050			$14,597	$53,414
Collaborative Research: Visual Cortex on Silicon	47.070				$77,234
Collaborative Research: Wave driven flow through a shallow, fringing reef	47.050				$70,927
Collaborative Research: Waves in volcanic conduit-crack systems and very long period seismicity at Kilauea Volcano, Hawaii	47.050				$165
Columbia University Materials Research Science and Engineering Center	47.049	Columbia University	5(GG008600-13)		$39,255
Combinatorial optimization, spin models and the geometry of sparse random graphs	47.049				$73,476
Compositional and Temperature Controls on Structural Order, Dynamics, and Properties of Multicomponent Borosilicate Glasses	47.049				$59,518
Comprehensive Analysis of Transverse Gradient Undulator for Compact X-Ray FELs based on Laser Plasma Accelerators	47.049				$15,035
CompSustNet: Expanding the Horizons of Computational Sustainability	47.070	Cornell University	72954-10597		$34,554
Concentration of Power	47.075	The Pennsylvania State University	5334-SU-NSF-0639		$18,439
Conference Proposal: Automorphic forms on reductive groups and their covers: A conference in honor of Solomon Friedberg	47.049				$9,672
Conference Proposal: Kylerec student workshop in symplectic and contact geometry	47.049				$19,930
Constraints on absolute magma chamber volume from geodetic measurements: Trapdoor faulting in the Galapagos	47.050				$40,903
Consumer Innovation Survey Development	47.075				$24,031
Consumption Network Effects	47.075				$14,737
Controlling the band structure of 2D semiconductors by their dielectric environment	47.049				$207,869
Convergence HTF: Collaborative Research with Ethical, Legal and Social Implications	47.070				$677
CPS: Breakthrough: Collaborative Research: The Interweaving of Humans and Physical Systems: A Perspective From Power Systems	47.070				$159,572
CPS: Breakthrough: Sufficient Statistics for Multi-Agent Systems	47.070				$21,085
CPS: Collaborative: In-Silico Functional Verification of Artificial Pancreas Control Algorithms	47.070	University of Colorado, Boulder	1555131/PO #1000818212		$1,770
CPS: Medium: Collaborative Research: Building Information, Inhabitant, Interaction and Intelligent Integrated Modeling (BI5M)	47.070				$10,321
CPS: Small: Collaborative Research: Models and System-Level Coordination Algorithms for Power-in-the-Loop Autonomous Mobility-on-Demand Systems	47.070				$15,259
CPS: Synergy: Collaborative Research: Enhanced Structural Health Monitoring of Civil Infrastructure Systems by Observing and Controlling Loads using Cyber¿Physical Systems	47.041				$47,074
CPS-Security: Synergy: End-to-End Security for the Internet of Things	47.070				$597
CQIS: A Quantum Electro-Optic Converter	47.041				$52,013
CRCNS: Collaborative Research: Naturalistic computation and signaling by neural populations in the primate retina	47.070				$40,323
Creating a new assessment tool for quantitative critical thinking in introductory lab courses	47.076			$75,069	$83,161
Creep Deformation in Shale at Submicron Scale	47.041				$22,854
CREX(Special creativity two year extension): Microwave Impedance Microscopy Study of Topological Structures of Quantum Systems	47.049				$64,093
CRII: CIF: Locality in Error Correcting Codes: Fundamental Trade-offs	47.070				($1,847)
CRII: III:Algorithms for Causal Inference on Networks	47.070				$54,871
Cross-cultural trust and resource sharing; The Role of Ideal Affect	47.075				$138,606
Crystal orientation and defect control in active and passive plasmonic systems	47.049				$94,493
CSR: Medium: Collaborative Research: GPL: General-Purpose Lambda Computing	47.070				$170,974
CSR:Medium: A Computing Cloud for Graphical Simulation	47.070				$23,504
Cytokinesis without an actomyosin ring: studies in Chlamydomonas	47.074				$299,896
D3SC and EAGER: Using Deep Learning to Find Algorithms for Optimizing Chemical Reactions	47.049				$50,701

STANFORD UNIVERSITY
SCHEDULE OF EXPENDITURES OF FEDERAL AWARDS PART B
SUMMARY OF PROGRAM CLUSTERS
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Federal Grantor/Federal Program Title	Federal CFDA Number	Pass-Through Entity Name	Pass-Through Entity Identifying Number	Amount Passed through to Sub-Recipients	Total Federal Expenditures
Data-driven, biologically constrained biophysical computational model of the hippocampal network at full scale	47.070				($3)
DCL: Synthesis and Design Workshop: Weaving the Fabric of Adaptive STEM Learning Environments Across Domains and Settings	47.076				$57,457
DD: C2STEM: Learning by Modeling: A Collaborative and Synergistic Approach to K-12 Computing and STEM Education	47.076	Vanderbilt University	UNIV 58595		$234,370
Defining the classical and quantum limits of surface plasmon optics with hard-soft nanoantenna systems	47.041				$166,720
Design of self-assembling bio-inks for cell-based 3D printing	47.049				$8,664
Determination of Equilibrium Iron Isotope Fractionation Factors at High Pressure	47.050				$7,711
Development and Comparison of New Methods for Stabilizing Amputee Gait	47.041				$51,561
DFG/NSF: Novel Low Loss Coatings - Enabling the Third Generation of Gravitational-Wave Detectors	47.049				$56,264
Dimensions: Collaborative Research: Assembly and function of nectar microbial communities	47.074				$460,965
Discovering what matters: informative and reproducible variable selection with applications to genomics	47.049				$160,408
Disorder and Dynamics in Silicate and Aluminosilicate Liquids, Glasses, and Crystals Relevant to Geochemical Processes: Nuclear Magnetic Resonance Studies	47.050				$69,436
Dissecting the biogenesis and function of circular RNA in simple eukaryotes	47.074				$195,901
DISSERTATION RESEARCH: Mechanisms of host preference in the ectomycorrhizal symbiosis	47.074				$1,715
DMREF - Collaborative Research: Developing design rules for enhancing mobility in conjugated polymers	47.049				$86,615
DMREF Collaborative Research: Extreme Bandgap Semiconductors	47.049				$62,092
DMREF: Collaborative Research: Accelerating Thermoelectric Materials Discovery via Dopability Predictions	47.049	Colorado School of Mines	401279 - 5801		$58,027
DMREF: Collaborative Research: An integrated multiscale modeling and experimental approach to design fouling-resistant membranes	47.041				$35,091
DMREF: Collaborative Research: Programming mesostructured colloidal soft matter through complex quenching and annealing	47.041				$126,503
DMREF: Collaborative Research: Van der Waals Layered Materials: Building the Knowledge-Base, Synthesis and Characterization Methodologies for the New Frontier in Nanophotonics	47.041				$52,163
Doctoral Dissertation Improvement Grant: Analyzing Backlash against Gender Equity in Organizations	47.075				$2,553
Doctoral Dissertation Research in DRMS: Assessing the effectiveness of a collective efficacy-building approach at motivating resident engagement in invasive species control on private lands	47.075				$568
Doctoral Dissertation Research: Perceptions of College Value in an Era of Growing Female Advantage	47.074				($2)
Doctoral Dissertation Research: Responses to Islamist Political Violence and the Moderates' Dilemma	47.075				$17,936
Doctoral Dissertation Research: Search strategies and collaborative innovation of young firms: A natural experiment	47.RD				$10,048
Doctoral Dissertation Research: The Cultural Meaning of Entrepreneurship: a Comparative Study of the U.S. and China	47.075				$12,000
Doctoral Dissertation Research: The emergence and evolution of cost-benefit analysis in US policymaking	47.075				$6,111
Doctoral Dissertation Research: The social structure of city action: Civic infrastructures as determinants of urban resilience	47.075				$9,767
Doctoral Dissertation Research: Yurok and Karuk Indian Prescribed Burns in Northwest California: Effects on forest dynamics and indigenous resource use	47.075				$814
Does in utero exposure to domoic acid cause temporal lobe epilepsy?	47.050				$61,600
Dynamics of Mesoscopically Structured Molecular Liquids	47.049				$36,585
E2CDA: Type I: Collaborative Research: Energy Efficient Computing with Chip-Based Photonics	47.070				$78,247
E2CDA: Type I: Collaborative Research: Energy Efficient Learning Machines (ENIGMA)	47.070				$167,537
E2CDA: Type II: A new non-volatile electrochemical transistor as an artificial synapse: device scaling studies	47.041				$56,404
E2CDA: Type II: Collaborative Research: Nanophotonic Lithium Niobate platform for next generation energy efficient and ultrahigh bandwidth optical interconnect	47.041				$112,556
EAGER SitS: Can remotely imaged vegetation characteristics provide a window into soil nutrient cycles?	47.050				$147,559
EAGER: A dynamic, reliability-weighted, multi-pass probabilistic framework to reduce uncertainty in crowd-sourced post-disaster damage assessments	47.041				$1,226
EAGER: Design of Generative Product Behavior using Morphing Algorithms	47.041				($788)
EAGER: Determinants of citizen science participation and data quality in coastal water quality monitoring	47.041				$8,730
EAGER: Enabling Quantum Leap: Room-temperature photon blockade and quantum gates using quantum dots in 2D materials	47.049				$138,928
EAGER: Enabling Quantum Leap: Temperature dependence of optical nonlinearities of monolayer transition-metal dichalcogenides	47.049				$238,656
EAGER: Exploring the coupled dynamics of urban systems using data science and micro-experimentation	47.041				$2,345
EAGER: Identifying Opportunities in Pseudorandomness	47.070				($4,359)
EAGER: Particle Concentration Measurements in Turbulent Flows using Magnetic Resonance Imaging	47.041				$18,705
EAGER:TDM Solar Cells: Collaborative Research: 30%-Efficient, Stable Perovskite/Silicon Monolithic Tandem Solar Cells	47.041				$36,807
EDGE: Developing techniques for linking genotype to phenotype in amphibians	47.074			$117,347	$465,955
Effective Preconditioners for High Frequency Wave Equations	47.049				$15,582
Effects of internal waves on mixing and transport by gravity currents	47.050				$128,147

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Federal Grantor/Federal Program Title	Federal CFDA Number	Pass-Through Entity Name	Pass-Through Entity Identifying Number	Amount Passed through to Sub-Recipients	Total Federal Expenditures
Efficient Generation of N-Photon Bundles Using a Solid State Cavity QED System	47.049				($425)
Efficient Monte Carlo algorithms for Bayesian inference	47.049				$49,693
EFRI 2-DARE: Energy Efficient Electronics with Atomic Layers (E3AL)	47.041				$69,472
EFRI ACQUIRE: Distributed Quantum Computation Using Ion Chips and Integrated Photonics	47.041	University of Maryland	52220-Z3075201		$101,521
EFRI NewLAW: CMOS-Compatible Electrically Controlled Nonreciprocal Light Propagation With 2D Materials	47.041	North Carolina State University	2017-1718-03		$136,190
EFRI NewLAW: Engineering Resilient Photonic Structures and Devices with Broken Time-Reversal Invariance	47.041	Washington University in St. Louis	WU-17-126/PO 2928376C		$27,130
EFRI NewLAW: Mid-infrared topological plasmon-polaritons with 2D materials	47.041	University Of Minnesota	A006382203		$254,884
EFRI NewLAW: New frontiers for topologically-protected propagation of light, sound, elastic, and mechanical waves	47.041	University of Texas at Austin	UTA16-000937		$132,305
EFRI NewLAW: Non-reciprocal, topologically protected propagation using atomically thin materials for nanoscale devices	47.041	Emory University	T881192		$236,762
Emerging Frontier of Science Formation	47.070	Purdue University	10000686-017		$330,218
Emerging Materials for Energy storage and environmental Research enabled through Atomic Layer Deposition (EMERALD)	47.041				$178,256
Engineering Three-dimensional Stem Cell Niche with Independently Tunable Biochemical and Mechanical Properties	47.041				$60,031
Enhancing helicity-dependent optical interactions in inversion-asymmetric materials	47.049				$47,592
Establishing the genetic basis of hibernation by building and utilizing a next-generation genomics resource for the model hibernator, the thirteen-lined ground squirrel	47.074				$43,527
Estimation and testing in low rank multivariate models	47.049				$118,304
Estimation of Antarctic Ice Melt Using Stable Isotopic Analyses of Seawater	47.050				$139,760
Evolutionary Dynamics and Diversity in High Dimensions	47.049				$109,765
Experimental Investigation For the Characterization of the Geophysical Response of Rock-Fluid Interactions	47.050				$138,650
Fast Temporal Dynamics of Human Brain Activity During Emotional Processing	47.075				$53,715
FELLOWSHIP: Sustained-Petascale in Action: Blue Waters Enabling Transformative Science and Engineering	47.070	University of Illinois	067846-16996		$50,000
Financial Intermediaries in a Modern Economy: Risk Taking and Liquidity Provision	47.075				$126,822
Flexible Statistical Modeling	47.049				$79,877
Flexible Statistical Modelling	47.049				$96,229
FMitF: Collaborative Research: Track I: Finding and Eliminating Bugs in Operating Systems	47.070				$71,559
FRG: Collaborative Research: Crossing the Walls in Enumerative Geometry	47.049				$146,808
Functional Genomics Tools for Cnidarian-Dinoflagellate Symbiosis	47.074	Oregon State University	S1929A-C		$242,609
Fundamental Physical Understanding of Matrix-stabilized Combustion in Porous Media	47.041				$122,650
Fundamental Studies of the Hydrogen-Atom Hydrogen-Molecule Exchange Reaction	47.049				$121,301
FUSE: Food-water-energy for Urban Sustainable Environments	47.050				$205,504
FW-HTF Theme2:Collaborative Research: Enhancing Human Capabilities through Virtual Personal Embodied Assistants in Self-Contained Eyeglasses-Based AR Systems	47.041				$252,373
GEM: Extending the Capabilities of CubeSats for Measuring Radiation Belt Precipitation	47.050			$24,603	$120,779
Geometric Structure of the Turbulent Cascade	47.041				$105,394
Geometry & Statistics	47.049				$293,261
Geophysics of Iron in the Earth's Core	47.050				$35,551
Global Urbanization and its Discontents: Wide View	47.075	Southern Methodist University	G001723-7505		$81,939
GOALI: SusChem: Organocatalysis: A Platform for Sustainable Polymer Chemistry.	47.049				$200,024
Grain Boundary-Activity Relationships in CO2 Electroreduction Catalysis	47.049				$88,596
Ground Motion Prediction Using Virtual Earthquakes	47.050				$83,363
Health Insurance Competition and Healthcare Costs	47.075				$13,968
Healthy Ecosystems, Healthy People: The Coupled Human Health and Environmental Dynamics of Schistosomiasis in Sub-Saharan Africa	47.075	University of California, Santa Barbara	KK1604		$1,329
Heat Transfer Processes in Rough Microchannels	47.041	University of California, San Diego	92149808/ MP Inv # S9001709		$62,835
Hemichordate neural organization: generating neural system diversity from conserved molecular patterning	47.074				$149,113
High resolution genome changes during evolution in a classic fisheries experiment	47.050			$95	$81
High-energy laser-proton acceleration from cryogenic hydrogen	47.049				$149,072
High-through scalable manufacturing of high-performance organic devices	47.041	University of California, Davis	201602722-01(A17-0377-S)		$36,545
High-Voltage High-Power-Density Power Electronics for Emerging Medical, Environmental, and Aerospace Applications	47.041				$108,456
How much does nest density matter? Using novel technology to collect whole-colony data on Adelie penguins	47.050	Point Blue Conservation Science	1834986		$3,368
IBSS: The Impact of Online Technologies on Interpersonal Communication and Perceptions	47.075	Wayne State University	WSU15138		$21,657
III: Small: Extracting Data and Structure from Charts and Graphs for Analysis, Reuse and Indexing	47.070				$93,109
IIS-RI: ICAPS 2017 Doctoral Consortium Travel Awards	47.070				$2,105
INFEWS/T1: Reducing the Environmental Impacts of FEW Systems In and Around Cities	47.050	University of California, Berkeley	00009606/PO# BB00986334		$26,783
Influencing Conflict-Related Emotional Dynamics	47.075				$86,687
Innovations in Development for a Transformative Scientist-Driven Public Engagement Model: The STEM Ambassador Program	47.076	University of Utah	10037087		$25,354
Insight software for network situational awareness	47.070	University of Tennessee	A16-0202-S002		$11,362

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INSIGT: Investigating Shear-margin Interactions with Grounding-line Transitions	47.050				$123,377
INSPIRE: Architectural principles of coherent quantum networks and circuits	47.049				$110,853
Institute for Advanced Study/Park City Mathematics Institute	47.049	Institute for Advanced Study	7456-2305		$32,739
Integrated Circuit Cracking (ICC) with Linked Tools for Diverse Systems	47.074			$362,085	$1,090,130
Integrated Modeling and Control of Aftertreatment Systems for Clean, Efficient and High-Performing Gasoline Direct Injection Engines	47.041				$147,810
Integrated Simulation of Cloth Mechanics and Appearance for Predictive Virtual Prototyping	47.070	Cornell University	75054-10538		$45,543
Interfacing Spins with Photons: Quantum Many-Body Physics with Non-Local Interactions	47.049				$164,447
International Workshop on Numerical Modeling of Earthquake Motions: Waves and Ruptures	47.050				$7,216
Investigating the Large-Scale Solar Magnetic Field During the Transition to Solar Cycle 25	47.050				$37,882
Investigating the mechanics of cell division with a side-view Atomic Force Microscope	47.041				$26,661
Lanthanide-based probes for visualizing RNAs and proteins in live organisms	47.049				$75
Large Synoptic Survey Telescope (LSST) Project	47.RD	LSST Corporation	N51908C_#6 N51908C		$3,543,324
Laser Control of Quantum Evolution in Molecules	47.049				$227,527
Lattice gauge theories, importance sampling and quantum unique ergodicity	47.049				$72,351
Linking genetic diversity in benthic marine archaea to functional variability	47.083	University of Southern California	87388957 / PO 50708569		$94,670
Manifolds and Moduli Spaces	47.049				($1,592)
Mean Curvature Flow and Minimal Varieties	47.049				$96,722
Measurements of current-phase relationships in Josephson junctions	47.049				$29,718
Medicare Part D: An Analysis of the Supply Side of Incentives	47.075	National Bureau of Economic Research	36010.00.00.00		$5,156
Mental Conditioning and Health: A Cultural and Neurophysiological Study	47.075				$5,931
Methods in Extremal Combinatorics	47.049				$45,394
Microlocal analysis of linear and non-linear problems	47.049				$114,744
Microlocal Methods in Geometric Analysis	47.049				$43,632
Microstructural determinants of ion transport in ion exchange fuel cell membranes	47.041				($2,030)
Modeling Satellite Correlations of Aerosol Optical Depth Versus Cloud Optical Depth Over Megacities	47.050				$12,374
Moduli Problems in Algebraic Geometry, their Structures and their Applications	47.049				$70,402
Molecularly selective sensors based on organic semiconductors and artificial receptors: demonstrations and scaling studies.	47.041				$75,749
Monte Carlo and Quasi-Monte Carlo Methods for Statistics	47.049				$3,095
Moving from correlation to mechanism: testing the role of temperature and oxygen change in the Great Ordovician Biodiversification Event	47.050				$12,063
MRI: Collaborative Development of Sample Delivery Instrument for Femtosecond Diffraction Studies	47.074				$368,227
MRI: Development of a 150 GHz Receiver for the BICEP Array CMB Polarimeter	47.050	California Institute of Technology	S401848		$262,656
MSIP: Innovation to Achieve the Full Science Reach of the BICEP Array Stage 3 CMB Polarization Experiment	47.049			$264,149	$638,396
Multi-Physics Models for Proppant Placement in Energy Georeservoirs	47.041	University of California, San Diego	90882852		$16,669
Multivariate histograms and inference with finite sample guarantees	47.049				$34,550
Nanostraw-mediated Primary Immune Cell Reprogramming	47.RD	Navan Technologies, Inc.	1759075		$164,068
National Science Foundation's Alan T. Waterman Award	47.041				$45,691
NeTS: Large: Collaborative Research: GigaNets: A Path to Experimental Research in Millimeter Wave Networking	47.070				$48,120
NeTS: Small: Collaborative Research: A Fast and Flexible Transport Architecture for High Speed Networks	47.070				$4,406
NeTS: Small: Massive Wireless Random Access: Principles and Protocols	47.070				$82,152
NeTS:SMALL:Video-Aware Network Transport + Network-Aware Video Coding	47.070				($541)
Neural investigations of face perception and attention using population receptive field modeling	47.075				$175,955
New Algorithms for Computing Equilibria of Stochastic Games	47.075	New York University	F8793-01/SES-1756215		$69,768
New Approaches to Reversible Homogeneous Electrocatalysts	47.049				$144,664
New Inks for 3D Bio-Printing based on Bio-orthogonal Click Chemistry	47.049				$179,646
NHERI Computational Modeling and Simulation Center	47.041	University of California, Berkeley	00009369 PO#BB00824561		$237,630
Nitrogen Fixation in Deep-Sea Sediments	47.050				$23,233
NNCI: Stanford Nano Shared Facilities	47.041				$1,345,664
Non-uniform sampling of permutations and large scale hypothesis testing	47.049				$83,452
Norovirus persistence in surface water	47.041				$3,771
Novel Chemistries for Nanoscale Surface Functionalization by Molecular Layer Deposition	47.049				$90,563
NRI: Balance Recovery Control for Amputees using Powered Leg Prostheses	47.070	Carnegie Mellon University	1122353-393882		$52,501
NRI: Collaborative Research: Versatile Locomotion with a Human-Scale Climbing Robot	47.070				$57,148
NRI: FND: COLLAB: Distributed Semantically-Aware Tracking and Planning for Fleets of Robots	47.070				$36,035
NRI: FND: COLLAB: Intuitive, Wearable Haptic Devices for Communication with Ubiquitous Robots	47.041				$198,314
NRI: INT: COLLAB: SYNDROME: SYNergetic DROne Delivery Network in Metropolis	47.041				$8,456
NRI: INT: Individualized Co-Robotics	47.041	Carnegie Mellon University	1122591-399765		$150,147

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NRI: Liquid Handling Robots - A New Paradigm for STEM Education	47.041			$45,938	$105,870
NRI: Vine Robots: Achieving Locomotion and Construction by Growth	47.041			$121,893	$565,727
NRT: NeuroTech - Bringing Technology to Neuroscience	47.076				$90,008
NSF CAREER: The Effects of Public Policy on Families with Children: New Evidence from Multiple Large-Scale Data Sets	47.075				$48,216
NSF CAREER: Within City, Across Seasons or Across Borders: The Economics of Labor Movements	47.075				$114,843
NSF CBET: Stress formation and relaxation in colloidal dispersions: transient, nonlinear microrheology	47.041				$24,123
NSF Center for Power Optimization for Electro-Thermal Systems (POETS)	47.041	University of Illinois	2014-00555-03 073708-16479 (REU) 03708-16480 (RET) 088653-16967 (REU)		$713,129
NSF Engineering Research Center for Re-Inventing America's Urban Water Infrastructure	47.041			$1,980,744	$3,639,913
NSF Experimental Atomic Molecular and Optical Physics	47.049				($426)
NSF/ENG/ECCS-BSF: Sensing and Estimation under Energy and Communication Constraints	47.041				$82,647
NSF-BSF: SHF: Small: Certifiable verification of large neural networks	47.070				$51,455
NSFDEB-BSF: Collaborative Research: The fitness cost of every single mutation in the HIV genome	47.074				$33,611
NSFGEO-NERC: Collaborative Research: Energy transfer between submesoscale vortices and resonantly-forced inertial motions in the northern Gulf of Mexico	47.050				$58,210
NSFPLR-NERC: The Future of Thwaites Glacier and its Contribution to Sea-level Rise	47.050	University of California, Santa Cruz	A18-0296-S004-P0668401		$63,777
NSFPLR-NERC: TIME - Thwaites Interdisciplinary Margin Evolution - The role of shear margin dynamics in the future evolution of Thwaites drainage basin	47.050	University of California, Santa Cruz	A18-0296-S002-P0668511		$37,718
One-Dimensional Gases of Dysprosium	47.049				$124,139
OP: Collaborative Research: Highly Integrable Thin-Film Periodically Poled Lithium Niobate (TF-PPLN) Platform for Advanced Nonlinear Nanophotonics	47.041				($24)
Optical scale laser-driven electron accelerators for attosecond radiation sources	47.049				$1,246
Optomechanical antennas for silicon photonic beam-steering	47.041				$175,969
OPUS: Historical contingency in community assembly	47.074				$2,170
Organization and Dynamics in Photosynthetic Reaction Centers and Model Membrane Architectures	47.074				$247,941
OUT OF THE BOX AND INTO THE CLOUD: STRATEGIC PLANNING AT JASPER RIDGE BIOLOGICAL PRESERVE	47.074				($376)
Pathways from School to Work (PATHS): A Longitudinal Study of Undergraduate Engineering Students from College into the Workforce	47.041				$64,606
Physics-based Scale Enrichment for Eddy-Resolving Turbulence Simulations	47.041				$47,619
Physics-Based Volcano Geodesy with Application to Effusive Eruptions at Mount St Helens	47.050				$20,010
Physiological adaptions for a deadly diet: Bioaccumulation mechanisms of defensive chemicals in a poison frog	47.074				$214,171
Planning Grant: Engineering Research Center for Data for Socio-Physical Extreme Event Resilience (Data-SPEER)	47.041				$93,158
POLITICAL VIOLENCE AND STATE REPRESSION	47.075				$121,231
Postdoctoral Fellowship: The Changing Interface between Data, Theories and Communities in Neuroimaging Research	47.075				$99,287
Prediction of solar eruptions with machine-learning algorithms combining physical models and observations	47.050				$6,851
Properties of approximate inference for complex high-dimensional models	47.049				$63,685
Quantifying Uncertainties in Computational Fluid Dynamics predictions for Wind Loads on Buildings: GOALI Supplement	47.041				$153,620
Quantum chaos and quantum gravity from entanglement	47.049				$105,016
Q-WHIRL: Quantifying Wind Hazard Interference effects in ReaL urban environments	47.041				$32,426
Radiocarbon Dating and Chronological Modelling of Neolithic Çatalhöyük East	47.075				$20,668
RAISE: TAQS: Engineering high quality, practical qubits in diamond	47.041			$3,713	$153,854
RAISE: TAQS: Inverting the design paradigm: Tunable qubits in hybrid photonic materials as a scalable platform for quantum photonic devices	47.041	University of Delaware	51696		$138,887
Random and Adaptive Projections for Scalable Optimization and Learning	47.070	University of Michigan	SUBK00009902/PO 3005179870		$112,804
Rapid Simultaneous Nucleic Acid Purification and Sequence-Specific Detection on a Handheld Printed Circuit Board Platform	47.041	University of California, Irvine	2014-3092		($26)
Reducing Attrition in STEM Doctoral Education: A Longitudinal Investigation using Momentary Assessment and Social Psychological Intervention.	47.076	The Pennsylvania State University	5664-SU-NSF-1214		$107,033
Refining a Model with Tools to Develop Math PD Leaders: An Implementation Study	47.076				$569,907
REGULATORY HIERARCHIES AND ROLES OF NON-CODING RNAs IN MAIZE ANTHERS	47.074	Donald Danforth Plant Science Center	23905-S		$145,614
Representations of Reductive Groups and Etale Hessenberg Varieties	47.049				$13,358
Research in Particle Theory, Cosmology, and Quantum Gravity	47.049				$836,157
Research Initiation: The Role of Internships in Developing Engineering Professional Identity for First Generation Low-Income Students	47.041	Elizabethtown College	SPO 135849		$6,727
RET Site: Teaching Engineering Design & Innovation	47.041				$177,141
REU Site: Language, Computation, and Cognition	47.075				$118,407
REU Site: Re-Inventing the Nation's Urban Water Infrastructure (ReNUWIt)	47.041			$68,296	$68,296
RI: Medium: Collaborative Research: Object-Centric Inference of Actionable Information from Visual Data	47.070				$41,646
RI: Medium: Deep Reading: Integrating Neural and Symbolic Models of Meaning	47.070				$97,468
RI: Small: Deriving and Exploiting Shape Semantics	47.070				$142,498

STANFORD UNIVERSITY
SCHEDULE OF EXPENDITURES OF FEDERAL AWARDS PART B
SUMMARY OF PROGRAM CLUSTERS
Year Ended 8/31/2019

Federal Grantor/Federal Program Title	Federal CFDA Number	Pass-Through Entity Name	Pass-Through Entity Identifying Number	Amount Passed through to Sub-Recipients	Total Federal Expenditures
RI:Medium: Collaborative Research: Incorporating Biologically-Motivated Circuit Motifs into Large-Scale Deep Neural Network Models of the Brain	47.070				$176,125
RIDIR: Integrated Media Database and Computational Tools for Multimodal Analysis of Inter-media News Flow and Agenda Setting in Mass and Social Media	47.075				$45,289
RNMS: Geometric Structures and Representative Varieties	47.049				$18,038
Robust and Low-cost Smart Skin with Active Sensing Network for Enhancing Human-Robot Interaction	47.070				$316,183
Robust machine learning methods for messy data	47.070				$46,626
RoL: EAGER: DESYN-C Spontaneously Synthesized RNA Protocells for Biological Catalysis	47.041				$37,069
Role of tomato bHLH transcription factors in development and immunity	47.074				$228,886
RUI: COLLABORATIVE RESEARCH: BUILDING A MECHANISTIC UNDERSTANDING OF WATER COLUMN CHEMISTRY ALTERATION BY KELP FORESTS: EMERGING CONTRIBUTIONS OF FOUNDATION SPECIES	47.050				$44,173
S&CC-IRG Track 2: Smart & Connected Kids for Sustainable Energy Communities	47.070	Oregon State University	S1977A-A		$147,897
S2I2: Institute for Research and Innovation in Software for High Energy Physics (IRIS-HEP)	47.070	Princeton University	SUB0000280		$11,388
SaTC: CORE: Frontier: Collaborative: End-to-end Trustworthiness of Machine-Learning Systems	47.070				$162,661
SaTC: CORE: Medium: Collaborative: An algebraic approach to secure multilinear maps for cryptography	47.070				$32,000
SaTC-EDU: EAGER: Cybersecurity education for makers of public policy	47.076				$191,041
SBE: Medium: Collaborative: Understanding and Exploiting Viceral Roots of Privacy and Security Concerns	47.075				$2,595
SCEC5 Research Collaboration at Stanford University	47.050	University of Southern California	91270823 / PO 10617840		$324,571
SCH: INT: Collaborative Research: A Non-invasive and Wearable Molecular Diagnostic Platform for Remote and Passive Monitoring of Patients at Risk for Sepsis	47.070				$46,293
Searching for Dark Matter Subhalos in Distant Strong Gravitational Lenses	47.049				$75,619
Seeking Synergy Between Technological and Ecological Systems for Sustainable Engineering	47.041			$18,615	$18,615
SEES Fellows: Building Informatics: Utilizing Data-Driven Methodologies to Enable Energy Efficiency and Sustainability Planning of Urban Building Systems	47.070				$105,039
SemiSynBio: Highly scalable random access DNA data storage with nanopore-based reading	47.RD				$289,439
Sensorimotor neural oscillations and social personality correlates for perception and performance of musical joint-action tasks	47.075				$6,517
SHF: Medium: Collaborative Research: From Volume to Velocity: Big Data Analytics in Near-Realtime	47.070				$55,354
SHF: Medium:PRISM: Platform for Rapid Investigation of efficient Scientific-computing & Machine-learning	47.070				$279,997
SHF:Medium:Stochastic Program Optimization	47.070				$135,574
Shock Tube Measurements of Aldehyde and Ketone Rate Constants Using Enhanced Laser Absorption	47.041				$35,149
SI2-SSI Collaborative Research: The SimCardio open source multi-physics cardiac modeling package	47.070				$334,528
Singularities in General Relativity	47.049				$50,937
Solute Trapping in Low-Temperature Vapor-Liquid-Solid Growth: A Route to Direct-Gap Ge-Sn Single Crystal Nanowires	47.049				$82,663
Solving the Equation: Recruiting, Hiring, and Retaining Math and Science Teachers	47.075			$265,479	$300,479
Spatiotemporal measurements of the Kondo cloud	47.049				$10,174
Spectroscopic Elucidation of Cu and Fe Active Sites in Zeolites	47.049				$152,446
Spin Functionality in Perovskite Stannates Through Complex Oxide Heteroepitaxy	47.049				$135,795
Spokes: MEDIUM: WEST: Breaking down barriers for reproducible neuroimaging data analyses	47.070				$131,829
SRC-NEEDS Partnership: Stanford November 11, 2012	47.041	Purdue University	4101-54690		($51)
Standard Grant: Glass Ceilings to Diversity	47.075				$81,651
Stanford Institute for Theoretical Economics Summer Workshop	47.075				$85,544
Stanford Program in Support of LIGO - Seismic Isolation and Controls	47.049				$481,035
Statistical Methodology and Applications to Engineering and Economics	47.049				$106,061
Statistical Theory and Methodology	47.049				$108,091
STEP Center: EHR-ENG STEP Innovation Center	47.076			($1,413)	($1,413)
Structural architecture and evolution of the southern flank of the Brooks Range fold and thrust belt, Arctic Alaska	47.050				$33,125
Structural Dynamics of Ribosome Complexes By Using Time-resolved Serial Femtosecond X-ray Kinetic Crystallography	47.074	Hauptman-Woodward Medical Research Institute	6229		$23,937
Structure/Function Correlations Over Binuclear Non-Heme Iron and Related Enzymes	47.074				$83,215
Structure-property relationships in novel conjugated mixed conductors	47.049				$103,028
Subcontract from Yale for Rhiju Das	47.049	Yale University	GR104446(CON-80001438)		$63,782
Submesoscale instabilities near the sea-floor and their effects on the ocean circulation and mixing	47.050				$168,023
Superconductor-(Metal)-Insulator Transitions: Understanding the Emergence of Anomalous Metallic States	47.049				$180,152
Surface elevation history of the northern North America Cordillera as constraint for Eocene tectonic and climatic boundary conditions	47.050				$84,411
Symplectic Topology of Weinstein manifolds and related topics	47.049				$43,374
Symposium: 50 Years of Radioglaciology	47.050				$19,522
Synthesis and Analysis of Heap Data Structures	47.070				$121,241
Systems for Assisting in Emotion Regulation in the Wild	47.070				$34,132
Syzygies, Moduli Spaces and Brill-Noether Theory	47.049				$48,660

STANFORD UNIVERSITY
SCHEDULE OF EXPENDITURES OF FEDERAL AWARDS PART B
SUMMARY OF PROGRAM CLUSTERS
Year Ended 8/31/2019

Federal Grantor/Federal Program Title	Federal CFDA Number	Pass-Through Entity Name	Pass-Through Entity Identifying Number	Amount Passed through to Sub-Recipients	Total Federal Expenditures
Tensor hypercontraction for electronic structure and first principles molecular dynamics	47.049				$54,301
Tensor Network Computation: Representations, Algebra, and Applications	47.049				$55,772
The 2019 HRI Pioneers Workshop at the 2019 ACM/IEEE International Conference on Human-Robot Interaction	47.070				$20,084
The Cultural Life of Communism in Kerala	47.075				$2,436
The Genetic, Epigenetic & Immunological Underpinnings of Cancer Evolution through Treatment	47.RD	Memorial Sloan-Kettering Cancer Center	SU2C 2015-003 / PO: BD519953		$32,775
The Hopkins Microbiology Course	47.074				$6,754
The Rheology of Complex Suspensions In Viscoelastic Suspending Fluids	47.041				$283,083
The Role of Catalyst Microstructure in Gas Diffusion Electrosynthesis of C2+ Products	47.049				$36,757
THE ROLE OF NON-CODING RNA IN THE MODULATION OF ANTHER & POLLEN DEVELOPMENT IN GRASSES	47.074	Donald Danforth Plant Science Center	23908-S		$346,613
The Social Value of Financial Expertise	47.075				$32,134
The Structure of the Gromov-Witten Invariants	47.049				$37,896
The SuperCDMS SNOLAB Experiment	47.049	University of California, Berkeley	00008790 PO# BB00544128		$1,338,203
The Welfare Effects of E-Commerce and Entry in U.S. Retail	47.075				$178,883
Theoretical modeling of protein-driven chromosomal dynamics and biological function	47.049				$78,015
Theory of order and fluctuations in quantum materials	47.049				$171,422
Thermo-Mechanics and Hydrology of Western Antarctic Ice Stream Margins	47.050	Harvard University	123844-5093242		$54,705
Three-Dimensional Crack Propagation Algorithms Based on Universal Meshes and their Application to Fracking	47.041				$140,622
THz Driven Electron Gun	47.049				$101,438
To provide leadership and ensure the vitality of the Nation's science, technology, engineering and mathematics (STEM) education enterprise	47.076				$19,643,716
Topics in Number Theory	47.049				$84,185
Toward the Design and Control of Dynamical Transport Barriers in Nonlinear Flow	47.041				$101,575
Towards the border of symplectic rigidity and flexibility	47.049				$4,912
Transport of Non-Spherical Particles in Wavy Flows	47.041				$140,931
TRAVEL: Travel to Workshop on Behavioral Risk Modeling for Pandemic Prevention and Response	47.075				$2,781
TRIPODS+X:RES: Collaborative Research: The Future of the Road - A Data-Driven Redesign of the Urban Transit Ecosystem	47.049				$10,410
TWC: Frontier: Collaborative:CORE: Center for Obfuscation Research	47.070				$93,545
TWC:Small:Collaborative: Computation and Access Control on Big Multiuser Data	47.070				($55)
Two Higgs are Better than One: Investigating Electroweak Symmetry Breaking at the LHC and Beyond with Real-Time Charged Particle Reconstruction	47.049				$202,254
Two-dimensional KPZ evolution, fluctuation lower bounds, and ultrametricity	47.049				$56,678
Two-Dimensional Synthetic Quantum Matter	47.049				$51,241
U.S. ATLAS Operations: Discovery and Measurement at the Energy Frontier	47.049	Stony Brook University, State University of New York	76749/1136652/2		$126,108
Uncertainty Quantification and Bayesian Updating in Data-Driven Cardiovascular Modeling	47.041			$3,838	$163,307
Understanding Gravity at the Smallest Scale	47.049				$154,316
Understanding neurodegeneration across the scales	47.041				$52,127
Understanding the Link Between Structure, Processing and Electronic/Ionic Properties in Soft Mixed Conductors	47.049				($261)
Understanding the productivity of the world's most numerous firms: evidence from surveys and satellites	47.075				$7,453
Unique Functionals and Quantum Groups	47.049				$25,857
United States-Japan Polymer Symposium: "Macromolecules: Challenges and Opportunities for the 21st Century."	47.049				$5,080
UNS: Collaborative Research: Multiscale interactions between active particles and stratified fluids during collective vertical migration	47.041				$2,938
VEC: Small: Collaborative Research: The Visual Computing Database: A Platform for Visual Data Processing and Analysis at Internet Scale	47.070				$45,915
Virtual Solar Observatory Development	47.049	Association of Universities for Research in Astronomy	N94531C-N		$39,476
Visitor Interactions in Microbiology: A New Genre of Science Museum Exhibits	47.041			$38,774	$40,554
Waves and fronts in heterogeneous media	47.049				$112,151
WERF, WRF: Collaborative Research:Quantifying the Contribution of Disinfection Byproducts to the Toxicity of Wastewaters Purified for Potable Reuse: Which Byproduct Classes Matter?	47.041				$50,973
Workshop on the future of coastal and estuarine modeling	47.050				$1,427
Workshop: Advances in asymptotic probability	47.049				$35,000
Workshop: Localizing Representations in the Brain with Neuroimaging Technologies	47.075				$20,417
Social Security Administration					**$44,999**
Working trajectories, health, and patterns of disability and retirement	96.007	Boston College	5002112-BC18-S2		$44,999
U.S. Agency for International Development					**$374,434**
Asili Project Evaluation in the Democratic Republic of Congo	98.RD	American Refugee Committee	AID-OAA-14-00060 (Asili)		($6,667)
Strengthening Facilities for Health - Cambodia	98.001	University Research Corporation	FY14-A05-7017		$11,774
System-scale planning to support sustainable energy systems and conservation of freshwater resources for people and nature	98.RD	WORLD WILDLIFE FUND	1224330-200-AABYU		$16,441
USAID Bureau for Food Security	98.001	The College of William and Mary in Virginia	740681-74171D		$352,886

STANFORD UNIVERSITY
SCHEDULE OF EXPENDITURES OF FEDERAL AWARDS PART B
SUMMARY OF PROGRAM CLUSTERS
Year Ended 8/31/2019

Federal Grantor/Federal Program Title	Federal CFDA Number	Pass-Through Entity Name	Pass-Through Entity Identifying Number	Amount Passed through to Sub-Recipients	Total Federal Expenditures
OTHER FEDERAL AWARDS					**$3,350,934**
Department of Defense (DOD)					**$95,018**
Stanford University/CWLP Mandarin Student Program	12.900				$12,891
STARTALK Teacher: Stanford University Teacher Leadership Seminar	12.900				$38,469
STARTALK University Teacher Leadership Seminar	12.900				$43,658
Department of Education					**$1,585,338**
2018 CLAS NRC-FLAS Application	84.015A				$116,603
2018 CLAS NRC-FLAS Application	84.015B				$206,367
2018 NRC-FLAS Application	84.015A				$158,376
2018 NRC-FLAS Application	84.015B				$266,359
Aftershock: Aid, Ebola, and Civil Society in West Africa	84.022A				$11,008
California Mathematics Readiness Challenge Initiative	84.367B	California State University Monterey Bay	170306-5048301A-C-A		$7,124
IES FY 2014 Predoctoral Training	84.305B				$769,425
Mission Promise Neighborhood Evaluation	84.215	Mission Economic Development Agency	110547		$5,314
National Resource Centers Program and Foreign Language and Area Studies Program	84.015B				($1,898)
NATIONAL RESOURCE CENTERS PROGRAM CFDA NO. 84.015A & FOREIGN LANGUAGE AND AREA STUDIES FELLOWSHIPS PROGRAM CFDA No. 84.015B	84.015B				$500
Stanford World Language Project ESSA 2018-2019	84.367A	University of California Office of the President	ESSA 2018-2019		$46,160
Department of Energy (DOE)					**$29,662**
Intelligence Community Postdoctoral Research Fellowship Program	81.U03				$3,835
Next Generation Printable and Low Power Flexible Organic Transistors based on the Electric Double-Layer Capacitance Effect and Active Layer Blending	81.U02				$15,829
Scalable Integration of Domain Knowledge into Machine Learning via Multi-modal Data Programming and Automated Model Selection	81.U04				$9,998
Department of Health and Human Services (DHHS)					**$174,952**
Cognitive Behavioral Therapy for Psychosis (CBTp) Training for ETCH: Extended Consultation & Train the Trainer	93.958	Network180	E2020214600		$12,601
Prevention Policy Modeling Lab	93.084	Harvard University	116532-5107227		$162,351
Department of Interior					**$15,568**
Office of Redress Administration (ORA) Oral History Project	15.933				$15,568
Department of State					**$764,334**
Afghanistan Legal Education	19.703			$273,512	$764,334
Environmental Protection Agency					**$34,344**
ee360 Leadership and Training Collaborative: Building a Stronger and More Inclusive Movement (year 3)	66.950	North American Association for Environmental Education	NT-83695801-1		$34,344
Library of Congress					**$145,100**
Teaching with Primary Sources	42.002				$141,541
The ALSOS Mission Film Preservation Project Part II	42.U01	National Film Preservation Foundation	FED17-013		$3,559
National Archives & Records Administration					**$185,507**
Martin Luther King, Jr., Papers Project	89.003				$185,507
National Endowment for the Arts and Humanities					**$201,820**
Martin Luther King, Jr., Papers Project	45.161				$105,359
Stanford University Archaeology Collections Inventory Project	45.301				$96,461
U.S. Agency for International Development					**$119,291**
Mexico Clean Economy 2050: Carbon Policy & Innovation for the Energy Transition and Smarter Growth	98.001				$119,291

STANFORD UNIVERSITY
SCHEDULE OF EXPENDITURES OF FEDERAL AWARDS PART B
SUMMARY OF PROGRAM CLUSTERS
Year Ended 8/31/2019

Federal Grantor/Federal Program Title	Federal CFDA Number	Pass-Through Entity Name	Pass-Through Entity Identifying Number	Amount Passed through to Sub-Recipients	Total Federal Expenditures
STUDENT FINANCIAL AID CLUSTER					**$87,905,685**
Department of Education					**$87,795,814**
Federal Direct Student Loan Program - PLUS Loans - Graduate and Parent - New Loans Issued	84.268				$23,716,681
Federal Direct Student Loan Program - Subsidized Stafford Loans - New Loans Issued	84.268				$869,749
Federal Direct Student Loan Program - Unsubsidized Stafford Loans - New Loans Issued	84.268				$20,819,285
Federal Perkins Loan Program - Administrative Allowance	84.038				$0
Federal Perkins Loan Program - New Loans Issued	84.038				$0
Federal Perkins Loan Program - Outstanding Balance as of 09/01/2018	84.038				$33,777,707
Federal Work Study FY17-18	84.033				$306,847
Federal Work Study FY18-19	84.033				$1,115,313
Federal Work Study FY19-20	84.033				$372,436
PELL FY17-18	84.063				$494
PELL FY18-19	84.063				$5,606,365
SEOG FY17-18	84.007				($314,406)
SEOG FY18-19	84.007				$1,282,585
TEACH FY18-19	84.379				$196,508
TEACH FY19-20	84.379				$46,250
Department of Health and Human Services (DHHS)					**$109,871**
DHHS - Loans for Disadvantaged Students - New Loans Issued	93.342				$0
DHHS - Loans for Disadvantaged Students - Outstanding Balance as of 09/01/2018	93.342				$109,871
Grand Total					**$834,228,293**

Schedule of Expenditures of Federal Awards
Part C, Federal Loan Program Year End Balances

STANFORD UNIVERSITY
SCHEDULE OF EXPENDITURES OF FEDERAL AWARDS PART C
FEDERAL LOAN PROGRAMS
Year Ended 8/31/2019

Federal Grantor	Federal Program Title	Federal CFDA Number	Outstanding Balance as of 8/31/2019
Department of Education	Federal Perkins Loan Program - Outstanding Balance	84.038	$24,502,447
Department of Health and Human Services (DHHS)	DHHS - Loans for Disadvantaged Students - Outstanding Balance	93.342	$52,168
Grand Total			**$24,554,616**

Stanford University
Notes to the Schedule of Expenditures of Federal Awards
Year Ended August 31, 2019

1. Basis of Presentation

The accompanying Schedule of Expenditures of Federal Awards (the "Schedule") Part A, Expenditure Detail, Part B, Summary of Programs Clusters, Part C, Federal Loan Program Year End Balances, has been prepared in accordance with the requirements of Title 2 U.S. *Code of Regulations* Part 200, *Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards* (Uniform Guidance). Therefore, amounts presented in the Schedule may differ from amounts presented in, or used in the preparation of, The Leland Stanford Junior University ("Stanford") financial statements, as they relate to the various federal loan programs, as well as other awards. The purpose of the Schedule is to present a summary of those activities by Stanford for the year ended August 31, 2019 that have been financed by the U.S. Government ("federal awards").

Consistent with the provisions of Uniform Guidance, the Schedule does not include expenditures of SLAC National Accelerator Laboratory that were funded by Department of Energy ("DOE") contract. SLAC National Accelerator Laboratory, a national laboratory operated and managed by Stanford under contract directly with DOE, represents a government-owned, contractor operated ("GOCO") facility. GOCOs are excluded from the provisions of the Uniform Guidance.

Stanford applies its predetermined approved facilities and administrative rate when charging indirect costs to federal awards rather than the 10% de minimis cost rate as described in Section 200.414 of Uniform Guidance.

The accompanying Schedule has been prepared on the accrual basis of accounting, which is consistent with Stanford's financial statements. Catalog of Federal Domestic Assistance ("CFDA") and pass-through numbers are provided when available. Negative amounts presented as expenditures represent subsequent period adjustments, transfers or vendor credits.

2. Loan Programs

The federal student loan programs listed in the Schedule above are administered directly by the University and balances and transactions relating to these programs are included in Stanford's consolidated financial statements. Included within the Schedule Part A and Part B are the loan beginning balances, new loans and administrative cost allowances from the Perkins Loans Program and Loans for Disadvantaged Students. Included within the Schedule Part C are the loan balances for the year ended August 31, 2019.

3. Programs Excluded from Subpart F- Audit Requirements

Included in the Schedule Part A, Expenditure Detail, and Part B, Summary of Programs Clusters, is the Education Research Training grant, CFDA 84.305B, from the U.S. Department of Education; with $769,425 total expenditures. This grant is excluded from audit requirements under Subpart F of Title 2 *U.S. Code of Regulations* Part 200.

II. Internal Control and Compliance

Report of Independent Auditors on Internal Control Over Financial Reporting and on Compliance and Other Matters Based on an Audit of Financial Statements Performed in Accordance with *Government Auditing Standards*

To the Board of Trustees of the
Leland Stanford Junior University

We have audited, in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, the consolidated financial statements of the Leland Stanford Junior University and its subsidiaries ("Stanford"), which comprise the consolidated statement of financial position as of August 31, 2019, and the related consolidated statements of activities and cash flows for the year then ended, and the related notes to the financial statements, and have issued our report thereon dated December 3, 2019.

Internal Control Over Financial Reporting

In planning and performing our audit of the financial statements, we considered Stanford's internal control over financial reporting ("internal control") to determine the audit procedures that are appropriate in the circumstances for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of Stanford's internal control. Accordingly, we do not express an opinion on the effectiveness of Stanford's internal control.

A *deficiency in internal control* exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A *material weakness* is a deficiency, or a combination of deficiencies, in internal control such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis. A *significant deficiency* is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

Compliance and Other Matters

As part of obtaining reasonable assurance about whether Stanford's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts and grant agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

Purpose of this Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the entity's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the entity's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.

PricewaterhouseCoopers LLP

December 3, 2019

Report of Independent Auditors on Compliance with Requirements That Could Have a Direct and Material Effect on Each Major Program and on Internal Control over Compliance in Accordance with the Uniform Guidance

To the Board of Trustees of the
Leland Stanford Junior University

Report on Compliance for Each Major Federal Program

We have audited the Leland Stanford Junior University and its subsidiaries' ("Stanford") compliance with the types of compliance requirements described in the *OMB Compliance Supplement* that could have a direct and material effect on each of Stanford's major federal program for the year ended August 31, 2019. Stanford's major federal program is identified in the summary of auditor's results section of the accompanying schedule of findings and questioned costs.

Management's Responsibility

Management is responsible for compliance with federal statutes, regulations and the terms and conditions of its federal awards applicable to its federal programs.

Auditors' Responsibility

Our responsibility is to express an opinion on compliance for each of Stanford's major federal programs based on our audit of the types of compliance requirements referred to above. We conducted our audit of compliance in accordance with auditing standards generally accepted in the United States of America; the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States; and the audit requirements of Title 2 U.S. *Code of Federal Regulations* Part 200, *Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards* (Uniform Guidance). Those standards and the Uniform Guidance require that we plan and perform the audit to obtain reasonable assurance about whether noncompliance with the types of compliance requirements referred to above that could have a direct and material effect on a major federal program occurred. An audit includes examining, on a test basis, evidence about Stanford's compliance with those requirements and performing such other procedures as we considered necessary in the circumstances.

We believe that our audit provides a reasonable basis for our opinion on compliance for each major federal program. However, our audit does not provide a legal determination of Stanford's compliance.

Opinion on Each Major Federal Program

In our opinion, the Leland Stanford Junior University complied, in all material respects, with the types of compliance requirements referred to above that could have a direct and material effect on each of its major federal programs for the year ended August 31, 2019.

Report on Internal Control Over Compliance

Management of Stanford is responsible for establishing and maintaining effective internal control over compliance with the types of compliance requirements referred to above. In planning and performing our audit of compliance, we considered Stanford's internal control over compliance with the types of requirements that could have a direct and material effect on each major federal program to determine the auditing procedures that are appropriate in the circumstances for the purpose of expressing an opinion on compliance for each major federal program and to test and report on internal control over compliance in accordance with the Uniform Guidance, but not for the purpose of expressing an opinion on the effectiveness of internal control over compliance. Accordingly, we do not express an opinion on the effectiveness of Stanford's internal control over compliance.

A *deficiency in internal control over compliance* exists when the design or operation of a control over compliance does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, noncompliance with a type of compliance requirement of a federal program on a timely basis. A *material weakness in internal control over compliance* is a deficiency, or combination of deficiencies, in internal control over compliance, such that there is a reasonable possibility that material noncompliance with a type of compliance requirement of a federal program will not be prevented, or detected and corrected, on a timely basis. A *significant deficiency in internal control over compliance* is a deficiency, or a combination of deficiencies, in internal control over compliance with a type of compliance requirement of a federal program that is less severe than a material weakness in internal control over compliance, yet important enough to merit attention by those charged with governance.

Our consideration of internal control over compliance was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control over compliance that might be material weaknesses or significant deficiencies. We did not identify any deficiencies in internal control over compliance that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

The purpose of this report on internal control over compliance is solely to describe the scope of our testing of internal control over compliance and the results of that testing based on the requirements of the Uniform Guidance. Accordingly, this report is not suitable for any other purpose.

PricewaterhouseCoopers LLP

May 20, 2020

III. Audit Findings and Questioned Costs

Stanford University
Schedule of Findings and Questioned Costs
August 31, 2019

Section I – Summary of Auditor's Results

Consolidated Financial Statements

Type of auditor's report issued:	Unmodified
Internal control over financial reporting:	
Material weakness(es) identified?	No
Significant deficiency(ies) identified that are not considered to be material weaknesses?	None reported
Noncompliance material to financial statements noted?	No

Federal Awards

Internal control over major programs:	
Material weakness(es) identified?	No
Significant deficiency(ies) identified that are not considered to be material weaknesses?	None reported
Type of auditor's report issued on compliance for major programs:	Unmodified
Any audit findings disclosed that are required to be reported in accordance with 2 CFR 200.516(a)?	No

Identification of major programs:

CFDA Number(s)	Name of Federal Program or Cluster
Various	Research and Development Cluster

Dollar threshold used to distinguish between Type A and Type B programs:	$3,000,000
Auditee qualified as low-risk auditee?	Yes

Section II – Financial Statement Findings

None noted.

Section III – Findings and Questioned Costs for Federal Awards

None noted.

Stanford University
Summary Schedule of Prior Audit Findings
August 31, 2019

Finding 2018-001 - Enrollment Reporting

Cluster: Student Financial Assistance
Federal Agency: Department of Education
CFDA#: 84.063, 84.268
CFDA Title: Federal Pell Grant Program, Federal Direct Student Loans
Award Year: September 1, 2017 – August 31, 2018

Condition

There were 3 out of 40 students selected out of a population of 2,143 students who received a Pell Grant or Direct Loan Funds and had a status change in the 17-18 award year. The students' status change was not reported timely (within 60 days) via a roster file update to the NSLDS. These selections were 151, 333 and 152 days late, respectively, at the time they were identified.

Status changes for two of the selected students occurred late in the quarter and were retroactively processed after the last scheduled enrollment extract date for that quarter. For this reason, the status changes for both students were not reported to the NSC timely, and therefore, NSC did not report these changes to NSLDS. Per the NSC Enrollment Extract Schedule for the 2017-2018 academic year, the last day of each quarter that enrollment extract files are sent to NSC is the first business day after the last day of classes for that quarter. For retroactive changes that occur after the last enrollment extract file date for the term, the current protocol is that Registrar staff must notify the Academic Services Analyst of the retroactive changes, and a manual update is performed for that student's enrollment status within Stanford's internal records.

Regarding the third exception, due to the close succession of the two status changes reported for the student, the first status change was not reported by the NSC to the NSLDS. Instead, the second status change was reported by NSC to NSLDS. This occurred because the initial change was rejected as part of NSC's error reporting process and rejected students are compiled into an error report that is sent back to Stanford for additional follow-up. This report is then reviewed manually, and as such, this student was missed during the resolution process, and never corrected within NSC, and therefore was not communicated to the NSLDS.

The effective administration of Title IV programs could be impacted when changes in students' status are not reported timely and accurately. The accuracy of enrollment information is important as a student's enrollment status determines eligibility for in-school status, deferment, grace periods, and repayments, as well as the Government's payment of interest subsidies.

Recommendation

PwC recommended that Stanford increase the frequency of enrollment extract reporting to the National Student Clearinghouse (NSC), specifically around the end of each quarter to ensure that any retroactive status changes are correctly reported before the beginning of the following term. PwC also noted that while Stanford correctly followed operating procedures regarding the third exception by reporting the student's status change timely to the NSC, it is the responsibility of the University to ensure that those changes are correctly reflected within the NSC and ultimately within NSLDS. PwC recommended that Stanford monitor and follow up with the NSC to obtain this update when available. PwC further recommended that Stanford perform a series of audits of student enrollment reporting for students whose status changes retroactively or in quick succession (e.g. two status changes within 3 months) to ensure that the NSC is accurately reporting all status changes to the NSLDS.

Status Update

Stanford has established a second level of review in the Registrar's Office to ensure enrollment status changes are properly reported. The new process changes, as follows, were implemented by the end of summer quarter, August 31, 2019 by the Assistant Registrar for Records and Enrollment, Registrar's Office:

a) Modify timing of enrollment extract reporting: As a baseline, the NSC suggests that schools send enrollment extracts every 30-45 days. Since Stanford exceeds these requirements, our action plan was to change the timing of all End of Quarter (EQ) enrollment files. The timing of EQ files was changed from the business day after the last day of classes to 7 days after the last day of classes which began during the Summer Quarter 2018-2019 which started June 24 and ended August 16, 2019. The change ensures late enrollment status changes, such as full-time to half-time, are thoroughly captured/reported well beyond the end of each term.

b) Implementation of Tableau Reporting Software: Beginning Spring Quarter 2018-2019, Stanford has begun to leverage the capabilities of Tableau Software. A new enrollment reporting Tableau Dashboard was already in use in the Summer Quarter and helps Stanford better identify any retroactive enrollment status changes, such as late leaves. For example, if a retroactive leave is entered into the system by staff, Tableau will send 'real-time' automated email notifications to the Registrar's Office, including Financial Aid Office and Vaden. Upon receiving an email notification, staff will promptly review the student record, and send any retroactive enrollment status changes to the NSC. This new automated process replaces the existing protocol, which was for staff to manually remember to email the Registrar's Office after entering a retroactive leave in the system.

c) Audit NSC to NSLDS Timely Transactions: Stanford has started to perform this audit during the Summer Quarter 2018-2019. The audit is being done on a monthly basis by sampling student enrollment records to ensure that the NSC is accurately reporting status changes to the NSLDS. Specifically, Stanford periodically looks-up sample students in the NSC's, NSLDS SSCR History tab and ensure their NSC enrollment.

Finding 2018-002 - Untimely review of drawdown reconciliations

Cluster/Grantor: Research and Development/All Research and Development awards
Award Name: All Research and Development awards
Award Year: Multiple
Award Number: All Research and Development awards
CFDA Numbers: All Research and Development awards

Condition

Stanford has a policy whereby the Sponsored Receivables Manager ("SRM") and SRM Associate Director are required to sign-off on all monthly General Ledger to cash drawdown reconciliations on a monthly basis within 30 days of the reconciliation being prepared.

PwC noted that two (2) monthly drawdown reconciliations (months of January 2018 and May 2018) were not reviewed by the SRM Associate Director until April 2019. This reconciliation was also not reviewed timely for all other months within FY18. Lack of timely review of the General Ledger with actual cash drawdown reports exposes Stanford to the risk that cash drawn downs from the Federal government do not agree with the expenditures incurred over Federal awards.

Recommendation

PwC recommended that Stanford implement additional training to effectively transition ownership of controls and processes in the event of personnel changes within the Sponsored Receivables Management department. Doing so will reduce the risk that controls are not effectively performed throughout the year.

Status Update

SRM department has assigned the responsibility to perform monthly cash drawdown reconciliations to a Research Accountant, that are reviewed by the SRM Director. The reconciliations have been performed timely since February 2019. All reconciliations for the period prior to February 2019 have been completed and no material variances were identified.

Finding 2018-003 - Misclassification of cost share awards and inaccurate reporting of cost share information on Federal Financial Reports

#	Finding subpart	Cluster/ Grantor	CFDA #	CFDA Title	Award Period	Award Number	Dollar Impact (if applicable)
1	(a)	R&D Cluster, Department of Health and Human Services (DHHS)	93.855	Allergy, Immunology and Transplantation Research	6/26/2017 – 5/31/2018	RAI133370A	N/A
2	(a)	R&D Cluster, Department of Defense (DOD)	12.300	Basic and Applied Scientific Research	4/1/2015 – 3/31/2018	N00014-15-1-2172	N/A
3	(b)	R&D Cluster, Department of Energy (DOE)	81.135	Advance Research Projects Agency – Energy	4/30/2015 – 9/30/2017	DE-AR0000533	$1,428.78
4	(b)	R&D Cluster, Department of Defense (DOD)	12.800	Air Force Defense Research Sciences Program	9/30/2015 – 9/29/2017	FA9550-15-1-0411	N/A
5	(b)	R&D Cluster, Department of Energy (DOE)	81.135	Advance Research Projects Agency – Energy	2/11/2014 – 9/30/2017	DE-AR0000393	N/A

Condition

Stanford has controls and processes in place which cover the setup of cost sharing awards, the calculation of appropriate cost matching requirements and controls over the final reporting of cost sharing. These controls, considered together, work to ensure that the cost sharing requirements are 1) tracked, 2) correctly calculated, and 3) accurately reported.

Inadequate codification of cost sharing requirements as non-Federal vs. Federal

For each award in which cost sharing has been committed, Stanford sets up an internal award code solely for charging cost sharing expenditures. Per review of the cost sharing data extract (i.e., detailed listing) provided by management, PwC identified two cost sharing awards related to Federal awards which were set up as non-Federal cost share. PwC also identified an award on the listing that as set up as Federal cost share, when in fact the related award was non-Federal. As a result, these awards were improperly excluded and improperly included, respectively, in the audit testing population. However, PwC found that Federal vs non-Federal awards were being classified correctly at the department level. Therefore, whilst there is a control deficiency at the consolidated monitoring level, each department is correctly accounting for and classifying Federal and non-Federal awards.

The inability to completely and accurately classify cost sharing requirements, could impact the monitoring of cost sharing requirements and as such subject Stanford to the risk that cost sharing requirements may not be fully met or identified in accordance with the terms and conditions of the Federal award.

Inaccurate reporting of cost share expenditures on Federal Financial Reports

For each award with cost sharing requirements, the Federal Financial Report (FFR) submitted to the corresponding awarding agency upon closeout must include the award recipient's share of expenditures (i.e., cost share expenditures). For three awards with cost sharing requirements, PwC noted that the recipient's share of expenditures as reported on the FFR differed from the amount actually expended per supporting documentation.

In two of these cases Stanford met the minimum cost sharing requirement but erroneously reported a cost sharing amount of $9,839 higher than the amount of cost share actually incurred – this was determined to be human error and was not caught in the Office of Research Administration's (ORA) review control procedures. This reported amount was in excess of the minimum cost sharing requirement and therefore there is no compliance impact.

In the third case, Stanford found that its actual share of expenditures for award DE-AR0000533 did not meet the 5% requirement as stipulated by the award agreement. As such, in May 2019, Stanford submitted a revised FFR to the awarding agency and took steps to repay the Federal Government $1,428.78 in order to meet the cost sharing requirement noted above.

The inaccurate reporting of cost share expenditures on FFRs subjects Stanford to the risk that cost sharing responsibilities are not fully met, even if Stanford has processes in place to identify Federal awards with cost sharing requirements, and therefore could result in potential non-compliance with Federal minimum cost sharing requirements.

Recommendation

Inadequate codification of cost sharing requirements as non-Federal vs. Federal

PwC recommended that Stanford 1) communicate to ORA Accountants the importance of correctly coding cost sharing requirements across all awards, and 2) ensure that ORA Accountants will appropriately and consistently code cost sharing requirements during the award set-up process.

Inaccurate reporting of cost share expenditures on Federal Financial Reports

PwC recommended that Stanford implement processes to ensure that ORA performs adequate review over cost share expenditures and obtains sufficient comfort over support provided by the departments before submitting FFRs to the awarding agencies.

Status Update

For the award that was reported below cost-share requirement, a revised FFR was submitted to the awarding agency and a payment of $1,428.78 was issued to the Federal Government in May 2019. The following enhanced procedures have been implemented by the Sr. Director, Post Award Operations, ORA:

a. The importance of appropriate coding of Cost Share awards to Mandatory or Voluntary categories in Oracle was communicated to the Post Award Research Accountants through the ORA Post Award All Hands meeting on May 14, 2019 by the Sr. Director of Post Award Operations. Details of the audit finding and the importance of appropriate coding of cost share awards were communicated and stressed upon.

b. During the life of the award, the ORA Post Award team will routinely check-in with the departments that the cost share supporting documentation supports the amounts reported in their monthly invoices. This is an ongoing activity and its importance was discussed with the Post Award team members at the ORA Post Award All Hands meeting on May 14, 2019.

c. At award closeout, the ORA Post Award Research Accountants will verify supporting documentation from the departments for cost share amounts reported. This is an ongoing activity and its importance was discussed with the Post Award team members at the ORA Post Award All Hands meeting on May 14, 2019.

Also, the University's Cost Sharing monitoring policy has been updated as authorized by the Office of the Vice Provost and the Dean of Research and published on the "DoResearch" website used by the research community.