# Harvard University

**Report on Federal Awards in Accordance with the Uniform Guidance**
**June 30, 2020**
**EIN #04-2103580**

# Harvard University
## Report on Federal Awards in Accordance with the Uniform Guidance
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## June 30, 2020

# Part I

## Financial Statements and Schedule of Expenditures of Federal Awards

## Report of Independent Auditors

To the Joint Committee on Inspection of the Governing Boards of Harvard University:

### Report on the Consolidated Financial Statements

We have audited the accompanying consolidated financial statements of Harvard University and its subsidiaries (the "University"), which comprise the consolidated balance sheet as of June 30, 2020, and the related consolidated statements of changes in net assets with general operating account detail, changes in net assets of the endowment and of cash flows for the year 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 audit. We conducted our audit 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 the University'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 the University'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 Harvard University and its subsidiaries as of June 30, 2020, and the changes in their net assets and their cash flows for the year then ended in accordance with accounting principles generally accepted in the United States of America.

***Emphasis of Matter***

As discussed in Note 2 to the consolidated financial statements, the University changed the manner in which it accounts for restricted cash and certain other cash balances within the statements of cash flows and the manner in which it accounts for leases in 2020. Our opinion is not modified with respect to this matter.

***Other Matters***

We previously audited the consolidated balance sheet as of June 30, 2019, and the related consolidated statements of changes in net assets with general operating account detail, changes in net assets of the endowment and of cash flows for the year then ended (not presented herein), and in our report dated October 24, 2019, we expressed an unmodified opinion on those consolidated financial statements. In our opinion, the information set forth in the accompanying summarized financial information as of June 30, 2019 and for the year then ended is consistent, in all material respects, with the audited consolidated financial statements from which it has been derived.

***Other Information***

Our audit was conducted for the purpose of forming an opinion on the consolidated financial statements as a whole. The accompanying schedule of expenditures of federal awards for the year ended June 30, 2020 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 taken as a whole.

**Other Reporting Required by *Government Auditing Standards***

In accordance with *Government Auditing Standards*, we have also issued our report dated October 22, 2020 on our consideration of the University'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. The purpose of that report is solely 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 the effectiveness of 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 the University's internal control over financial reporting and compliance.

PricewaterhouseCoopers LLP

Boston, Massachusetts
October 22, 2020

## BALANCE SHEETS

*with summarized financial information as of June 30, 2019*

| *In thousands of dollars* | June 30 2020 | 2019 |
|---|---|---|
| **ASSETS:** | | |
| Cash and cash equivalents | **$ 176,615** | $ 158,640 |
| Receivables, net *(Note 4)* | **262,731** | 296,321 |
| Prepayments and deferred charges | **304,920** | 266,719 |
| Operating leases – right of use assets *(Note 18)* | **754,699** | 0 |
| Notes receivable, net *(Note 5)* | **372,234** | 373,623 |
| Pledges receivable, net *(Note 6)* | **2,403,175** | 2,765,827 |
| Fixed assets, net *(Note 7)* | **8,435,255** | 8,271,711 |
| Interests in trusts held by others *(Note 3)* | **427,359** | 420,371 |
| Securities pledged to counterparties, at fair value *(Note 3)* | **214,010** | 49,971 |
| Investment portfolio, at fair value *(Note 3)* | **48,111,441** | 46,723,970 |
| **TOTAL ASSETS** | **$ 61,462,439** | **$ 59,327,153** |
| **LIABILITIES:** | | |
| Accounts payable | **$ 321,666** | $ 398,134 |
| Deferred revenue and other liabilities | **1,580,178** | 1,517,022 |
| Operating lease liabilities *(Note 18)* | **767,599** | 0 |
| Other liabilities associated with the investment portfolio *(Notes 3 and 10)* | **878,018** | 875,141 |
| Liabilities due under split interest agreements *(Note 9)* | **819,584** | 859,744 |
| Bonds and notes payable *(Note 10)* | **5,664,679** | 5,213,349 |
| Accrued retirement obligations *(Note 11)* | **1,216,251** | 1,120,544 |
| Government loan advances *(Note 5)* | **44,748** | 66,733 |
| **TOTAL LIABILITIES** | **11,292,723** | **10,050,667** |
| **NET ASSETS** | **50,169,716** | **49,276,486** |
| **TOTAL LIABILITIES AND NET ASSETS** | **$ 61,462,439** | **$ 59,327,153** |

| | Without donor restrictions | With donor restrictions | June 30 2020 | 2019 |
|---|---|---|---|---|
| NET ASSETS: | | | | |
| General Operating Account (GOA) *(Note 8)* | $ 4,922,307 | $ 2,754,836 | $ 7,677,143 | $ 7,773,417 |
| Endowment *(Note 8)* | 7,374,810 | 34,519,570 | 41,894,380 | 40,929,700 |
| Split interest agreements *(Note 9)* | | 598,193 | 598,193 | 573,369 |
| **TOTAL NET ASSETS** | **$ 12,297,117** | **$ 37,872,599** | **$ 50,169,716** | **$ 49,276,486** |

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

## STATEMENTS OF CHANGES IN NET ASSETS WITH GENERAL OPERATING ACCOUNT DETAIL

*with summarized financial information for the year ended June 30, 2019*

| *In thousands of dollars* | Without Donor Restrictions | With Donor Restrictions | For the year ended June 30 2020 | 2019 |
|---|---|---|---|---|
| **OPERATING REVENUE:** | | | | |
| Net student income *(Notes 2 and 12)* | $ 1,070,156 | | **$ 1,070,156** | $ 1,200,838 |
| Sponsored support *(Note 13)* | | | | |
| Federal government – direct costs | 436,552 | | **436,552** | 448,832 |
| Federal government – indirect costs | 179,678 | | **179,678** | 181,948 |
| Non-federal sponsors – direct costs | 76,385 | $ 184,354 | **260,739** | 267,257 |
| Non-federal sponsors – indirect costs | 22,279 | 18,273 | **40,552** | 39,353 |
| Total sponsored support | 714,894 | 202,627 | **917,521** | **937,390** |
| Gifts for current use *(Note 14)* | 103,659 | 373,905 | **477,564** | 472,113 |
| Investment income: | | | | |
| Endowment returns made available for operations *(Note 8)* | 364,763 | 1,633,993 | **1,998,756** | 1,908,423 |
| GOA returns made available for operations | 176,174 | | **176,174** | 180,634 |
| Other investment income | 28,596 | 4,709 | **33,305** | 39,134 |
| Total investment income | 569,533 | 1,638,702 | **2,208,235** | **2,128,191** |
| Other revenue *(Note 15)* | 699,354 | | **699,354** | 772,038 |
| Net assets released from restriction | 2,092,571 | (2,092,571) | **0** | 0 |
| **TOTAL OPERATING REVENUE** | **5,250,167** | **122,663** | **5,372,830** | **5,510,570** |
| **OPERATING EXPENSES:** | | | | |
| Salaries and wages | 2,131,511 | | **2,131,511** | 2,038,478 |
| Employee benefits *(Note 11)* | 620,752 | | **620,752** | 555,793 |
| Services purchased | 670,485 | | **670,485** | 680,691 |
| Space and occupancy | 364,163 | | **364,163** | 379,290 |
| Depreciation *(Note 7)* | 376,855 | | **376,855** | 382,775 |
| Supplies and equipment | 243,870 | | **243,870** | 270,623 |
| Interest *(Note 10)* | 180,727 | | **180,727** | 181,633 |
| Scholarships and other student awards *(Note 12)* | 163,618 | | **163,618** | 155,874 |
| Other expenses *(Note 16)* | 630,897 | | **630,897** | 557,801 |
| **TOTAL OPERATING EXPENSES** | **5,382,878** | **0** | **5,382,878** | **5,202,958** |
| **NET OPERATING (DEFICIT)/SURPLUS** | **(132,711)** | **122,663** | **(10,048)** | **307,612** |
| **NON-OPERATING ACTIVITIES:** | | | | |
| Income from GOA Investments | 8,808 | | **8,808** | 5,112 |
| GOA realized and change in unrealized appreciation, net *(Note 3)* | 281,613 | | **281,613** | 261,944 |
| GOA returns made available for operations | (176,174) | | **(176,174)** | (180,634) |
| Change in pledge balances *(Note 6)* | | (171,440) | **(171,440)** | 352,553 |
| Change in interests in trusts held by others | | 657 | **657** | 1,656 |
| Gifts for facilities and loan funds *(Note 14)* | | 51,448 | **51,448** | 86,372 |
| Change in retirement obligations *(Note 11)* | (81,927) | | **(81,927)** | (136,456) |
| Other changes | (12,670) | | **(12,670)** | (17,505) |
| Transfers between GOA and endowment *(Note 8)* | (3,052) | 4,595 | **1,543** | (92,420) |
| Transfers between GOA and split interest agreements *(Note 9)* | | 11,916 | **11,916** | 13,886 |
| Non-operating net assets released from restrictions | 148,302 | (148,302) | **0** | 0 |
| **TOTAL NON-OPERATING ACTIVITIES** | **164,900** | **(251,126)** | **(86,226)** | **294,508** |
| **GENERAL OPERATING ACCOUNT NET CHANGE DURING THE YEAR** | **32,189** | **(128,463)** | **(96,274)** | **602,120** |
| Endowment net change during the year | 283,226 | 681,454 | **964,680** | 1,695,964 |
| Split interest agreements net change during the year *(Note 9)* | | 24,824 | **24,824** | 14,218 |
| **NET CHANGE DURING THE YEAR** | **315,415** | **577,815** | **893,230** | **2,312,302** |
| Net assets, beginning of year | 11,981,702 | 37,294,784 | **49,276,486** | **46,964,184** |
| **NET ASSETS, END OF YEAR** | **$ 12,297,117** | **$ 37,872,599** | **$ 50,169,716** | **$ 49,276,486** |

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

## STATEMENTS OF CHANGES IN NET ASSETS OF THE ENDOWMENT

*with summarized financial information for the year ended June 30, 2019*

| *In thousands of dollars* | Without Donor Restrictions | With Donor Restrictions | For the year ended June 30 2020 | 2019 |
|---|---|---|---|---|
| Investment return *(Note 3):* | | | | |
| Income from general investments | $ 13,549 | $ 60,756 | **$ 74,305** | $ 37,189 |
| Realized and change in unrealized appreciation, net | 477,536 | 2,124,590 | **2,602,126** | 2,289,499 |
| Total investment return | 491,085 | 2,185,346 | **2,676,431** | **2,326,688** |
| Endowment returns made available for operations | (364,763) | (1,633,993) | **(1,998,756)** | (1,908,423) |
| Net investment return | 126,322 | 551,353 | **677,675** | **418,265** |
| Gifts for endowment *(Note 14)* | 78,342 | 390,861 | **469,203** | 613,287 |
| Transfers between endowment and the GOA *(Note 8)* | 3,052 | (4,595) | **(1,543)** | 92,420 |
| Capitalization of split interest agreements *(Note 9)* | | 12,136 | **12,136** | 15,213 |
| Change in pledge balances *(Note 6)* | | (191,451) | **(191,451)** | 575,155 |
| Change in interests in trusts held by others *(Note 8)* | | 6,331 | **6,331** | 9,747 |
| Other changes | (203) | (7,468) | **(7,671)** | (28,123) |
| Net assets released from restrictions | 75,713 | (75,713) | **0** | 0 |
| **NET CHANGE DURING THE YEAR** | **283,226** | **681,454** | **964,680** | **1,695,964** |
| Net assets of the endowment, beginning of year | 7,091,584 | 33,838,116 | **40,929,700** | 39,233,736 |
| **NET ASSETS OF THE ENDOWMENT, END OF YEAR** | **$ 7,374,810** | **$ 34,519,570** | **$ 41,894,380** | **$ 40,929,700** |

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

## STATEMENTS OF CASH FLOWS

*with summarized financial information for the year ended June 30, 2019*

| *In thousands of dollars* | For the year ended June 30 2020 | 2019 |
|---|---|---|
| **CASH FLOWS FROM OPERATING ACTIVITIES:** | | |
| Change in net assets | **$ 893,230** | $ 2,312,302 |
| Adjustments to reconcile change in net assets to net cash (used in) operating activities: | | |
| Depreciation | **376,855** | 382,775 |
| Amortization of premium and discount related to bonds and notes payable | **(28,489)** | (27,272) |
| Realized and change in unrealized appreciation, net | **(2,940,852)** | (2,611,556) |
| Change in fair value of interest rate exchange agreements | **16,832** | 11,928 |
| Change in interests in trusts held by others | **(6,988)** | (11,403) |
| Change in liabilities due under split interest agreements | **(14,147)** | 30,786 |
| Gifts of donated securities | **(114,118)** | (92,158) |
| Proceeds from the sales of gifts of unrestricted securities | **18,886** | 14,198 |
| Gifts for restricted purposes | **(335,376)** | (518,827) |
| Cost of issuance of debt | **(4,213)** | |
| Loss on disposal of assets | **181,349** | 41,239 |
| Change in accrued retirement obligations | **95,707** | 136,992 |
| Non-cash operating lease costs | **25,759** | |
| Changes in operating assets and liabilities: | | |
| Receivables, net | **33,590** | 4,937 |
| Prepayments and deferred charges | **(38,201)** | (135,794) |
| Pledges receivable, net | **362,652** | (928,035) |
| Accounts payable | **(37,995)** | 77,182 |
| Deferred revenue and other liabilities | **77,367** | 189,568 |
| Operating lease liability | **(27,070)** | |
| **NET CASH (USED IN) OPERATING ACTIVITIES** | **(1,465,222)** | **(1,123,138)** |
| **CASH FLOWS FROM INVESTING ACTIVITIES:** | | |
| Loans made to students, faculty, and staff | **(49,990)** | (41,938) |
| Payments received on student, faculty, and staff loans | **52,515** | 49,720 |
| Change in other notes receivable | **(1,136)** | 390 |
| Proceeds from the sales and maturities of investments | **14,837,933** | 15,186,174 |
| Purchase of investments | **(13,911,250)** | (14,002,833) |
| Change associated with repurchase agreements | **296,726** | 374,719 |
| Additions to fixed assets | **(764,415)** | (994,830) |
| **NET CASH PROVIDED BY INVESTING ACTIVITIES** | **460,383** | **571,402** |
| **CASH FLOWS FROM FINANCING ACTIVITIES:** | | |
| Change in overdrafts included in accounts payable | **4,194** | (7,618) |
| Change in split interest liability from new contributions, income and payments to annuitants | **(26,013)** | (33,455) |
| Proceeds from issuance of debt | **602,131** | 480,900 |
| Debt repayments | **(118,099)** | (541,200) |
| Proceeds from the sales of gifts of restricted securities | **95,232** | 77,960 |
| Gifts for restricted purposes | **335,376** | 518,827 |
| Affiliated entity contributions and distributions, net | **56** | 397 |
| Change in government loan advances | **(21,985)** | 1,324 |
| **NET CASH PROVIDED BY FINANCING ACTIVITIES** | **870,892** | **497,135** |
| **NET CHANGE IN CASH** | **(133,947)** | **(54,601)** |
| Cash, beginning of year | **1,494,545** | **1,549,146** |
| **CASH, END OF YEAR** | **$ 1,360,598** | **$ 1,494,545** |
| Cash and cash equivalents (per *Balance Sheets*) | **$ 176,615** | $ 158,640 |
| Cash and cash equivalents held in investments *(Note 3)* | **1,183,983** | 1,335,905 |
| **TOTAL CASH AND CASH EQUIVALENTS** | **$ 1,360,598** | **$ 1,494,545** |
| Supplemental disclosure of cash flow information: | | |
| Accounts payable related to fixed asset additions | $ 35,237 | $ 77,904 |
| Cash paid for interest | $ 212,831 | $ 216,110 |
| Non-cash proceeds from issuance of debt | $ 450,000 | |
| Use of non-cash proceeds to refinance debt | $ (450,000) | |

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

## 1. UNIVERSITY ORGANIZATION

Harvard University (the "University") is a private, not-for-profit institution of higher education with approximately 6,700 undergraduate and 13,600 graduate students in fiscal year 2020. Established in 1636, the University includes the Faculty of Arts and Sciences, the John A. Paulson School of Engineering and Applied Sciences, the Division of Continuing Education, ten graduate and professional Schools, the Radcliffe Institute for Advanced Study, a variety of research museums and institutes, and an extensive library system to support the teaching and research activities of the Harvard community. The President and Fellows of Harvard College (the "Corporation"), a governing board of the University, has oversight responsibility for all of the University's financial affairs. The Corporation delegates substantial authority to the Schools and departments for the management of their resources and operations.

The University includes Harvard Management Company (HMC), a wholly owned subsidiary founded in 1974 to manage the University's investment assets. HMC is governed by a Board of Directors that is appointed by the Corporation.

## 2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

### Basis of presentation

The accompanying consolidated financial statements have been prepared on the accrual basis of accounting and include the accounts of the University and affiliated organizations controlled by the University. Significant inter-affiliate accounts and transactions have been eliminated.

Funds transferred to the University on behalf of specific beneficiaries (agency funds) are recorded as assets and liabilities in the *Balance Sheets* and are not included in the *Statement of Changes in Net Assets with General Operating Account Detail*.

The financial statements include certain prior year summarized comparative information in total, not by net asset classification. This information is not presented in sufficient detail to conform to generally accepted accounting principles (GAAP). Accordingly, such information should be read in conjunction with the University's financial statements for the year ended June 30, 2019, from which the summarized information is derived. Certain prior year amounts have been reclassified to conform to current year presentation.

### Net asset classifications

For the purposes of financial reporting, the University classifies resources into two net asset categories pursuant to any donor-imposed restrictions and applicable law. Accordingly, the net assets of the University are classified in the accompanying financial statements in the categories that follow:

**WITHOUT DONOR RESTRICTIONS** — Net assets not subject to donor-imposed restrictions. Funds invested in fixed assets and unrestricted endowment funds comprise 93% of the University's net assets without donor-imposed restrictions as of June 30, 2020. In addition, this category includes gifts and endowment income balances where the donor restriction has been met, University-designated loan funds, and other current funds.

**WITH DONOR RESTRICTIONS** — Net assets subject to legal or donor-imposed restrictions that will be satisfied either by actions of the University, the passage of time, or both. These net assets include net assets subject to donor-imposed restrictions that are invested to provide a perpetual source of income to the University. Generally, donors of these assets require the University to maintain and invest the original contribution in perpetuity, but permit the use of some or all investment returns for general or specific purposes. The appreciation on these perpetual contributions must be reported as net assets with donor restrictions until appropriated for spending in accordance with Massachusetts law. Also included in this category are gifts donated for a particular purpose and amounts subject to time restrictions such as funds pledged for future payment.

Revenues from sources other than contributions are generally reported as increases in net assets without donor restrictions. Expenses are reported as decreases in net assets without donor restrictions. Gains and losses on investments are reported as increases or decreases in net assets without donor restrictions, unless their use is restricted by donor stipulations or by law. Investment returns earned by restricted donor funds are initially classified as net assets with donor restrictions and then reclassified to net assets without donor restrictions when expenses are appropriated or incurred for their intended purpose. Expirations of donor restrictions on net assets are reported as reclassifications from net assets with donor restrictions to net assets without donor restrictions and appear as "Net assets released from restrictions" and "Non-operating net assets released from restrictions" in the *Statements of Changes in Net Assets*.

## Cash and cash equivalents

Effective July 1, 2019, the University adopted ASU 2016-18, *Restricted Cash (Topic 230): Statement of Cash Flows* which requires all cash and cash equivalents, including cash amounts held in the endowment, to be included in cash and cash equivalents presented in the *Statements of Cash Flows*. As a result of adopting this standard, certain amounts previously reported as of June 30, 2019 were adjusted to conform to the presentation requirements as follows:

| | As previously presented | Cash and cash equivalents held in investments | New amount after adoption of ASU |
|---|---|---|---|
| Cash, beginning of the year | $ 144,982 | $ 1,404,164 | $ 1,549,146 |
| Cash, end of the year | 158,640 | 1,335,905 | 1,494,545 |
| Proceeds from the sales and maturities of investments | 15,001,898 | 184,276 | 15,186,174 |
| Purchase of investments | (13,750,298) | (252,535) | (14,002,833) |

## Liquidity and availability

As part of the University's liquidity management, it has a policy to structure its financial assets to be available as its general expenditures, liabilities and other obligations come due. A significant portion of the University's annual expenditures are funded by operating revenues in the current year including student income, sponsored support, endowment returns made available for operations, gifts for current use and other revenues.

The University's financial assets available within one year of the balance sheet date for general expenditure, such as operating expenses, scheduled principal payments on debt, and capital construction costs not financed with debt, are as follows (in thousands):

| | June 30, 2020 | June 30, 2019 |
|---|---|---|
| **FINANCIAL ASSETS** | | |
| Cash and cash equivalents | $ 176,615 | $ 158,640 |
| Receivables, net | 262,731 | 296,321 |
| Pledge receivables due in one year | 190,190 | 221,587 |
| Cash, cash equivalents, and short-term investments held separately by General Operating Account (GOA) | 1,559,440 | 1,013,861 |
| Endowment and GOA returns made available for operations in the following year[1] | 2,184,082 | 2,175,806 |
| **TOTAL FINANCIAL ASSETS AVAILABLE WITHIN ONE YEAR** | **$ 4,373,058** | **$ 3,866,215** |
| **LIQUIDITY RESOURCES** | | |
| Credit facility, undrawn balance | 1,500,000 | 1,500,000 |
| Tax-exempt commercial paper, undrawn balance | 1,000,000 | 650,000 |
| Taxable commercial paper, undrawn balance | 2,000,000 | 2,000,000 |
| **TOTAL FINANCIAL ASSETS AND RESOURCES AVAILABLE WITHIN ONE YEAR** | **$ 8,873,058** | **$ 8,016,215** |

[1] *Within its investment pools, the University holds cash, cash equivalents, repurchase agreements, and unencumbered US government securities that could be liquidated to fund this amount* (Note 3).

Endowment and GOA returns liquidated from investments and made available for operations over the course of the fiscal year are distributed to University department and program budgets to spend, subject to donor restrictions where applicable.

While the University has no intention of doing so, there are additional investments held by the University and the endowment that could be liquidated in the event of an unexpected disruption. While a portion of the endowment is subject to donor restrictions, there is $7.4 billion and $7.1 billion in endowment funds without donor restrictions at June 30, 2020 and 2019, respectively and $3.5 billion and $3.7 billion of General Operating Account investments (GOA) at June 30, 2020 and 2019, respectively, that could be accessed with the approval of the Corporation and subject to the redemption provisions described in *Note 3*.

## Revenue recognition

Revenue is recognized when control of promised goods or services is transferred to customers, in an amount that reflects the consideration the University expects to be entitled to in exchange for those goods or services.

Student income is derived from degree programs as well as executive and continuing education programs and includes tuition, fees, and board and lodging. Student income is recognized ratably over the academic period of the course or program offered based on time elapsed, and scholarships awarded to students reduce the amount of revenue recognized. The University's individual schools

have various billing and academic cycles and the majority of our programs are completed within the fiscal year. Student income received in advance of services to be rendered is recorded as deferred revenue which totaled $208.3 million and $213.7 million, respectively, for the periods ended June 30, 2020 and 2019, which are primarily recognized in the subsequent fiscal year.

Total student income of $1.1 billion and $1.2 billion was recorded during the years ended June 30, 2020 and 2019, respectively. Student tuition, fees, board and lodging at published rates is summarized as follows for the years ended June 30, 2020 and 2019 (in thousands of dollars):

| | 2020 | 2019 |
|---|---|---|
| Undergraduate program | **$ 347,292** | $ 339,475 |
| Graduate and professional degree programs | **613,614** | 605,833 |
| Continuing education and executive programs | **425,867** | 516,077 |
| Board and lodging | **164,372** | 196,822 |

*Scholarships applied to student charges were $480,989 and $457,369 for the years ended June 20, 2020 and 2019, respectively.*

Unconditional contributions including pledges are recognized immediately and classified as either net assets with donor restrictions or net assets without donor restrictions. Conditional contributions for which cash is received are accounted for as a liability within deferred revenue.

Sponsored support of $917.5 million includes support from governmental and private sources. Certain sponsored arrangements are considered exchange arrangements, and revenue under these agreements is recognized based on the University's fulfillment of the contract, which is typically based on costs incurred or the achievement of milestones. Other sponsored support is considered contribution revenue, which is recognized when any donor-imposed conditions have been met, if applicable. Sponsored conditional contributions received, where the barrier to entitlement is not yet overcome are recorded as deferred revenues of $51.2 million as of June 30, 2020 and 2019. As of June 30, 2020, the University also had $1.4 billion awarded but not yet expended contributions related to sponsored programs where the condition had not yet been met. This is subject to federal appropriations. Funding received in advance of recognition is recorded as deferred revenue.

Other revenue of $699.4 million includes several revenue streams considered exchange contracts with customers totaling $579.7 million for fiscal year 2020. These revenues are recognized at the point in time goods or services are provided. Deferred revenues related to other income of $107.6 million and $109.0 million were recorded as of June 30, 2020 and 2019, which are primarily recognized in the subsequent fiscal year.

### Measure of operations

Revenues earned, expenses incurred, and returns made available for operations for the purpose of teaching, conducting research, and the other programs and services of the University are the components of "Net operating surplus" in the *Statement of Changes in Net Assets with General Operating Account Detail*. The University's non-operating activity within the *Statement of Changes in Net Assets with General Operating Account Detail* includes contributions to the University's building construction and renovation funds, investment returns (net of amounts made available for operations), change in pledge balances, long-term benefit plan obligation funding changes, and other infrequent transactions.

### Collections

The University's vast array of museums and libraries contains priceless works of art, historical treasures, literary works, and artifacts. These collections are protected and preserved for public exhibition, education, research, and the furtherance of public service. They are neither disposed of for financial gain nor encumbered in any manner. Accordingly, such collections are not recorded for financial statement purposes.

### Insurance programs

The University, together with the Harvard-affiliated teaching hospitals, has formed a captive insurance company, Controlled Risk Insurance Company (CRICO), to provide limited professional liability, general liability, and medical malpractice insurance for its shareholders. The University self-insures a portion of its professional liability and general liability programs and maintains a reserve for incurred claims, including those related to Harvard Medical School activities not occurring in the affiliated teaching hospitals. CRICO provided malpractice coverage applies with no deductible for medical professionals practicing within Harvard's University Health Services department, the School of Dental Medicine, and the T.H. Chan School of Public Health. The University also maintains reserves for the self-insured portion of claims related to automobile liability, property damage, and workers' compensation; these programs are supplemented with commercial excess insurance above the University's self-insured limit. In addition, the University is self-insured for unemployment, the primary retiree health plan, and all health and dental plans for active employees. The University's claims liabilities are recognized as incurred, including claims that have been incurred but not reported, and are included in operating expenses.

## Tax

The University is a tax-exempt organization under Section 501(c)(3) of the Internal Revenue Code.

On December 22, 2017, the Tax Cuts and Jobs Act (the "Act") was enacted. The Act impacts the University in several ways, including the addition of excise taxes on executive compensation and net investment income, as well as new rules for calculating unrelated business taxable income. The University records an estimate for related tax expense based on currently available regulatory guidance of the Act, and continues to evaluate the impact of the Act on current and future tax positions.

## Use of estimates

The preparation of financial statements in accordance with U.S. GAAP requires management to make estimates and assumptions that affect reported amounts and disclosures. Actual results could differ from those estimates.

## New accounting pronouncements

Effective July 1, 2019, the University adopted ASU 2017-07, *Compensation — Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost*. The amendment requires the bifurcation of net benefit cost where the service cost component continues to be presented with other employee costs in operating income (or capitalized in assets) and the other components (such as interest, expected return on plan assets, and amortization of actuarially determined amounts) are required to be presented as a nonoperating change in net assets without restrictions. The new standard requires retrospective application and allows a practical expedient that permits an employer to use the amounts disclosed in its employee benefits footnote for the prior comparative periods as the estimation basis for applying the retrospective presentation. The University utilized the practical expedient to estimate the impact on the fiscal 2019 information. The adoption of the standard resulted in the reclassification of $9.7 million in net periodic benefit costs, other than service costs, from "Employee benefits" expense to "Change in retirement obligations" nonoperating expense presented in the *Statement of Changes in Net Assets with General Operating Account Detail*. Therefore, the fiscal 2019 "Net Operating Surplus" increased $9.7 million, from $297.9 million to $307.6 million.

Effective July 1, 2019, the University adopted ASU 2016-02, *Leases,* which requires a lessee to recognize a right of use asset and a lease liability, initially measured at the present value of the lease payments, in its balance sheet. The guidance also expands the required quantitative and qualitative disclosures surrounding leases. The effects of adopting this guidance resulted in the inclusion of the present value of operating lease payments in the *Balance Sheets* as "Operating leases—right of use assets" of $780.5 million and "Operating leases liabilities" of $794.7 million upon adoption. The University elected the package of practical expedients to not reassess: (1) whether any expired or existing contracts are or contain leases, (2) lease classification for any expired or existing leases and (3) initial direct costs for any expired or existing leases. The University elected the short-term lease exemption policy as well as the practical expedient that allows lessees to treat the lease and non-lease components as a single lease component. In addition, the University elected to use hindsight to reassess lease terms or impairment at the adoption date. The effects of adopting this amendment are addressed in *Note 18*.

Effective July 1, 2019, the University adopted ASU 2016-18, *Restricted Cash (Topic 230): Statement of Cash Flows*. The amendments in the update require that a statement of cash flows explain the change during the period in the total of cash, cash equivalents, and amounts generally described as restricted cash or restricted cash equivalents. Therefore, amounts generally described as restricted cash and restricted cash equivalents are now 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 effects of adopting this amendment resulted in all cash and cash equivalents, including those held in the endowment, to be included in cash and cash equivalents presented in the *Statements of Cash Flows*. The adoption of this amendment is summarized in "Cash and cash equivalents" on page 19.

Effective July 1, 2019, the University adopted ASU 2016-15, *Classification of Certain Cash Receipts and Cash Payments (Topic 230): Statement of Cash Flows*. ASU 2016-15 clarifies how certain cash receipts and cash payments in the statement of cash flows are presented. The University adopted ASU 2016-15 retrospectively. The guidance did not have a significant impact on the University's consolidated financial statements.

Effective July 1, 2019, the University adopted ASU 2016-01, *Recognition and Measurement of Financial Assets and Financial Liabilities,* which addresses certain aspects of recognition, measurement, presentation and disclosure of financial instruments. This guidance allows an entity to choose, investment-by-investment, to report an equity investment that neither has a readily determinable fair value, nor qualifies for the practical expedient for fair

value estimation using net asset value (NAV), at its cost minus impairment (if any), plus or minus changes resulting from observable price changes in orderly transactions for the identical or similar investment of the same issue. Impairment of such investments must be assessed qualitatively at each reporting period. Entities must disclose their financial assets and liabilities by measurement category and form of asset either on the face of the statement of financial position or in the accompanying notes. This guidance did not have a significant impact on the University's consolidated financial statements.

Effective July 1, 2018, the University adopted ASU 2016-14, *Presentation of Financial Statements for Not-for-Profit Entities*. This guidance is intended to improve the net asset classification requirements and the information presented in the financial statements and notes. The standard requires the University 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. In addition, underwater endowment funds were recognized as a reduction in net assets with donor restrictions and enhanced disclosures are required for board-designated amounts *(Note 8),* liquidity and availability of financial assets *(Note 2),* and expenses by both their natural and functional classification *(Note 17)*.

Effective July 1, 2018, the University adopted ASU 2014-09 *Revenue from Contracts with Customers (ASC 606)* using the modified retrospective transition method—i.e., by recognizing the cumulative effect of initially applying ASC 606 as an adjustment to the opening balance of net assets at July 1, 2018. The University elected to apply the standard only to contracts that are not completed as of that date. The guidance did not have a significant impact on the University's consolidated financial statements.

Effective July 1, 2018, the University adopted ASU 2018-08, *Clarifying the Scope and the Accounting Guidance for Contributions Received and Contributions Made,* simultaneously with adoption of the new revenue standard, using the modified prospective transition method. The guidance did not have a significant impact on the University's consolidated financial statements.

Effective July 1, 2018, the University adopted ASU 2018-13, *ASC 820 Fair Value Measurement,* which simplifies fair value measurement disclosures through the removal and modification of a number of investment related disclosure requirements. Certain disclosures are no longer required including amount of and reasons for transfers between Levels 1 and 2; policy for timing of transfers between levels and valuation processes for Level 3 investments. The guidance did not have a significant impact on the University's consolidated financial statements.

## 3. INVESTMENTS

Investments are presented at fair value in accordance with GAAP and under the guidelines prescribed by the HMC investment valuation policy, which is reviewed and approved by the HMC Board of Directors on an annual basis.

The majority of the University's investments are managed by HMC in the GIA, a pooled investment account that consists primarily of endowment assets. Certain other investments such as cash, short-term investments, split interest agreements and other assets, are managed separately from the GIA.

The University's investment holdings as of June 30, 2020 and 2019 are summarized in the following table (in thousands of dollars):

| | 2020 | 2019 |
|---|---|---|
| Investment portfolio assets | | |
| Pooled general investment account assets | **$ 45,681,215** | $ 44,875,461 |
| Other investments | **2,430,226** | 1,848,509 |
| Investment portfolio, at fair value | **48,111,441** | **46,723,970** |
| Securities pledged to counterparties, at fair value | **214,010** | 49,971 |
| **TOTAL INVESTMENT ASSETS** | **48,325,451** | **46,773,941** |
| | | |
| Pooled general investment account liabilities | **833,777** | 847,732 |
| Interest rate exchange agreement | **44,241** | 27,409 |
| **TOTAL OTHER LIABILITIES ASSOCIATED WITH THE INVESTMENT PORTFOLIO** | **878,018** | **875,141** |
| **TOTAL INVESTMENTS, NET** | **$ 47,447,433** | **$ 45,898,800** |

As of June 30, 2020 and 2019, University net investments were comprised of the following components (in thousands of dollars):

| | 2020 | 2019 |
|---|---|---|
| **POOLED GENERAL INVESTMENT ACCOUNT** | | |
| Endowment[1] | **$ 39,982,475** | $ 38,843,726 |
| General operating account | **3,486,092** | 3,716,277 |
| Split interest agreements | **803,490** | 780,737 |
| Other internally designated funds | **789,391** | 736,960 |
| **TOTAL POOLED GENERAL INVESTMENT ACCOUNT NET ASSETS** | **$ 45,061,448** | **$ 44,077,700** |
| **OTHER INVESTMENTS OUTSIDE THE GENERAL INVESTMENT ACCOUNT** | | |
| General operating and other investments[2] | **1,771,698** | 1,168,724 |
| Split interest agreements | **614,287** | 652,376 |
| **TOTAL OTHER INVESTMENTS OUTSIDE THE GENERAL INVESTMENT ACCOUNT** | **$ 2,385,985** | **$ 1,821,100** |
| **TOTAL INVESTMENTS, NET** | **$ 47,447,433** | **$ 45,898,800** |

[1] *Includes only the portion of the endowment invested in the GIA and excludes pledges, interests in trusts held by others, other non-GIA investments, and GIA interest and dividends net of all internal and external management fees and expenses.*
[2] *Consists primarily of repurchase agreements, US government securities, money markets, and fixed income funds, net of unsettled trades, totaling $1,582,042 and $1,036,080 as of June 30, 2020 and 2019, respectively.*

## Investment return

A summary of the University's total return on investments for fiscal years 2020 and 2019 is presented below (in thousands of dollars):

| | 2020 | 2019 |
|---|---|---|
| Return on pooled general investment account: | | |
| Realized and change in unrealized appreciation, net | **$ 2,931,018** | $ 2,612,986 |
| Interest, dividends, fees, and expenses, net | **83,852** | 42,631 |
| Total return on pooled general investment account[1] | **3,014,870** | **2,655,617** |
| Return on other investments: | | |
| Realized and change in unrealized appreciation/(depreciation), net | **9,834** | (1,430) |
| Interest, dividends, fees, and expenses, net | **45,685** | 52,619 |
| Total return on other investments | **$ 55,519** | **$ 51,189** |
| Realized and change in unrealized depreciation on interest rate exchange agreement, net | **(19,070)** | (13,880) |
| **TOTAL RETURN ON INVESTMENTS[2]** | **$ 3,051,319** | **$ 2,692,926** |

[1] *Net of all internal and external management fees and expenses.*
[2] *Total return on investments is comprised of returns on the endowment, GOA, Split Interest Agreements and other.*

## Fair value hierarchy

The University's investments have been categorized based upon the fair value hierarchy in accordance with ASC 820, which prioritizes the inputs to valuation techniques used to measure fair value of investment assets and liabilities into three levels:

**LEVEL 1** Unadjusted quoted prices in active markets that are accessible at the measurement date for identical, unrestricted assets or liabilities;

**LEVEL 2** Quoted prices in markets that are not considered to be active or financial instruments for which all significant inputs are observable, either directly or indirectly;

**LEVEL 3** Prices or valuations that require inputs that are significant to the fair value measurement, unobservable and/or require the University to develop its own assumptions.

Investments in externally managed funds where the University utilizes net asset values (as reported by external managers) as a practical expedient for fair value measurements are excluded from the fair value hierarchy.

The level of an asset or liability within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement. The University endeavors to utilize all relevant and available information in measuring fair value.

The following is a summary of the levels within the fair value hierarchy for those investment assets and liabilities subject to fair value measurement as of June 30, 2020 and summarized as of June 30, 2019 (in thousands of dollars):

| | 2020 | | | | | 2019 |
|---|---|---|---|---|---|---|
| | Level 1 | Level 2 | Level 3 | NAV as Practical Expedient | Total | Total |
| **ASSETS:**[1] | | | | | | |
| Cash and cash equivalents[2] | $ 1,183,983 | | | | **$ 1,183,983** | **$ 1,335,905** |
| Repurchase agreements | | $ 477,918 | | | **477,918** | **774,644** |
| Domestic equity | 1,356,614 | | | $ 2,259,044 | **3,615,658** | **3,901,454** |
| Foreign equity | 788,498 | | | 1,079,005 | **1,867,503** | **2,293,307** |
| Global equity | | | | 1,542,236 | **1,542,236** | **1,660,465** |
| Domestic fixed income | 2,099,086 | | | 613,814 | **2,712,900** | **1,813,376** |
| Foreign fixed income | 20,729 | | | | **20,729** | **25,597** |
| Emerging market equity and debt | 282,956 | | | 2,973,471 | **3,256,427** | **3,307,520** |
| High yield | 3,276 | | $ 264,452 | | **267,728** | **237,008** |
| Hedge funds | | | | 15,515,652 | **15,515,652** | **14,304,432** |
| Private equity | | | 477,858 | 10,569,260 | **11,047,118** | **9,848,429** |
| Natural resources | 21,213 | | 1,291,911 | 16,800 | **1,329,924** | **1,914,055** |
| Real estate | 15,354 | | 24,627 | 3,169,662 | **3,209,643** | **3,610,419** |
| Inflation-indexed bonds | 935,440 | | | | **935,440** | **871,832** |
| Due from brokers | | 25,664 | 4,629 | | **30,293** | **49,079** |
| Other investments | | | 6,712 | | **6,712** | **17,793** |
| **INVESTMENT ASSETS SUBJECT TO FAIR VALUE LEVELING** | **$ 6,707,149** | **$ 503,582** | **$ 2,070,189** | **$ 37,738,944** | **$ 47,019,864** | **$ 45,965,315** |
| Other investment assets not subject to fair value[3] | | | | | **1,305,587** | **808,626** |
| **TOTAL INVESTMENT ASSETS**[4] | | | | | **$ 48,325,451** | **$ 46,773,941** |
| Interests in trusts held by others[5] | | | 427,359 | | **427,359** | **420,371** |
| **NON-INVESTMENT ASSETS SUBJECT TO FAIR VALUE LEVELING** | | | **$ 427,359** | | **$ 427,359** | **$ 420,371** |
| **TOTAL ASSETS** | | | | | **$ 48,752,810** | **$ 47,194,312** |
| **LIABILITIES:** | | | | | | |
| Due to brokers[6] | $ 12,373 | $ 119,692 | | | **$ 132,065** | **$ 33,912** |
| Other liabilities subject to fair value | | | $ 246,410 | | **246,410** | **288,372** |
| **INVESTMENT LIABILITIES SUBJECT TO FAIR VALUE LEVELING** | **$ 12,373** | **$ 119,692** | **$ 246,410** | | **$ 378,475** | **$ 322,284** |
| Other investment liabilities not subject to fair value[7] | | | | | **499,543** | **552,857** |
| **TOTAL INVESTMENT LIABILITIES**[4] | | | | | **$ 878,018** | **$ 875,141** |
| Liabilities due under split interest agreements[5] | | $ 819,584 | | | **819,584** | **859,744** |
| **NON-INVESTMENT LIABILITIES SUBJECT TO FAIR VALUE LEVELING** | | **$ 819,584** | | | **$ 819,584** | **$ 859,744** |
| **TOTAL LIABILITIES** | | | | | **$ 1,697,602** | **$ 1,734,885** |

[1] *Certain prior year amounts have been reclassified to conform to current year presentation.*

[2] *This excludes money markets held in "Cash and cash equivalents" on the* Balance Sheets *of $65.0 million as of June 30, 2020, which are Level 1 investments. There were no money markets held in "Cash and cash equivalents" as of June 30, 2019.*

[3] *As of June 30, 2020, other assets not subject to fair value consists primarily of receivables for transactions that settled subsequent to the balance sheet date of $1,189,950, before eliminating inter-company balances, and consolidated assets of $146,365. As of June 30, 2019, other assets not subject to fair value consist primarily of receivables for transactions that settled subsequent to the balance sheet date of $599,651, before eliminating inter-company balances, and consolidated assets of $159,745.*

[4] *As of June 30, 2020 and 2019, total investments, net equal $47,447,433 and $45,898,800, respectively.*

[5] *Amounts excluded from investments and included separately on the University's* Balance Sheets.

[6] *Includes fair value of an interest rate exchange agreement on the University's debt portfolio of $44,241 and $27,409 as of June 30, 2020 and 2019, respectively.*

[7] *As of June 30, 2020 and 2019, other liabilities not subject to fair value include consolidated liabilities of $167,795 and $199,693, respectively.*

The following is a rollforward of Level 3 investments for the year ended June 30, 2020 and the condensed June 30, 2019 rollforward of Level 3 investments (in thousands of dollars).

| | Beginning balance as of July 1, 2019 | Net realized gains/(losses) | Net change in unrealized appreciation (depreciation)[1] | Purchases/ contributions | Sales/ distributions | Ending balance as of June 30, 2020 |
|---|---|---|---|---|---|---|
| **INVESTMENT ASSETS:** | | | | | | |
| High yield | $ 234,110 | $ 328 | $ (9,850) | $ 443,087 | $ (403,223) | **$ 264,452** |
| Private equity | 289,143 | (17,187) | 85,395 | 219,633 | (99,126) | **477,858** |
| Natural resources | 1,878,205 | 103,248 | (258,527) | 261,320 | (692,335) | **1,291,911** |
| Real estate | 48,644 | 60 | (23,417) | | (660) | **24,627** |
| Due from brokers | 4,638 | | (9) | | | **4,629** |
| Other investments | 7,609 | 1,143 | (2,040) | | | **6,712** |
| **INVESTMENT ASSETS SUBJECT TO FAIR VALUE LEVELING** | **$ 2,462,349** | **$ 87,592** | **$ (208,448)** | **$ 924,040** | **$ (1,195,344)** | **$ 2,070,189** |
| Interests in trusts held by others | $ 420,371 | | $ 6,988 | | | **427,359** |
| **NON-INVESTMENT ASSETS SUBJECT TO FAIR VALUE LEVELING** | **$ 420,371** | | **$ 6,988** | | | **$ 427,359** |
| **TOTAL ASSETS SUBJECT TO FAIR VALUE LEVELING** | **$ 2,882,720** | **$ 87,592** | **$ (201,460)** | **$ 924,040** | **$ (1,195,344)** | **$ 2,497,548** |
| **INVESTMENT LIABILITIES:** | | | | | | |
| Other liabilities subject to fair value | $ 288,372 | | $ (2,493) | $ (76,849) | $ 37,380 | **$ 246,410** |
| **TOTAL LIABILITIES SUBJECT TO FAIR VALUE LEVELING** | **$ 288,372** | **$ 0** | **$ (2,493)** | **$ (76,849)** | **$ 37,380** | **$ 246,410** |
| **NET ASSETS SUBJECT TO FAIR VALUE LEVELING** | **$ 2,594,348** | **$ 87,592** | **$ (198,967)** | **$ 1,000,889** | **$ (1,232,724)** | **$ 2,251,138** |

[1] *Total change in unrealized appreciation/(depreciation) relating to Level 3 investment assets and investment liabilities still held by the University at June 30, 2020 is $(233,329) and is reflected in "Realized and change in unrealized appreciation/(depreciation), net" in the* Statements of Changes in Net Assets.

| | Beginning balance as of July 1, 2018 | Net realized gains/(losses) | Net change in unrealized appreciation (depreciation)[1] | Purchases/ contributions | Sales/ distributions | Transfers out of Level 3 | Ending balance as of June 30, 2019 |
|---|---|---|---|---|---|---|---|
| **PRIOR YEAR NET ASSETS SUBJECT TO FAIR VALUE LEVELING[2]** | **$ 2,909,705** | **$ (71,820)** | **$ (121,636)** | **$ 288,911** | **$ (238,778)** | **$ (172,034)** | **$2,594,348** |

[1] *Total change in unrealized appreciation/(depreciation) relating to Level 3 investment assets and investment liabilities still held by the University at June 30, 2019 is $(219,543) and is reflected in "Realized and change in unrealized appreciation/(depreciation), net" in the* Statements of Changes in Net Assets.
[2] *Certain prior year amounts have been reclassified to conform to current year presentation.*

## Investment strategy and risk

The University utilizes a number of wholly owned subsidiary entities to support its investment activities. The consolidated financial statements include all assets, liabilities, income, and expenses associated with these entities and intercompany accounts and transactions have been eliminated during consolidation.

The University's investment strategy incorporates a diversified asset allocation approach and maintains, within defined limits, exposure to the movements of the global public and private equity, fixed income, real estate, and commodities markets. Exposure to these markets is achieved through direct investments in individual securities, investments in special purpose vehicles and/or through investments in vehicles advised by external managers.

Investments in global markets involve a multitude of risks such as price, interest rate, market, sovereign, currency, liquidity and credit risks, amongst many others. Additionally, the University's direct investments in natural resources expose it to a unique set of risks, namely environmental, social and geopolitical risks in some of the jurisdictions where these direct investments reside. The University manages exposure to these risks through established policies and procedures related to its ongoing investment diligence and operational due diligence programs. The University also considers manager concentration risk. As of June 30, 2020, 18% of the GIA NAV was invested across 5 diversified fund managers. The University anticipates that the value and composition of its investments may, from time to time, fluctuate substantially in response to any or all of the risks described herein.

## Liquidity

Cash, cash equivalents, and short-term investments are recorded at cost, which approximates fair value, and includes cash in bank accounts, institutional money market funds and other temporary investments held for working capital purposes with original maturities of three months or less. Cash, cash equivalents, and short-term investments do not include cash balances held as collateral by the University. Cash, cash equivalents, and short-term investment balances designated for investment purposes are included in the "Investment portfolio, at fair value" in the *Balance Sheets*.

The University has various sources of liquidity at its disposal within its investment pools, including money markets of $1.1 billion and repurchase agreements of $0.5 billion at June 30, 2020. In addition, the University estimates that as of the balance sheet date, it could have liquidated additional unencumbered US government securities of $2.7 billion within one business day (assuming typical settlement terms) to meet any immediate short-term needs of the University (unaudited).

## Repurchase agreements

The University *Balance Sheets* display the assets generated by repurchase transactions. The University enters into these transactions under agreements containing master netting arrangements. The University requires the fair value of the collateral exchanged under these agreements to be equal to or in excess of the total amount of the agreement, including interest where applicable. At June 30, 2020 and 2019 the University had gross asset repurchase agreements of $0.5 billion and $0.8 billion which were fully collateralized. The University does not offset repurchase agreements that are subject to master netting arrangements or similar arrangements on the University's *Balance Sheets*.

## Dividend and interest income

Dividend income is recognized net of applicable withholding taxes on the ex-dividend date. Non-cash dividends are recorded at the fair value of the securities received. Interest income and expense is recorded net of applicable withholding taxes, on an accrual basis. The University amortizes bond premiums and accretes bond discounts using the effective yield method and when cash collection is expected.

## Traded securities

Instruments listed or traded on a securities exchange are valued at the last quoted price on the primary exchange where the security is traded. Where there is no readily available closing price on the valuation date, long positions are valued at the bid price and short positions are valued at the ask price. Restrictions that are attached to a security are factored into the valuation of that security, reflective of the estimated impact of those restrictions. Investments in non-exchange traded debt and equity instruments are primarily valued using inputs provided by independent pricing services or by broker/dealers who actively make markets in these securities.

## Derivatives

The University uses a variety of financial instruments with off-balance sheet risk involving contractual or optional commitments for future settlement, which are exchange traded or executed over the counter (OTC). These instruments are used to (1) manage exposure to certain asset classes and/or various market risks, (2) arbitrage mispricings of related securities and (3) to manage the interest, cost and risk associated with its outstanding and/or future debt. These instruments are classified as due to/from brokers and may include option, swap, credit default, interest rate, and forward contracts. These types of instruments are primarily valued using industry standard models with independent market inputs, or by broker quotes. Inputs such as prices, spreads, curves, and/or broker quotes are evaluated for source reliability and consistency with industry standards. Counterparty marks obtained and utilized to determine daily collateral requirements are also used to corroborate input reasonability. The University considers current market conditions including interest rate and credit risks in its evaluation of inputs, pricing methodologies, and models utilized to determine fair values.

In connection with its investments in derivatives, the University maintains master netting agreements and collateral agreements with its counterparties. These agreements provide the University the right, in the event of default by the counterparty (such as bankruptcy or a failure to pay or perform), 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. Collateral, generally in the form of debt obligations issued by the US Treasury, is exchanged on a daily basis as required by fluctuations in the market.

Specific credit limits are established for counterparties based on their individual credit ratings. Credit limits are monitored daily by the University and are adjusted according to policy, as necessary. Some of the financial instruments entered into by the University contain credit-risk-related contingency features that allow the parties to the agreement to demand immediate payment for outstanding contracts and/or collateral.

The following table presents information about the University's derivatives by primary risk exposure for the years ended June 30, 2020 and 2019 (in thousands of dollars):

| | As of June 30, 2020 | | | For the year ended June 30, 2020 | As of June 30, 2019 | | | For the year ended June 30, 2019 |
|---|---|---|---|---|---|---|---|---|
| Primary risk exposure | Average Quarterly Notional | Gross derivative assets | Gross derivative liabilities | Net profit/ (loss)[4] | Average Quarterly Notional | Gross derivative assets | Gross derivative liabilities | Net profit/ (loss)[4] |
| Equity instruments | $ 3,443,938 | $ 59,867 | $ 122,097 | $ 92,208 | $ 1,686,686 | $ 63,618 | $ 25,824 | $ 10,413 |
| Fixed income instruments[1] | 117,000 | | 44,241 | (19,070) | 117,000 | | 27,409 | (13,880) |
| Currency instruments | 21,020 | 10 | 14 | (150) | 1,151,191 | 527 | 468 | (1,408) |
| Credit instruments | 4,723 | 4,703 | | 21 | 4,726 | 4,723 | | 12 |
| **SUBTOTAL** | | **$ 64,580** | **$ 166,352** | **$ 73,009** | | **$ 68,868** | **$ 53,701** | **$ (4,863)** |
| **TOTAL COUNTERPARTY NETTING[2]** | | **(34,984)** | **(34,984)** | | | **(19,789)** | **(19,789)** | |
| **NET AMOUNTS INCLUDED IN THE BALANCE SHEETS[3]** | | **29,596** | **131,368** | | | **49,079** | **33,912** | |
| **TOTAL SECURITIES COLLATERAL RECEIVED/POSTED[5]** | | **23,586** | **189,564** | | | **52,579** | **26,690** | |
| **NET AMOUNT** | | **6,010** | **(58,196)** | | | **(3,500)** | **7,222** | |
| **NET AMOUNT IN ACCORDANCE WITH ASC 210[6]** | | **$ 6,010** | **$ 0** | | | **$ 0** | **$ 7,222** | |

[1] *For the years ended June 30, 2020 and 2019, balances represent an interest rate exchange on the University's debt portfolio.*
[2] *GAAP permits the netting of derivative assets and liabilities and the related cash collateral received and paid when a legally enforceable master netting agreement exists between the University and a derivative counterparty.*
[3] *Included within the "Investment portfolio, at fair value" and "Other liabilities associated with the investment portfolio" line items of the* Balance Sheets.
[4] *Included within "Realized and change in unrealized appreciation/(depreciation), net" within the* Statements of Changes in Net Assets.
[5] *Includes securities posted to meet initial margin requirements on exchange traded futures.*
[6] *Excludes any over-collaterized net amounts in accordance with ASC 210.*

## External advisors

Investments managed by external advisors include investments in private equity, real estate, natural resources, hedge funds and other externally managed funds. The University generally utilizes the capital account balance provided by the external advisor as a practical expedient to fair value. To evaluate the adequacy of these fair value measurements, the University has assessed factors including, but not limited to, the external advisor's adherence to fair value principles in calculating the capital account balance, the existence of transactions at NAV at the measurement date and the existence or absence of certain restrictions at the measurement date. In addition, the University evaluates these external advisors through ongoing due diligence and operational oversight, which includes an analysis of an advisor's use of and adherence to fair value principles.

The University, as an investor, has commitments to make periodic contributions in future periods to the investments managed by external advisors. The amounts of these expected disbursements as of June 30, 2020 and 2019 are disclosed below (in thousands of dollars):

| | As of June 30, 2020 | | | As of June 30, 2019 | | |
|---|---|---|---|---|---|---|
| | Fair value[1] | Remaining unfunded commitments | Estimated remaining life[2] | Fair value[1,4] | Remaining unfunded commitments[4] | Estimated remaining life[2] |
| Private equity funds | $ 9,017,706 | $ 6,813,583 | 4 – 10 | $ 7,943,838 | $ 6,536,799 | 4 – 10 |
| Real estate funds | 3,154,066 | 1,734,565 | 4 – 10 | 3,556,511 | 1,702,201 | 4 – 10 |
| Other externally managed funds[3] | 3,386,081 | 2,221,023 | 2 – 8 | 3,660,687 | 2,460,983 | 2 – 8 |
| **TOTAL** | **$ 15,557,853** | **$ 10,769,171** | | **$ 15,161,036** | **$ 10,699,983** | |

[1] *Represents the fair value of the funded portion of investments with remaining unfunded commitments.*
[2] *The estimated remaining lives of these funds, expressed in years, are forward-looking projections based on the University's estimates and could vary significantly depending on the investment decisions of external managers, changes in the University's investment portfolio, and other circumstances.*
[3] *Other externally managed funds primarily includes exposure to hedge funds and natural resources.*
[4] *Certain prior year amounts have been reclassified to conform to current year presentation.*

Investments in externally managed funds generally have limited redemption options for investors and, subsequent to final closing, may or may not permit subscriptions by new or existing investors. These entities may also have the ability to impose gates, lockups and other restrictions on an investor's ability to readily redeem out of their investment interest in the fund.

## Direct Investments

Direct investments in natural resources and private equity are primarily valued using a combination of independent appraisals and/or one or more industry standard valuation techniques (e.g., income approach, market approach, or cost approach). The income approach is primarily based on the investment's anticipated future income using one of two principal methods: the discounted cash flow method or the capitalization method. Inputs and estimates developed and utilized with these techniques may be subjective, unobservable, and require judgment regarding significant matters such as estimating the amount and timing of future cash flows, forward pricing assumptions and the selection of discount and capitalization rates that appropriately reflect market and credit risks. The market approach derives investment value through comparison to recent and relevant market transactions with similar investment characteristics. The cost approach is utilized when the cost of the investment is determined to be the best representation of fair value. This method is typically used for newly purchased or undeveloped assets. When applicable, the University examines market data and collaborates closely with independent appraisers to arrive at the best estimation of fair value for each respective asset. The HMC Board of Directors discusses the valuation process and results with HMC management, and makes determinations on significant matters impacting valuation that may arise from time to time.

The following table presents the ranges of significant unobservable inputs used to value the University's Level 3 assets. While the inputs described below represent the range of inputs utilized as of the measurement date, these inputs may change over time, which may have a material effect on the valuation of these types of investments in the future.

| | As of June 30, 2020 | | | As of June 30, 2019 | | |
|---|---|---|---|---|---|---|
| Significant unobservable input by asset class[1,3,4] | Level 3 investments subject to fair value (in thousands of dollars)[2] | Range of inputs utilized in valuation model | Weighted average of inputs utilized in valuation model | Level 3 investments subject to fair value (in thousands of dollars)[2] | Range of inputs utilized in valuation model | Weighted average of inputs utilized in valuation model |
| Natural resources: | $ 469,811 | | | $ 1,878,205 | | |
| Income approach discount rate | | 6.0% – 16.0% | 10.8% | | 6.0% – 16.0% | 10.2% |
| Price per planted hectare | | $1,073 – $156,351 | $36,646 | | $1,073 – $164,937 | $43,431 |
| Price per gross hectare | | $168 – $57,530 | $10,393 | | $168 – $57,422 | $15,231 |
| Discount for lack of marketability | | 2.0% – 20.0% | 16.7% | | 2.0% – 20.0% | 9.0% |
| High yield: | 264,027 | | | 233,681 | | |
| Shadow rating discount rate | | 6.8% – 15.8% | 8.6% | | 6.8% – 8.9% | 8.0% |
| Collateral coverage market risk factor | | 100% | 100% | | 100% | 100% |
| EBITDA multiple | | 9.0x – 19.5x | 13.3x | | 11.3x – 13.5x | 11.9x |
| Real estate: | 22,868 | | | 32,661 | | |
| Income approach discount rate | | 14.5% | 14.5% | | 11.5% – 13.5% | 12.5% |
| Income approach growth rate | | 3.0% | 3.0% | | 3.0% | 3.0% |
| Discount for lack of marketability | | 15.0% | 15.0% | | 15.0% | 15.0% |
| Private equity: | 150,294 | | | 131,329 | | |
| Income approach discount rate | | 6.0% – 15.0% | 14.0% | | 6.0% – 15.0% | 12.4% |
| EBITDA multiple | | 8.7x | 8.7x | | 8.7x | 8.7x |
| Book value multiplier | | | | | 0.6x | 0.6x |
| Other liabilities subject to fair value | (246,410) | | | (288,372) | | |
| Loan to value | | 5.0% – 43.5% | 16.8% | | 8.7% – 43.5% | 22.4% |
| Market interest rate | | 3.5% – 6.5% | 3.9% | | 2.5% – 10.5% | 5.2% |
| **NET AMOUNT** | **$ 660,590** | | | **$ 1,987,504** | | |

[1] *The fair value of investments may be determined using multiple valuation techniques.*
[2] *Included within Level 3 investments is $1,590,548 and $606,844 as of June 30, 2020 and 2019, respectively, which were valued using other inputs including, but not limited to, single source broker quotations, third party pricing, and prior transactions.*
[3] *The range of inputs encompasses a variety of investment types within each asset class.*
[4] *Certain prior year amounts have been reclassified to conform to current year presentation.*

## 4. RECEIVABLES

The major components of receivables, net of reserves for doubtful accounts of $13.9 million and $12.2 million as of June 30, 2020 and 2019, respectively, were as follows (in thousands of dollars):

| | 2020 | 2019 |
|---|---|---|
| Federal sponsored support | **$ 61,939** | $ 71,425 |
| Publications | **48,085** | 62,872 |
| Executive education | **50,155** | 62,842 |
| Tuition and fees | **22,108** | 19,146 |
| Non-federal sponsored support | **9,950** | 10,821 |
| Gift receipts | **9,263** | 4,430 |
| Other | **61,231** | 64,785 |
| **TOTAL RECEIVABLES, NET** | **$ 262,731** | **$ 296,321** |

## 5. NOTES RECEIVABLE

Notes receivable are recorded initially at face value plus accrued interest, which approximates fair value. Notes receivable, and related allowance for doubtful accounts, were as follows (in thousands of dollars):

| | 2020 | | | 2019 | | |
|---|---|---|---|---|---|---|
| | Receivable | Allowance | Net | Receivable | Allowance | Net |
| Student Loans: | | | | | | |
| Government revolving | $ 39,382 | $ 999 | **$ 38,383** | $ 49,213 | $ 1,266 | **$ 47,947** |
| Institutional | 83,000 | 2,284 | **80,716** | 86,467 | 2,481 | **83,986** |
| Federally insured | — | — | — | 344 | 159 | **185** |
| Total student loans | 122,382 | 3,283 | **119,099** | 136,024 | 3,906 | **132,118** |
| Faculty and staff loans | 244,642 | 179 | **244,463** | 234,148 | 179 | **233,969** |
| Other loans | 39,257 | 30,585 | **8,672** | 29,475 | 21,939 | **7,536** |
| **TOTAL** | **$ 406,281** | **$ 34,047** | **$ 372,234** | **$ 399,647** | **$ 26,024** | **$ 373,623** |

Government revolving loans are funded principally with federal advances to the University under the Perkins Loan, the Health Professions Student Loan (HPSL) and Loans for Disadvantaged Students in Health Professions (LDS) Programs. These advances totaled $44.7 million and $66.7 million as of June 30, 2020 and 2019, respectively, and are classified as liabilities in the *Balance Sheets*. During fiscal year 2018, the Perkins Loan Program ended and as a result the University began making required repayments to the government. In fiscal year 2019, an annual repayment was not due while the Department of Education calculated the reimbursement owed to the University for public service cancellations since fiscal year 2010, as required by law. The University made a catch up payment of $22 million in fiscal year 2020 for both years. Interest earned on the revolving and institutional loan programs is reinvested to support additional loans. The repayment and interest rate terms of the institutional loans vary considerably.

Faculty and staff notes receivable primarily consists of mortgage and educational loans. Mortgages include shared appreciation loans, loans that bear interest at the applicable federal rate and interest-free loans. In addition, certain mortgages that bear interest at the current market rate or applicable federal rate may be subsidized for an initial period. The educational loans are primarily zero-interest loans.

The University assesses the adequacy of the allowance for doubtful accounts by evaluating the loan portfolio, including such factors as 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, the value of any collateral, and, where applicable, the existence of any guarantees or indemnifications. In addition to these factors, the University reviews the aging of the loans receivable and the default rate in comparison to prior years. The allowance is adjusted based on these reviews. The University considers the allowance at June 30, 2020 and 2019 to be reasonable and adequate to absorb potential credit losses inherent in the loan portfolio.

## 6. PLEDGES RECEIVABLE

Unconditional promises to donate to the University in the future are initially recorded at fair value (pledge net of discount) and subsequently amortized over the expected payment period, net of an allowance for uncollectible pledges. The University's indicative 1- to 5-year taxable unsecured borrowing rate is used to discount pledges receivable at the end of the fiscal year they are received. Discounts of $100.2 million and $149.6 million for the years ended June 30, 2020 and 2019, respectively, were calculated using rates ranging from 0.77% to 3.10%.

Pledges receivable included in the financial statements as of June 30, 2020 and 2019 are expected to be realized as follows (in thousands of dollars):

| | 2020 | 2019 |
|---|---|---|
| Within one year | **$ 354,025** | $ 408,858 |
| Between one and five years | **1,416,099** | 1,635,428 |
| More than five years | **880,909** | 992,743 |
| Less: discount and allowance for uncollectible pledges | **(247,858)** | (271,202) |
| **TOTAL PLEDGES RECEIVABLE, NET** | **$ 2,403,175** | **$ 2,765,827** |

Pledges receivable as of June 30, 2020 and 2019 have been designated for the following purposes (in thousands of dollars):

| | 2020 | 2019 |
|---|---|---|
| General Operating Account balances: | | |
| Gifts for current use | **$ 624,440** | $ 744,871 |
| Non-federal sponsored awards | **193,641** | 215,972 |
| Facilities and loan funds | **265,741** | 294,180 |
| Total General Operating Account balances | **1,083,822** | **1,255,023** |
| Endowment | **1,319,353** | 1,510,804 |
| **TOTAL PLEDGES RECEIVABLE, NET** | **$ 2,403,175** | **$ 2,765,827** |

Because of uncertainties with regard to realizability and valuation, bequest intentions and other conditional promises are only recognized as assets if and when the specified conditions are met. Non-bequest conditional pledges totaled $56.7 million and $49.8 million as of June 30, 2020 and 2019, respectively.

## 7. FIXED ASSETS

Fixed assets are reported at cost or, if a gift, at fair value as of the date of the gift, net of accumulated depreciation. Depreciation is computed using the straight-line method over the estimated useful lives of the assets.

The major categories of fixed assets as of June 30, 2020 and 2019 are summarized as follows (in thousands of dollars):

| | 2020 | 2019 | Estimated useful life (in years) |
|---|---|---|---|
| Research facilities | **$ 2,494,333** | $ 2,432,190 | * |
| Classroom and office facilities | **2,401,659** | 2,291,410 | 35 |
| Housing facilities | **2,264,147** | 2,241,939 | 35 |
| Other facilities | **455,847** | 448,844 | 35 |
| Service facilities | **804,215** | 778,149 | 35 |
| Libraries | **509,095** | 479,741 | 35 |
| Museums and assembly facilities | **979,825** | 959,455 | 35 |
| Athletic facilities | **246,291** | 235,910 | 35 |
| Land | **1,042,977** | 1,023,726 | N/A |
| Construction in progress | **1,401,333** | 1,297,194 | N/A |
| Equipment | **1,367,264** | 1,281,259 | ** |
| **SUBTOTAL AT COST** | **13,966,986** | **13,469,817** | |
| Less: accumulated depreciation | **(5,531,731)** | (5,198,106) | |
| **FIXED ASSETS, NET** | **$ 8,435,255** | **$ 8,271,711** | |

** Estimated useful lives of components range from 10 to 45 years.*
*** Estimated useful lives of equipment range from 3 to 10 years.*

Certain University facilities are subject to restrictions as to use, structural modifications, and ownership transfer. Included in the fixed asset balances are restricted facilities with a net book value of $304.6 million and $303.0 million as of June 30, 2020 and 2019, respectively.

The costs of research facilities are separated into the shell, roof, finishes, fixed equipment, and services. These components are separately depreciated.

Equipment includes general and scientific equipment, computers, software, furniture, and vehicles.

The University has asset retirement obligations of $200.7 million and $176.8 million, which are included in "Deferred revenue and other liabilities" in the *Balance Sheets* as of June 30, 2020 and 2019, respectively.

For the period ended June 30, 2020, right of use assets from finance leases of $67.0 million are included in "Fixed assets" and lease liabilities from finance leases of $104.9 million are included in "Deferred revenue and other liabilities" in the *Balance Sheets*.

## 8. ENDOWMENT AND GENERAL OPERATING ACCOUNT NET ASSETS

The University's net assets consisted of the following as of June 30, 2020 and 2019 (in thousands of dollars):

| | 2020 | | | 2019 | | |
|---|---|---|---|---|---|---|
| | Without donor restrictions | With donor restrictions | Total | Without donor restrictions | With donor restrictions | Total |
| **NATURE OF SPECIFIC NET ASSETS** | | | | | | |
| Perpetual endowment funds | | $ 8,178,308 | **$ 8,178,308** | | $ 7,848,495 | $ **7,848,495** |
| Endowment funds and appreciation, subject to distribution policy and appropriation | | 24,628,858 | **24,628,858** | | 24,092,097 | **24,092,097** |
| Endowment funds without restriction, board designated and subject to distribution policy | $ 7,374,810 | | **7,374,810** | $ 7,091,584 | | **7,091,584** |
| Pledge balances | | 1,319,353 | **1,319,353** | | 1,510,804 | **1,510,804** |
| Interests in trusts held by others | | 393,051 | **393,051** | | 386,720 | **386,720** |
| **TOTAL ENDOWMENT** | **7,374,810** | **34,519,570** | **41,894,380** | **7,091,584** | **33,838,116** | **40,929,700** |
| Operating | 4,922,307 | | **4,922,307** | 4,890,118 | | 4,890,118 |
| Unexpended contributions and endowment distributions | | 2,655,577 | **2,655,577** | | 2,784,170 | 2,784,170 |
| Student loan funds | | 99,259 | **99,259** | | 99,129 | 99,129 |
| **TOTAL GENERAL OPERATING ACCOUNT** | **4,922,307** | **2,754,836** | **7,677,143** | **4,890,118** | **2,883,299** | **7,773,417** |
| Split interest agreements *(Note 9)* | | **598,193** | **598,193** | | **573,369** | **573,369** |
| **TOTAL NET ASSETS** | **$ 12,297,117** | **$ 37,872,599** | **$ 50,169,716** | **$ 11,981,702** | **$ 37,294,784** | **$ 49,276,486** |

### Endowment

The University's endowment consists of 14,033 separate funds established over many years for a wide variety of purposes. Endowment fund balances are classified and reported in accordance with donor specifications and state law. The endowment includes both donor-restricted endowment funds and funds functioning as endowment which are not subject to donor-imposed restrictions, however decisions to spend their principal require the approval of the Corporation and therefore are classified as Board-designated endowment funds. The majority of the endowment is invested in the GIA *(Note 3)*.

The University is also the beneficiary of certain irrevocable trusts held and administered by others. The estimated fair values of trust assets, which include the present values of expected future cash flows from outside trusts and the fair value of the underlying assets of perpetual trusts, are recognized as assets and increases in net assets when the required trust documentation is provided to the University.

The fair values of these trusts are provided by the external trustees and are adjusted annually by the University. These are included as Level 3 investments in the fair value hierarchy table in *Note 3*.

The University's endowment distribution policies are designed to preserve the value of the endowment in real terms (after inflation) and generate a predictable stream of available income. Each fall, the Corporation approves the endowment distribution for the following fiscal year. Distribution from an underwater endowment fund (a fund below its historic dollar value) could continue in limited and defined circumstances under the University's endowment

distribution policy. To the extent that the fair value of a donor restricted endowment fund falls below its historic dollar value it would be reported as a reduction of net assets with donor restrictions.

At June 30, 2020 and 2019, funds in a deficit position were reported in net assets with donor restrictions and are comprised as follows (in thousands):

| | 2020 | 2019 |
|---|---|---|
| Fair value of underwater endowment funds | **$ 20,355** | $ 27,240 |
| Historic dollar value | **22,605** | 32,672 |
| **TOTAL DEFICIT OF UNDERWATER ENDOWMENT FUNDS** | **$ (2,250)** | **$ (5,432)** |

The endowment distribution is based in part on presumptive guidance from a formula that is intended to provide budgetary stability by smoothing the impact of annual investment gains and losses. The formula's inputs reflect expectations about long-term returns and inflation rates. For fiscal year 2020, the endowment distribution approved by the Corporation (prior to decapitalizations) was equal to 5.2% of the fair value of the endowment invested in the GIA as of the beginning of the fiscal year. The total endowment distribution made available for operations was $2.0 billion and $1.9 billion in fiscal year 2020 and 2019, respectively.

Each year the Corporation also approves certain decapitalizations from the endowment to support strategic, mission-critical activities or objectives that are typically one-time or time-limited and therefore, are excluded from net operating surplus. These decapitalizations totaled $35.7 million and $32.2 million in fiscal year 2020 and 2019, respectively. These additional decapitalizations, in combination with the endowment distribution, resulted in an aggregate payout rate of 5.2% and 5.1% in fiscal year 2020 and 2019, respectively.

### General operating account

The GOA consists of the general or current funds of the University as well as the assets and liabilities related to student and faculty loans and facilities. The GOA accepts, manages, and pays interest on deposits made by University departments; invests surplus working capital; makes loans; and arranges external financing for major capital projects. It is used to manage, control, and execute all University financial transactions, except for those related to investment activities conducted by HMC.

## 9. SPLIT INTEREST AGREEMENTS

Under split interest agreements, donors enter into trust or other arrangements with the University in which the University receives benefits that are shared with other beneficiaries and institutions. Split interest agreement (SIA) investment assets are invested primarily in the GIA and publicly-traded securities, a small segment is managed by an external advisor, and all are recorded in the "Investment portfolio, at fair value" in the University's *Balance Sheets*. Additional disclosures are included in *Note 3*. Associated liabilities are recorded at the present value of estimated future payments due to beneficiaries and other institutions. These liabilities are calculated using the University's current taxable unsecured borrowing rate of 0.8% and 2.1% as of June 30, 2020 and 2019, respectively. All split interest agreement net assets and the respective activity are reported within net assets with donor restrictions. Upon termination of a split interest agreement, the net assets are transferred to the GOA or endowment accordingly.

The changes in split interest agreement net assets for fiscal years 2020 and 2019 were as follows (in thousands of dollars):

| | 2020 | 2019 |
|---|---|---|
| Investment return: | | |
| Investment income | **$ 13,101** | $ 13,807 |
| Realized and change in unrealized appreciation, net | **37,420** | 45,694 |
| Total investment return | **50,521** | 59,501 |
| Gifts *(Note 14)*[1] | **9,709** | 8,437 |
| Payments to annuitants | **(66,351)** | (65,770) |
| Transfers to endowment | **(12,136)** | (15,213) |
| Transfers between SIA and the GOA | **(11,916)** | (13,886) |
| Change in liabilities and other adjustments | **54,997** | 41,149 |
| **NET CHANGE DURING THE YEAR** | **24,824** | **14,218** |
| Total split interest agreement net assets, beginning of year | **573,369** | 559,151 |
| **TOTAL SPLIT INTEREST AGREEMENT NET ASSETS, END OF YEAR** | **$ 598,193** | **$ 573,369** |

[1] *Shown at net present value. The undiscounted value of these gifts was $27,237 and $18,508 for the years ended June 30, 2020 and 2019, respectively.*

Split interest agreement net assets as of June 30, 2020 and 2019 consisted of the following (in thousands of dollars):

| | 2020 | 2019 |
|---|---|---|
| Split interest agreement investments *(Note 3)* | | |
| Charitable remainder trusts | **$ 936,417** | $ 930,742 |
| Charitable lead trusts | **94,401** | 125,040 |
| Charitable gift annuities | **255,696** | 249,917 |
| Pooled income funds | **131,263** | 127,414 |
| Total split interest agreement investments[1] | **1,417,777** | **1,433,113** |
| | | |
| Liabilities due under split interest agreements: | | |
| Amounts due to beneficiaries | **(751,217)** | (792,558) |
| Amounts due to other institutions | **(68,367)** | (67,186) |
| Total liabilities due under split interest agreements | **(819,584)** | **(859,744)** |
| | | |
| **TOTAL SPLIT INTEREST AGREEMENT NET ASSETS, END OF YEAR** | **$ 598,193** | **$ 573,369** |

[1] *For the year ended June 30, 2020, $803,490 of SIA investments are held in the pooled general investment account and $614,287 of SIA investments are held in the other investments outside the general investment account. For the year ended June 30, 2019, $780,737 of SIA investments are held in the pooled general investment account and $652,376 of SIA investments are held in the other investments outside the general investment account. Refer to* Note 3.

## 10. BONDS AND NOTES PAYABLE

Bonds and notes payable as of June 30, 2020 and 2019 were as follows (in thousands of dollars):

| | Fiscal year of issue | Fiscal Year of final maturity[1] | Effective rate[2] | Outstanding principal 2020[3] | Outstanding principal 2019[3] |
|---|---|---|---|---|---|
| **TAX-EXEMPT BONDS AND COMMERCIAL PAPER:** | | | | | |
| Variable-rate demand bonds and commercial paper: | | | | | |
| Series R – daily | 2000-2006 | 2033 | 0.9% | $ 131,200 | $ 131,200 |
| Series Y – weekly | 2000 | 2036 | 1.2% | 117,905 | 117,905 |
| Commercial paper | 2020 | — | 1.3% | | 350,000 |
| Total variable-rate bonds and commercial paper | | | 1.2% | 249,105 | 599,105 |
| | | | | | |
| Fixed-rate bonds: | | | | | |
| Series N | 1992 | 2020 | 6.3% | | 80,000 |
| Series 2010A | 2010 | 2022 | 4.8% | 49,590 | 49,590 |
| Series 2010B | 2011 | 2024 | 4.9% | 97,740 | 110,235 |
| Series 2016A | 2017 | 2041 | 3.9% | 1,513,780 | 1,539,720 |
| Series 2020A | 2020 | 2031 | 2.6% | 346,680 | |
| Total fixed-rate bonds | | | 4.0% | 2,007,790 | 1,779,545 |
| | | | | | |
| **TOTAL TAX-EXEMPT BONDS AND COMMERCIAL PAPER** | | | **3.4%** | **2,256,895** | **2,378,650** |
| | | | | | |
| **TAXABLE BONDS AND COMMERCIAL PAPER** | | | | | |
| | | | | | |
| Fixed-rate bonds: | | | | | |
| Series 2008A | 2008 | 2039 | 5.6% | 243,000 | 243,000 |
| Series 2008D | 2009 | 2039 | 6.5% | 500,000 | 500,000 |
| Series 2010C | 2011 | 2041 | 4.9% | 300,000 | 300,000 |
| Series 2013A | 2013 | 2038 | 3.4% | 402,000 | 402,000 |
| Series 2016B | 2017 | 2057 | 3.3% | 1,000,000 | 1,000,000 |
| Series 2020B | 2020 | 2051 | 2.5% | 500,000 | |
| Total fixed-rate bonds | | | 4.3% | 2,945,000 | 2,445,000 |
| | | | | | |
| **TOTAL TAXABLE BONDS AND COMMERCIAL PAPER** | | | **4.3%** | **2,945,000** | **2,445,000** |
| | | | | | |
| Notes payable | Various | Various | Various | 87,841 | 87,405 |
| Unamortized bond issuance costs and original issuance premium/discount, net | | | | 374,943 | 302,294 |
| **TOTAL BONDS AND NOTES PAYABLE** | | | **3.9%** | **$ 5,664,679** | **$ 5,213,349** |

[1] *The weighted average maturity of the portfolio on June 30, 2020 was 18.8 years.*
[2] *One-year average for variable rate debt. Exclusive of interest rate exchange agreement, which would increase the overall portfolio rate by 0.05% (3.93% vs. 3.88%).*
[3] *Par only—balances exclude original issuance premiums/discounts.*

Interest expense related to bonds and notes payable was $179.5 million and $183.7 million for fiscal 2020 and 2019, respectively. The interest expense in the *Statement of Changes in Net Assets with General Operating Account Detail* includes additional components related to capital leases. Excluding unamortized discounts and premiums, unamortized bond issuance costs, scheduled principal payments are (in thousands of dollars):

| Fiscal year | Principal payments |
|---|---|
| 2021 | $ 88,185 |
| 2022 | 109,619 |
| 2023 | 54,890 |
| 2024 | 101,853 |
| 2025 | 41,441 |
| Thereafter | 4,893,748 |
| **TOTAL PRINCIPAL PAYMENTS** | **$ 5,289,736** |

In fiscal 2020, the University issued $346.7 million of tax-exempt fixed-rate Series 2020A Bonds and $500.0 million of taxable fixed-rate Series 2020B Bonds. Proceeds from the Series 2020A issue were used to refinance the University's $450 million outstanding Series EE tax-exempt commercial paper. Proceeds from the Series 2020B issue were used to fund institutional liquidity and capital spending. In connection with the issuance of Series 2020A and Series 2020B, the University's AAA/Aaa credit ratings were affirmed by Standard & Poor's Global Ratings and Moody's Investors Service, respectively.

The University has one unsecured, revolving credit facility totaling $1.5 billion, which expires in March 2022. There was no outstanding drawn balance on the credit facility at June 30, 2020.

In February 2020, the University obtained reauthorization of its $1 billion tax-exempt commercial paper program. The University has a taxable commercial paper program available totaling $2 billion. There was no outstanding drawn balance on either commercial paper program at June 30, 2020.

As of June 30, 2020, the University had $249.1 million of variable-rate demand bonds outstanding (excluding commercial paper) with either a daily or weekly interest rate reset, as noted in the bonds and notes payable table on page 33. In the event that the University receives notice of any optional tender on its variable-rate demand 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 general obligation to purchase the bonds tendered with cash on hand.

### Interest rate exchange agreements

In fiscal 2020, the University had in place one interest rate exchange agreement, used to manage the interest cost and risk associated with a portion of its outstanding debt.

The fair value of the interest rate exchange agreement was $(44.2) million and $(27.4) million as of June 30, 2020 and 2019, respectively and is recorded in "Securities lending and other liabilities associated with the investment portfolio" on the University's *Balance Sheets*.

## 11. EMPLOYEE BENEFITS

The University offers current employees a choice of health plans, a dental plan, short-term and long-term disability plans, life insurance, tuition assistance, and a variety of other benefits such as subsidized passes for public transportation and for Harvard athletic facilities. In addition, the University has retirement plans covering substantially all employees.

The University uses a measurement date of June 30 for its pension and postretirement health plans.

### 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 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 $163.6 million as of June 30, 2020 and $151.2 million as of June 30, 2019; the assets are included in "Prepayments and deferred charges" and the liabilities are included in "Deferred revenue and other liabilities" on the University's *Balance Sheets*.

## Pension benefits

All eligible faculty members and staff are covered by retirement programs that include a defined benefit component, a defined contribution component, or a combination of the two.

In accordance with the Employee Retirement Income Security Act (ERISA) requirements, the University has established a trust to hold plan assets for its defined benefit pension plans. The fair value of the trust's assets was $959.4 million and $863.5 million as of June 30, 2020 and 2019, respectively. During fiscal years 2020 and 2019, the University made cash contributions to the defined benefit pension plan of $53.5 million and $14.9 million, respectively. The University recorded expenses for its defined contribution plans of $153.4 million and $148.5 million for fiscal year 2020 and 2019, respectively.

## Postretirement health benefits

The University provides postretirement health coverage and life insurance to substantially all of its employees. As of June 30, 2020, the University had internally designated and invested $779.8 million in the GIA to fund the postretirement health benefit accrued liability of $955.6 million. As of June 30, 2019, the University had internally designated and invested $727.9 million to fund the postretirement health benefit accrued liability of $854.6 million.

The following table sets forth the pension and postretirement plans' funded status that is reported in the *Balance Sheets* as of June 30, 2020 and 2019 (in thousands of dollars):

| | Pension benefits | | Postretirement health benefits | |
|---|---|---|---|---|
| | 2020 | 2019 | 2020 | 2019 |
| Change in projected benefit obligation: | | | | |
| Projected benefit obligation, beginning of year | **$ 1,129,397** | $ 1,004,962 | **$ 854,639** | $ 806,714 |
| Service cost | **11,926** | 9,675 | **31,880** | 30,474 |
| Interest cost | **40,625** | 42,455 | **31,529** | 34,719 |
| Plan participants' contributions | | | **4,222** | 3,761 |
| Plan change | | | **(10,339)** | 71 |
| Gross benefits paid | **(45,090)** | (51,817) | **(21,479)** | (28,509) |
| Actuarial (gain)/loss | **42,471** | 124,122 | **65,119** | 7,409 |
| Special termination benefits[3] | **40,765** | | | |
| **PROJECTED BENEFIT OBLIGATION, END OF YEAR**[1] | **1,220,094** | **1,129,397** | **955,571** | **854,639** |
| Change in plan assets: | | | | |
| Fair value of plan assets, beginning of year | **863,492** | 828,124 | | |
| Actual return on plan assets | **87,479** | 72,320 | | |
| Employer contributions | **53,533** | 14,865 | **17,257** | 24,748 |
| Plan participants' contributions | | | **4,222** | 3,761 |
| Gross benefits paid | **(45,090)** | (51,817) | **(21,479)** | (28,509) |
| **FAIR VALUE OF PLAN ASSETS, END OF YEAR** | **959,414** | **863,492** | **0** | **0** |
| **UNFUNDED STATUS**[2] | **$ (260,680)** | **$ (265,905)** | **$ (955,571)** | **$ (854,639)** |

[1] *Measurement of the University's pension obligation including assumed salary increases (required by GAAP).*
[2] *These amounts totaling $1,216,251 as of June 30, 2020 and $1,120,544 as of June 30, 2019 are included in the "Accrued Retirement Obligations" line in the* Balance Sheets.
[3] *Represents costs associated with a voluntary early retirement program offered to plan participants during fiscal 2020.*

The accumulated pension benefit obligation (ABO) is a measurement of the University's pension benefit obligation, based on past and present compensation levels and does not include assumed salary increases. The ABO was $1,011.7 million and $968.9 million at June 30, 2020 and 2019, respectively. The funded status disclosed above has been prepared in accordance with pension accounting rules. When measured on an IRS funding basis, which informs the University's required cash contribution amount, the plan was overfunded at January 1, 2020.

## Net periodic benefit cost

Components of net periodic benefit cost and other amounts recognized in the *Statements of Changes in Net Assets with General Operating Account Detail* are summarized as follows for the years ended June 30, 2020 and 2019 (in thousands of dollars):

| | Pension benefits | | Postretirement health benefits | |
|---|---|---|---|---|
| | 2020 | 2019 | 2020 | 2019 |
| Components of net periodic benefit cost: | | | | |
| Operating | | | | |
| Service cost | **$ 11,926** | $ 9,675 | **$ 31,880** | $ 30,474 |
| Special termination benefits | **40,765** | | | |
| Total operating activity | **52,691** | 9,675 | **31,880** | 30,474 |
| Non-operating | | | | |
| Interest cost | **40,625** | 42,455 | **31,529** | 34,719 |
| Expected return on plan assets | **(44,856)** | (50,469) | | |
| Amortization of: | | | | |
| Actuarial loss/(gain) | **15,682** | 3,320 | **(11,189)** | (13,469) |
| Prior service cost/(credit) | **288** | 288 | **(7,126)** | (7,132) |
| Total non-operating activity[1] | **11,739** | (4,406) | **13,214** | 14,118 |
| Total net periodic benefit cost | **64,430** | **5,269** | **45,094** | **44,592** |
| Other amounts recognized in non-operating activity in unrestricted net assets: | | | | |
| Current year net actuarial loss/(gain) | **(151)** | 102,271 | **65,119** | 7,409 |
| Current year net prior service cost | | | **(10,339)** | 71 |
| Amortization of: | | | | |
| Prior service (cost)/credit | **(288)** | (288) | **7,126** | 7,132 |
| Actuarial (loss)/gain | **(15,682)** | (3,320) | **11,189** | 13,469 |
| Total other amounts recognized in non-operating activity[1] | **(16,121)** | **98,663** | **73,095** | **28,081** |
| **TOTAL RECOGNIZED IN *STATEMENTS OF CHANGES IN NET ASSETS WITH GENERAL OPERATING ACCOUNT DETAIL*** | **$ 48,309** | **$ 103,932** | **$ 118,189** | **$ 72,673** |

[1] *These amounts totaling $81,927 in fiscal year 2020 and $136,456 in fiscal year 2019 include gains and losses and other changes in the actuarially determined benefit obligations arising in the current period but that have not yet been reflected within net periodic benefit cost/(income) and are included in the "Change in Retirement Obligations" line in the* Statements of Changes in Net Assets with General Operating Account Detail.

Cumulative amounts recognized as non-operating changes in net assets without donor restrictions are summarized as follows for the years ended June 30, 2020 and 2019 (in thousands of dollars):

| | Pension benefits | | Postretirement health benefits | |
|---|---|---|---|---|
| | 2020 | 2019 | 2020 | 2019 |
| Net actuarial loss/(gain) | **$ 180,814** | $ 196,647 | **$ (168,947)** | $ (245,254) |
| Prior service cost/(credit) | **894** | 1,181 | **(49,599)** | (46,386) |
| **CUMULATIVE AMOUNTS RECOGNIZED IN UNRESTRICTED NET ASSETS** | **$ 181,708** | **$ 197,828** | **$ (218,546)** | **$ (291,640)** |

The estimated net actuarial loss and prior service cost for the defined benefit plan that will be amortized from net assets without donor restrictions into net periodic benefit (income)/cost in fiscal year 2021 are $16.2 million and $0.3 million, respectively. The estimated net actuarial gain and estimated prior service credit for the postretirement health benefit that will be amortized from net assets without donor restrictions into net periodic benefit (income)/cost in fiscal year 2021 are ($7.9) million and ($5.1) million, respectively.

Other assumptions and health care cost trend rates used in determining the year end obligation as well as the net periodic benefit (income)/cost of the pension and postretirement health plans are summarized as follows for fiscal years 2020 and 2019:

| | Pension benefits | | Postretirement health benefits | |
|---|---|---|---|---|
| | 2020 | 2019 | 2020 | 2019 |
| Weighted-average assumptions used to determine benefit obligation as of June 30: | | | | |
| Discount rate | **3.15%** | 3.65% | **3.35%** | 3.60% |
| Compensation increase trend: | | | | |
| Average rate | **3.50%** | 3.50% | **3.50%** | 3.50% |
| Cash balance (or similar formula) interest crediting rate | **5.25%** | 5.25% | N/A | N/A |
| Pension increases for in-payment benefits increase trend: | | | | |
| Average rate | N/A | 0.15% | N/A | N/A |
| Initial rate | **0.00%** | N/A | N/A | N/A |
| Ultimate rate | **0.25%** | N/A | N/A | N/A |
| Year of ultimate | **2025** | N/A | N/A | N/A |
| Health care cost trend rate: | | | | |
| Current rate | N/A | N/A | **6.50%** | 5.00% |
| Ultimate rate | N/A | N/A | **4.75%** | 4.75% |
| Year of ultimate | N/A | N/A | **2025** | 2023 |
| Weighted-average assumptions used to determine net periodic benefit (income)/cost: | | | | |
| Discount rate | **3.65%** | 4.30% | **3.60%** | 4.20% |
| Expected long-term rate of return on plan assets | **5.50%** | 6.50% | N/A | N/A |
| Compensation increase trend: | | | | |
| Average rate | **3.50%** | N/A | **3.50%** | N/A |
| Initial rate | N/A | 3.00% | N/A | 3.00% |
| Ultimate rate | N/A | 4.00% | N/A | 4.00% |
| Year of ultimate | N/A | 2021 | N/A | 2021 |
| Pension increases for in-payment benefits increase trend: | | | | |
| Average rate | **0.15%** | 0.15% | N/A | N/A |
| Health care cost trend rate: | | | | |
| Initial rate | N/A | N/A | **5.00%** | 5.00% |
| Ultimate rate | N/A | N/A | **4.75%** | 4.75% |
| Year of ultimate | N/A | N/A | **2023** | 2023 |

As an indicator of sensitivity, a one percentage point change in assumed health care cost trend rate would affect 2020 as shown in the following table (in thousands of dollars):

| | 1% point increase | 1% point decrease |
|---|---|---|
| Effect on 2020 postretirement health benefits service and interest cost | $ 17,082 | $ (11,066) |
| Effect on postretirement health benefits obligation as of June 30, 2020 | 188,143 | (217,621) |

The expected return on pension plan assets is determined by utilizing an independent advisor's capital markets model, which takes into account the expected real return, before inflation, for each of the pension portfolio's asset classes, as well as the correlation of any one asset class to every other asset class. This model calculates the real returns and correlations and derives an expected real return for the entire portfolio, given the percentage weighting allocated to each asset class. After calculating the expected real return, an assessment is made to accommodate the expected inflation rate for the forthcoming period. The final expected return on assets is the aggregate of the expected real return plus the expected inflation rate.

## Plan assets

The actual asset allocation of the investment portfolio for the pension plan at June 30, 2020 and 2019, along with target allocations for June 30, 2021, is as follows:

| | 2021 Target | June 30, 2020 | June 30, 2019 |
|---|---|---|---|
| Asset allocation by category for pension plan: | | | |
| Equity securities | 30-55% | 36.2% | 38.7% |
| Fixed income securities | 40-60% | 59.0 | 47.1 |
| Real estate | 0-5 | 0.0 | 0.0 |
| Hedge funds | 0-5 | 3.3 | 12.5 |
| Cash | 0-5 | 1.5 | 1.7 |
| **TOTAL OF ASSET ALLOCATION CATEGORIES** | | **100.0%** | **100.0%** |

The University's investment strategy for the pension portfolio is to manage the assets across a broad and diversified range of investment categories, both domestic and international. The objective is to achieve a risk-adjusted return that is in line with the long-term obligations that the University has to the pension plan beneficiaries. During fiscal year 2020, the University increased its allocation to fixed income securities to manage the interest rate volatility associated with its pension obligations. The University expects to keep this strategy in future years. The investment program is also managed to comply with all ERISA regulations.

The following is a summary of the levels within the fair value hierarchy for the pension plan assets subject to fair value measurement as of June 30, 2020 and 2019 (in thousands of dollars):

| | 2020 | | | | | 2019 |
|---|---|---|---|---|---|---|
| | Level 1 | Level 2 | Level 3 | NAV as practical expedient | Total | Total |
| **PLAN ASSETS:** | | | | | | |
| Cash and short-term investments | $ 25,541 | | | | **$ 25,541** | $ 26,135 |
| Domestic equity | | | | $ 182,940 | **182,940** | 163,500 |
| Foreign equity | 70,147 | | | 29,771 | **99,918** | 107,557 |
| Domestic fixed income | 10,602 | $ 244,847 | | 286,732 | **542,181** | 368,338 |
| Foreign fixed income | | 16,213 | | | **16,213** | 22,555 |
| Emerging market equity and debt | 31,797 | | | 25,787 | **57,584** | 61,785 |
| Hedge funds | | | | 30,700 | **30,700** | 108,398 |
| Due from brokers | 67 | | | | **67** | 4 |
| Buy-sell backs | | | | | **0** | 33,343 |
| Private equity | | | | 2,184 | **2,184** | 4,234 |
| Real estate | | | | | **0** | 27 |
| **PLAN ASSETS SUBJECT TO FAIR VALUE LEVELING** | **$ 138,154** | **$ 261,060** | **$ 0** | **$ 558,114** | **$ 957,328** | **$ 895,876** |
| Other assets not subject to fair value | | | | | **2,086** | 1,085 |
| **TOTAL PLAN ASSETS** | | | | | **$ 959,414** | **$ 896,961** |
| **PLAN LIABILITIES:** | | | | | | |
| Due to brokers | | | | | **$ 0** | $ 49 |
| Forward sale commitment | | | | | **0** | 19,806 |
| **PLAN LIABILITIES SUBJECT TO FAIR VALUE LEVELING** | **$ 0** | **$ 0** | **$ 0** | | **$ 0** | **$ 19,855** |
| Other liabilities not subject to fair value | | | | | | 13,615 |
| **TOTAL PLAN LIABILITIES** | | | | | **$ 0** | **$ 33,470** |

### Expected future benefit payments

Employer contributions of $20.0 million are expected for fiscal year 2021 to fund the pension benefit plan.

The following table summarizes expected benefit payments and subsidies for pension and other postretirement health benefits for the University (in thousands of dollars):

| | Expected benefit payments | |
|---|---|---|
| Fiscal year | Pension | Postretirement health |
| 2021 | $ 56,533 | $ 23,318 |
| 2022 | 58,473 | 25,648 |
| 2023 | 60,584 | 27,891 |
| 2024 | 62,708 | 30,142 |
| 2025 | 64,608 | 32,337 |
| Thereafter | 347,213 | 195,546 |

## 12. STUDENT FINANCIAL AID

Financial aid granted to students in fiscal 2020 and 2019 is summarized as follows (in thousands of dollars):

| | 2020 | 2019 |
|---|---|---|
| Scholarships and other student awards: | | |
| Scholarships applied to student income[1] | **$ 480,989** | $ 457,369 |
| Scholarships and other student awards paid directly to students | **163,618** | 155,874 |
| Total scholarships and other student awards | **644,607** | **613,243** |
| Student employment | **81,922** | 81,287 |
| Student loans | **14,765** | 14,639 |
| Agency financial aid[2] | **19,839** | 20,326 |
| **TOTAL STUDENT FINANCIAL AID** | **$ 761,133** | **$ 729,495** |

[1] *Includes $202,221 and $192,712 in fiscal 2020 and 2019, respectively, of undergraduate scholarships applied to student income.*
[2] *Represents aid from sponsors for which the University acts as an agent for the recipient.*

## 13. SPONSORED SUPPORT

Total expenditures funded by US government sponsors or by institutions that subcontract federally-sponsored projects to the University were $616.2 million and $630.8 million in fiscal year 2020 and 2019, respectively. The University's principal source of federally-sponsored funds is the Department of Health and Human Services. The University also has many non-federal sources of sponsored awards and grants, including corporations, foundations, state and local governments, foreign governments, and research institutes.

Sponsored grants and contracts normally provide for the recovery of direct and indirect costs. Recovery of related indirect costs is generally recorded at fixed or predetermined rates negotiated with the federal government and other sponsors. Predetermined federal indirect cost rates have been established for the University Area and the Medical School (including the School of Dental Medicine) through fiscal year 2024 and for the T.H. Chan School of Public Health through fiscal year 2023. Funds received for federally-sponsored activity are subject to audit.

## 14. GIFTS

Gifts are classified as net assets with or without restrictions in accordance with donor specifications.

Additionally gifts are categorized by purpose as "Current use", "Non-federal sponsored grants", "Endowment funds", "Split interest agreements", or "Loan funds and facilities".

Gifts received for the year ended June 30, 2020 are as follows (in thousands of dollars):

| | 2020 | | |
|---|---|---|---|
| | Gifts received | Donor redesignations/ other changes | Total |
| Current use | $ 483,673 | $ (6,109) | **$ 477,564** |
| Non-federal sponsored grants | 206,394 | (3,767) | **202,627** |
| Endowment funds | 463,743 | 5,460 | **469,203** |
| Split interest agreements[1] | 9,709 | 0 | **9,709** |
| Loan funds and facilities | 51,241 | 207 | **51,448** |
| **TOTAL GIFTS** | **$ 1,214,760** | **$ (4,209)** | **$ 1,210,551** |

[1] *Shown at net present value. The undiscounted value of these gifts was $27,237 for the year ended June 30, 2020.*

Gifts received for the year ended June 30, 2019 are as follows (in thousands of dollars):

| | 2019 | | |
|---|---|---|---|
| | Gifts received | Donor redesignations/ other changes | Total |
| Current use | $ 472,432 | $ (319) | **$ 472,113** |
| Non-federal sponsored grants | 197,236 | (778) | **196,458** |
| Endowment funds | 614,561 | (1,274) | **613,287** |
| Split interest agreements[1] | 8,437 | 0 | **8,437** |
| Loan funds and facilities | 85,744 | 628 | **86,372** |
| **TOTAL GIFTS** | **$ 1,378,410** | **$ (1,743)** | **$ 1,376,667** |

[1] *Shown at net present value. The undiscounted value of these gifts was $18,508 for the year ended June 30, 2019.*

## 15. OTHER REVENUE

The major components of other revenue for the years ended June 30, 2020 and 2019 were as follows (in thousands of dollars):

| | 2020 | 2019 |
|---|---|---|
| Publications and royalties from copyrights | **$ 239,002** | $ 238,385 |
| Rental and parking[1] | **125,573** | 141,375 |
| Services income | **114,410** | 136,288 |
| Health and clinic fees | **68,813** | 64,780 |
| Royalties from the commercialization of intellectual property[2] | **61,947** | 97,568 |
| Sales income | **28,460** | 29,888 |
| Interest income | **9,364** | 10,961 |
| Other student income | **4,215** | 5,112 |
| Other | **47,570** | 47,681 |
| **TOTAL OTHER REVENUE** | **$ 699,354** | **$ 772,038** |

[1] *The University is the lessor of space and facilities under operating leases, the income from which is included in rental and parking.*
[2] *Excludes distributions to external parties.*

## 16. OTHER EXPENSES

The major components of other expenses for the years ended June 30, 2020 and 2019 were as follows (in thousands of dollars):

| | 2020 | 2019 |
|---|---|---|
| Fixed asset impairments | **$ 182,435** | $ 40,741 |
| Subcontract expenses under sponsored projects | **152,916** | 158,543 |
| Travel | **71,080** | 103,697 |
| Publishing | **45,164** | 46,951 |
| Taxes and Fees | **31,597** | 43,199 |
| Advertising | **38,022** | 38,568 |
| Insurance | **17,176** | 18,617 |
| Postage | **14,765** | 17,398 |
| Telephone | **12,783** | 14,663 |
| Other | **64,959** | 75,424 |
| **TOTAL OTHER EXPENSES** | **$ 630,897** | **$ 557,801** |

## 17. FUNCTIONAL AND NATURAL CLASSIFICATION OF OPERATING EXPENSES

Operating expenses are allocated functionally on a direct basis. Operations and maintenance expenses are allocated based on square footage.

Operating expenses by functional classification for the years ended June 30, 2020 and 2019 were as follows (in thousands of dollars):

| | 2020 | | | | |
|---|---|---|---|---|---|
| | Instruction and academic support | Research[1] | Student services and support | Institutional support and auxiliary | Total |
| Salaries and wages | $ 1,090,715 | $ 304,443 | $ 148,043 | $ 588,310 | $ 2,131,511 |
| Employee benefits | 287,492 | 76,702 | 52,259 | 204,299 | 620,752 |
| Services purchased | 350,815 | 86,969 | 56,722 | 175,979 | 670,485 |
| Space and occupancy | 103,658 | 59,117 | 30,645 | 170,743 | 364,163 |
| Depreciation | 46,454 | 117,990 | 17,351 | 195,060 | 376,855 |
| Supplies and Equipment | 82,003 | 49,274 | 39,975 | 72,618 | 243,870 |
| Interest | 16,908 | 30,380 | 12,503 | 120,936 | 180,727 |
| Scholarships and other student awards | | | 163,618 | | 163,618 |
| Other expense | 21,252 | 399,932 | 25,281 | 184,432 | 630,897 |
| **TOTAL EXPENSES** | **$ 1,999,297** | **$ 1,124,807** | **$ 546,397** | **$ 1,712,377** | **$ 5,382,878** |

[1] *The methodology used to allocate expenses for financial statement purposes is different than methodologies used for other purposes, such as governmental surveys.*

| | 2019 | | | | |
|---|---|---|---|---|---|
| | Instruction and academic support | Research[1] | Student services and scholarships | Institutional support and auxiliary services | Total |
| Salaries and wages | $ 1,043,852 | $ 294,285 | $ 141,588 | $ 558,753 | **$ 2,038,478** |
| Employee benefits | 268,689 | 73,583 | 49,577 | 163,944 | **555,793** |
| Services purchased | 363,109 | 85,599 | 60,311 | 171,672 | **680,691** |
| Space and occupancy | 113,374 | 59,349 | 30,083 | 176,484 | **379,290** |
| Depreciation | 43,817 | 119,333 | 19,985 | 199,640 | **382,775** |
| Supplies and equipment | 84,587 | 57,428 | 43,222 | 85,386 | **270,623** |
| Interest | 15,201 | 33,081 | 11,890 | 121,461 | **181,633** |
| Scholarships and other student awards | | | 155,874 | | **155,874** |
| Other expense | 36,229 | 414,717 | 35,030 | 71,825 | **557,801** |
| **TOTAL EXPENSES** | **$ 1,968,858** | **$ 1,137,375** | **$ 547,560** | **$ 1,549,165** | **$ 5,202,958** |

[1] *The methodology used to allocate expenses for financial statement purposes is different than methodologies used for other purposes, such as governmental surveys.*

## 18. COMMITMENTS AND CONTINGENCIES

### Lease commitments

The University is the lessee of equipment and space under operating (rental) and finance leases. The University determines whether a contract is a lease at inception. Identified leases are subsequently measured, classified, and recognized at lease commencement. The University categorizes leases with contractual terms longer than twelve months as either operating or finance. The University's leases generally have terms that range from one to five years for equipment and one to twenty years for property, with certain leases inclusive of renewal options if they are considered to be reasonably assured at lease commencement. Right of use assets and lease liabilities for operating leases are included in "Operating leases—right of use assets" and "Operating lease liabilities", respectively, in the *Balance Sheets*. Finance lease right of use assets and lease liabilities are included in "Fixed assets" and "Deferred revenue and other liabilities", respectively, in the *Balance Sheets*. Lease assets represent our right to use an underlying asset for the lease term and lease liabilities represent our obligation to make lease payments arising from the lease.

Operating and finance lease right of use assets and associated lease liabilities are recognized based on the present value of future minimum lease payments to be made over the expected lease term, using the collateralized incremental borrowing rate at the commencement date in determining the present value of future payments. Rent expense related to operating leases, including short-term leases and variable lease payments, was $93.9 million and $105.4 million in fiscal year 2020 and 2019, respectively.

Maturity analysis of the annual undiscounted cash flows reconciled to the carrying value of the operating and finance lease liabilities (in thousands of dollars):

| | Operating | Finance |
|---|---|---|
| 2021 | $ 82,278 | $ 13,248 |
| 2022 | 80,697 | 13,519 |
| 2023 | 77,596 | 13,580 |
| 2024 | 73,845 | 11,195 |
| 2025 | 68,156 | 11,585 |
| Thereafter | 564,388 | 125,635 |
| **TOTAL LEASE PAYMENTS** | 946,960 | 188,762 |
| Less: Imputed Interest | (179,361) | (83,875) |
| **PRESENT VALUE OF LEASE LIABILITIES** | **$ 767,599** | **$ 104,887** |

Weighted-average remaining lease term and discount rate for operating and finance leases were as follows:

| | June 30, 2020 |
|---|---|
| Weighted Average Remaining Lease Term | |
| Operating Leases | 16.1 YEARS |
| Finance Leases | 15.2 YEARS |
| Weighted Average Discount Rate | |
| Operating Leases | 2.5% |
| Finance Leases | 2.4% |

The University leases properties to customers under agreements that are classified as operating leases. The University's lessor arrangements are all operating leases and do not include any sales-type or direct finance leases. Property leased to others are included in "Fixed assets" in the *Balance Sheets*. Revenue is recognized to the extent that amounts are determined to be collectible.

## Fixed asset-related commitments

The University has various commitments for capital projects involving construction and renovation of certain facilities, real estate acquisitions, and equipment purchases, for which the outstanding commitments as of June 30, 2020 totaled approximately $281.5 million.

## Environmental remediation

The University is subject to laws and regulations concerning environmental remediation and has established reserves for potential obligations that management considers to be probable and for which reasonable estimates can be made. These estimates may change substantially depending on new information regarding the nature and extent of contamination, appropriate remediation technologies, and regulatory approvals. Costs of future environmental remediation have been discounted to their net present value. Management is not aware of any existing conditions that it believes are likely to have a material adverse effect on the University's financial position, changes in net assets, or cash flows.

## General

The University is a defendant in various legal actions arising from the normal course of its operations. While it is not possible to predict accurately or determine the eventual outcome of such actions, management believes that the outcome of these proceedings will not have a material adverse effect on the University's financial position, changes in net assets, or cash flows.

The University has evaluated subsequent events through October 22, 2020, the date the financial statements were issued. The University has concluded that no material events have occurred that are not accounted for in the accompanying financial statements or disclosed in the accompanying notes.

# Schedule of Expenditures of Federal Awards

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| **Reseach and Development Cluster (R&D)** | | | | | |
| **Direct Awards** | | | | | |
| **Department of Agriculture** | | | | | |
| Synergistic impacts of pesticide exposure and temperature stress in bumblebees | 10.310 | 2019-67012-29666 | | 65,166 | - |
| **Total for CFDA 10.310** | | | | 65,166 | - |
| Past and future land use / land cover change within watersheds of the upper Great Lakes | 10.RD | 19-CR-11242313-123 | | 18,471 | - |
| Transects across New England landscapes: Investigating historical disturbances, vegetation dynamics, and functional changes in forest ecosystems | 10.RD | 17-JV-11242306-038 | | 19,530 | - |
| **Total for CFDA 10.RD** | | | | 38,001 | - |
| **Total for Department of Agriculture Direct Awards** | | | | 103,167 | - |
| **Department of Commerce** | | | | | |
| CO2 Urban Synthesis and Analysis (CO2-USA) Network | 11.431 | NA17OAR4310086 | | 44,968 | - |
| Data assimilation to leverage diverse datasets for improved CO2 and CH4 flux estimation and future observing system design | 11.431 | NA19OAR4310173 | | 28,977 | - |
| Long-term trends of tropospheric ozone constrained by global observation networks and GEOS-Chem | 11.431 | NA19OAR4310176 | | 17,996 | - |
| Maritime Continent as a barrier to the MJO propagation: an analysis of the sensitivity of convection to column moisture | 11.431 | NA17OAR4310260 | | 88,177 | - |
| **Total for CFDA 11.431** | | | | 180,118 | - |
| Dissertation Proposal: The US Productivity Slowdown | 11.RD | 1333LB19P00000174P20001 | | 49,814 | - |
| **Total for 11.RD** | | | | 49,814 | - |
| **Total for Department of Commerce Direct Awards** | | | | 229,932 | - |
| **Department of Defense** | | | | | |
| Adaptive Choice Set Construction for Complex Decision Making | 12.300 | N00014-19-1-2025 | | 157,305 | - |
| An acoustic liquid handling robot for combinatorial assembly of large DNA nanostructures | 12.300 | N00014-19-1-2345 | | 365,255 | - |
| Analysis of high dimensional Gibbs samplers and Bayesian modeling of climate data | 12.300 | N00014-18-1-2730 | | 193,206 | - |
| Bio-Electrical Energy from Seafloor Methane Sources | 12.300 | N00014-19-1-2244 | | 234,749 | - |
| Biophysiokinetic effect of NIR on cochlear oxidative stress and TTS | 12.300 | N00014-16-1-2966 | | 487,279 | - |
| Chemistry of Seawater Electrolysis and Byproduct Management for Underwater Breathing | 12.300 | N00014-19-1-2385 | | 281,924 | - |
| Confirmatory GWAS Analysis of the Samples in the Marine Recruit Archive | 12.300 | N00014-15-1-2518 | | 2 | - |
| DNA-based technologies for reading and writing large-scale molecular patterns with nanoscale-precision | 12.300 | N00014-18-1-2549 | | 476,514 | - |
| Embedded Deep Learning and Advanced Computation | 12.300 | FA8750-18-1-0112 | | 227,237 | - |
| Fast Sparse Coding: A New Approach to Accelerate the Intelligence Cycle Computations | 12.300 | N00244-15-1-0050 | | (1,583) | - |
| Fluidic Powered Soft Fabric-Based Actuators for Wearable Robotic Applications | 12.300 | N00014-17-1-2121 | | 202,134 | - |
| High-Tc Superconductivity at Oxide-Chalcogenide Interfaces | 12.300 | N00014-18-1-2691 | | 207,752 | - |
| High-Throughput Growth of Interface Superconductors | 12.300 | N00014-19-1-2622 | | 249,600 | - |
| Many-Body Quantum Dynamics with Microscope Control- A New Research Frontier | 12.300 | N00014-18-1-2863 | | 776,582 | - |
| MicroRNA-mediated genomic stability and NIHL susceptibility | 12.300 | N00014-17-1-2647 | | 373,741 | - |
| Nanostructured Surfaces for Integrated Optoelectronics, Plasmonics, and Quantum Optics | 12.300 | N00014-16-1-2825 | | 433,725 | - |
| Next Generation Sequencing equipment for synthetic DNA analysis | 12.300 | N00014-19-1-2532 | | 90,882 | - |
| Next-Generation Materials for Oxygen Generation, Transport, and Storage in the Undersea Environment | 12.300 | N00014-20-1-2418 | | 43,569 | - |
| Oxygen Generation and Extraction from Seawater | 12.300 | N00014-18-1-2650 | | 88,636 | - |
| Porous Metal-Organic Liquids as a New Platform for Investigation Gas-Liquid Interactions | 12.300 | N00014-19-1-2148 | | 174,432 | - |
| Practical and Scalable Quantum Simulators for Chemistry and Materials | 12.300 | N00014-16-1-2008 | | 241,268 | - |
| Programmable Architected Materials | 12.300 | N00014-16-1-2823 | | 591,043 | - |
| Programmable synthesis of DNA nanostructures for spatial and temporal control | 12.300 | N00014-16-1-2410 | | 120,377 | - |
| Quantum Engineered van der Waals Heterostructures for Topological Electronic Structures toward Novel Device Applications | 12.300 | N00014-18-1-2877 | | 902,882 | - |
| Quantum Information Processing With Phonons | 12.300 | N00014-20-1-2425 | | 3,561 | - |
| Quantum Opto-Mechanics with Atoms and Nanostructured Diamond: QOMAND | 12.300 | N00014-15-1-2761 | | 1,303,413 | 927,144 |
| Quantum Sensing and Metrology: Novel Methods and Applications | 12.300 | N00014-15-1-2846 | | 217,244 | - |
| Quantum simulation: From spin models to gauge-gravity correspondence | 12.300 | N00014-18-1-2899 | | (9,752) | - |
| Real-time Distributed Coordination of Multi-agent Systems under Limited Communication | 12.300 | N00014-19-1-2217 | | 265,333 | - |
| Sketching methods for high-dimensional data analysis | 12.300 | N00014-17-1-2127 | | 6,147 | - |
| SLIPS Mechanisms and Design Principles for Marine Biofouling Prevention | 12.300 | N00014-17-1-2913 | | 9,835 | - |
| Soft Robotic Instructional Kits for Education and STEM Outreach | 12.300 | N00014-19-1-2386 | | 124,425 | - |
| Structured Reinforcement Learning in the Human Brain | 12.300 | N00014-17-1-2984 | | 236,292 | - |
| Synthetic Bioelectrical Materials for Sensing, Pattern Formation, and Computation | 12.300 | N00014-18-1-2859 | | 312,446 | - |
| Towards Living Materials using Synthetic Building blocks | 12.300 | N00014-17-1-3029 | | 659,901 | - |
| TwoRavens:  Intuitive Statistical Exploration, Model Extraction, and Curation | 12.300 | FA8750-17-2-0114 | | 448,721 | 72,372 |
| **Total for CFDA 12.300** | | | | 10,496,077 | 999,516 |
| Paper diagnostics for food- and waterborne pathogen detection | 12.335 | W911QY1910001 | | 55,781 | - |
| **Total for CFDA 12.335** | | | | 55,781 | - |
| A prospective study of serum levels of polyunsaturated fatty acids and effects on multiple sclerosis disease activity and progression | 12.420 | W81XWH1910155 | | 219,519 | - |
| An evolutionary approach to vulnerability mapping in order identify alternative and synergistic therapeutic strategies for TSC and related diseases | 12.420 | W81XWH1810659 | | 272,077 | - |
| Anticoagulant Vascular Shunts for Temporary Arterial Bypass | 12.420 | W81XWH-17-2-0028 | | 555,277 | 79,788 |
| Chemigenomic Drug Discovery for Tuberculosis | 12.420 | W81XWH-17-1-0692 | | 2,155,119 | 1,791,183 |
| Evaluation of a Small-Molecule Inhibitor of DDR2 as a Drug in Treatment of Osteoarthritis | 12.420 | W81XWH1810097 | | 118,526 | - |
| Genes, environment, and Prodromal features of Parkinson disease | 12.420 | W81XWH-20-1-0303 | | 19,833 | - |
| Gut Symbiotic Lipid A Family: Structures and Immunomodulation in IBD | 12.420 | W81XWH1910625 | | 526,828 | - |
| Identification of Premotor Parkinson disease | 12.420 | W81XWH-14-1-0131 | | 25,300 | 21,571 |
| Mapping the routes to tumor cell death in TSC | 12.420 | W81XWH-18-1-0370 | | 185,096 | - |
| Posttraumatic Stress Disorder and Ovarian Cancer Risk | 12.420 | W81XWH-17-1-0153 | | 180,568 | 24,588 |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Preclinical Evaluation of BCL2/BCLXL Inhibition to Enhance the Efficacy of Antibody-Drug Conjugates (ADCs) for the Treatment of Distinct Breast Cancer Subtypes | 12.420 | W81XWH-16-1-0340 | | 4,405 | - |
| The longitudinal impact of treatment on cognitive function in men with advanced prostate cancer | 12.420 | W81XWH1910412 | | 47,671 | - |
| Theranostic Cellular Backpacks for Precision Imaging and Treatment of Traumatic Brain Injury Sites | 12.420 | W81XWH1920011 | | 1,030,712 | - |
| Understanding the role of gene-environment interactions in the degeneration of human dopaminergic neurons in Parkinson's Disease | 12.420 | W81XWH1910696 | | 174,511 | - |
| **Total for CFDA 12.420** | | | | 5,515,442 | 1,917,130 |
| A Cell-Type Specific Platform for Identifying Toxicity of Proteins and Polypeptides | 12.431 | W911NF-17-2-0089 | | 653,748 | 357,561 |
| A Quantum Gas Microscope for Extended Fermi-Hubbard Models | 12.431 | W911NF1810182 | | (4,942) | - |
| Aggregation in Foreign Policy Decision-Making | 12.431 | W911NF1920162 | | 307,357 | - |
| An Automated Scientific Discovery Framework (ASDF) for Mechanistic Reasoning Across Complex Data | 12.431 | W911NF-18-1-0124 | | 625,784 | 212,918 |
| Continuation Study: A Systems Approach to Understanding Post-Traumatic Stress Disorder | 12.431 | W911NF-17-2-0086 | | 440,247 | 162,833 |
| Design of Cellular Blocks, their Programmatic Assembly into Biological Meshes, and the Synthesis of Tissue-Like Structures | 12.431 | W911NF-17-2-0079 | | 148,869 | - |
| Exploring New Approaches for Coupling Spin Qubits | 12.431 | W911NF-15-1-0203 | | 103,067 | - |
| Facility For the Development and Characterization of New High-Performance Submillimeter Wave Lasers | 12.431 | W911NF2010157 | | 16,507 | - |
| Hydrodynamic Electron Transport in 2-Dimensional Materials for Nanoelectronics | 12.431 | W911NF-17-1-0574 | | 133,204 | 27,090 |
| Imaging and Control of Biological Transduction using NV-DIamond | 12.431 | W911NF-15-1-0548 | | 785,997 | 486,560 |
| Integrated Human Organ-on-Chip Microphysiological Systems | 12.431 | W911NF-12-2-0036 | | 732,040 | - |
| Oxidative decomposition of chemical agent simulants using atomically dispersed metal centers on oxides | 12.431 | W911NF1820143 | | 115,981 | 41,020 |
| Quantum Nanophotonics with Lithium Niobate | 12.431 | W911NF2010248 | | 5,342 | - |
| Quantum Optimization with Programmable Simulators based on Atom Arrays | 12.431 | W911NF2010021 | | 223,272 | - |
| Quantum Sensing of Quantum Materials | 12.431 | W911NF-17-1-0023 | | 199,537 | - |
| Quon Pictorial Language, Analysis, Quantum Information | 12.431 | W911NF1910302 | | 263,327 | - |
| Rapid Tests for Virus Genes that Suppress the Host Antiviral Defenses | 12.431 | W911NF-17-2-0092 | | 2,097,100 | 1,093,126 |
| Topological Superconductivity using Layered Materials | 12.431 | W911NF1810316 | | 191,066 | 127,932 |
| Toward Mathematical Intelligence and Certifiable Automated Reasoning: Theoretical Understanding and Experimental Realization | 12.431 | W911NF2010082 | | 73,686 | - |
| Widely-tunable, compact sub-millimeter source operating at room-temperature from 100 GHz to 1 THz | 12.431 | W911NF1920168 | | 163,675 | - |
| **Total for CFDA 12.431** | | | | 7,274,864 | 2,509,040 |
| Active Metasurfaces for Advanced Wavefront Engineering and Waveguiding | 12.800 | FA9550-14-1-0389 | | 700,746 | 560,580 |
| Chiral Nanophotonics | 12.800 | FA9550-16-1-0156 | | (7,038) | - |
| Cooperative radiation for Quantum information processing and metrology | 12.800 | FA9550-19-1-0233 | | 38,548 | - |
| Distributed Coordination in Multi-agent Networked Systems Algorithms and Fundamental Limits | 12.800 | FA9550-18-1-0150 | | 95,306 | - |
| Entangling ultracold molecules | 12.800 | FA9550-19-1-0089 | | 127,462 | - |
| Generating Multiple Hypotheses in Non-negative Matrix Factorization and Related Linear Models | 12.800 | FA9550-17-1-0155 | | 142,757 | - |
| High-index dielectric metasurfaces for enhanced magneto-optics | 12.800 | FA9550-19-1-0352 | | 221,746 | - |
| High-Performance Electro-Optic Frequency Combs for High-Precision Measurements | 12.800 | FA9550-19-1-0310 | | 66,769 | - |
| Injectable Mesh Nanoelectronics for Brain Mapping and Modulation | 12.800 | FA9550-18-1-0469 | | 281,836 | - |
| Laser Cooling of Complex Molecules for Quantum Science | 12.800 | FA9550-19-1-0068 | | 240,372 | - |
| Laser Cooling of Polyatomic Molecules | 12.800 | FA9550-15-1-0446 | | 60 | - |
| Metasurface Polarization Optics and Imaging | 12.800 | FA9550-19-1-0135 | | 188,054 | - |
| Modulating Cellular Performance with Nanoscale Biocircuits | 12.800 | FA9550-19-1-0246 | | 270,366 | - |
| Nanoelectronics Innervated Cells, Cell Networks and Three-Dimensional Biomaterials | 12.800 | FA9550-14-1-0136 | | 29 | - |
| Nanostructured Optics for High-Power Laser Applications | 12.800 | FA9550-19-1-0376 | | 100,536 | - |
| Optical Magnetic Imaging of Neuronal Currents and Impedance using Quantum Defects in Diamond | 12.800 | FA9550-17-1-0371 | | 101,943 | - |
| The Production and Study of Antiprotons and Cold Antihydrogen | 12.800 | FA9550-15-1-0275 | | 306,049 | 225,991 |
| Writing and Securing Peer-to-Peer Computation | 12.800 | FA9550-16-1-0351 | | 9,973 | - |
| **Total for CFDA 12.800** | | | | 2,885,514 | 786,571 |
| Active Context | 12.910 | W911NF-15-1-0544 | | 1,476,917 | 101,995 |
| DARPA Biological Control: A generalizable approach to engineer ultra-precise cellular control systems with applications to drug resistance | 12.910 | HR0011-16-2-0049 | | 1,425,420 | 156,249 |
| Deep Learning Architectures for Robust Classification Under Adversarial Noise | 12.910 | FA8650-18-1-7811 | | (12,362) | - |
| Design and Engineering of Biostasis Proteins | 12.910 | W911NF1920017 | | 2,701,063 | 709,437 |
| Diamond Based Magnetometry for Quantum Information Processing Using Endohedral Fullerenes | 12.910 | HR0011-09-1-0005 | | (142,778) | - |
| Diamond Micro-Combs and Applications | 12.910 | W31P4Q-15-1-0013 | | (16,506) | (15,873) |
| High-efficiency aberration corrected large metalenses | 12.910 | HR00111810001 | | 523,378 | - |
| Identifying pathogenic bacteria by phenotyping | 12.910 | W911NF-19-2-0018 | | 4,118,872 | 818,787 |
| Incentive alignment and lifelong learning in stochastic games. | 12.910 | W911NF1820265 | | 366,461 | - |
| Information Storage and Processing Using Time-Ordered Strings of Molbytes, and Molecular Processes | 12.910 | W911NF-18-2-0030 | | 1,197,304 | 164,541 |
| Mechanism Design for Resource Coordination in Dynamic, Multi-Actor Worlds | 12.910 | HR00111920029 | | 373,056 | - |
| Multiplexed Organism-Based Pathogen Detection | 12.910 | W911NF1920023 | | 245,135 | - |
| Rapid Tests for signatures of genetic engineering in biological samples | 12.910 | N660011824505 | | 316,844 | - |
| STOP PAIN: Safe Therapeutic Options for Pain and Inflammation | 12.910 | HR0011-19-2-0022 | | 2,688,027 | 1,065,368 |
| Surveillance of Passenger Organisms to Record Embarkment | 12.910 | HR0011-18-2-0014 | | 648,592 | 218,116 |
| Ultra-Rapid Drug Repurposing for COVID19 Therapeutics | 12.910 | HR0011-20-2-0040 | | 720,023 | - |
| **Total for CFDA 12.910** | | | | 16,629,446 | 3,218,620 |
| An Integrative Exploration of Actuation and Power Systems for Microrobots | 12.RD | HR001119C0044 | | 315,508 | - |
| Biologically Inspired Soft Smart Exosuit for Injury Prevention and Performance Augmentation | 12.RD | W911NF-14-C-0051 | | (2,318) | - |
| Evaluating the Importance of Precursor Transport and Transformation for Groundwater Contamination with Poly- and Perfluoroalkyl Substances | 12.RD | W912HQ19C0002 | | 476,365 | 87,818 |
| Integration of top-down and bottom-up methodologies for accurate modeling of biological networks | 12.RD | FA8750-17-C-0255 | | 520,859 | - |
| Reverse Engineering Host Resilience | 12.RD | W911NF-16-C-0050 | | 337,301 | 119,880 |
| Time-Tolerant Biostasis Therapeutics | 12.RD | W911NF1920027 | | 7,216,609 | 172,984 |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Metabolomic Predictors of MS Outcomes | 12.RD | W81XWH1810341 | | 79,687 | 7,430 |
| **Total for CFDA 12.RD** | | | | 8,944,011 | 388,112 |
| **Total for Department of Defense Direct Awards** | | | | 51,801,135 | 9,818,989 |
| **Department of Housing & Urban Development** | | | | | |
| First-Time Homeownership in Fringe Cities: A Case Study of Brockton MA | 14.506 | RP-19-MA-004 | | 207 | - |
| **Total for CFDA 14.506** | | | | 207 | - |
| Optimizing the Impact of Smoke-Free Residential Policies using an Evidence-Informed Implementation Approach | 14.906 | MAHHU0041-18 | | 299,442 | - |
| **Total for CFDA 14.906** | | | | 299,442 | - |
| **Total for Department of Housing & Urban Development Direct Awards** | | | | 299,649 | - |
| **Department of the Interior** | | | | | |
| Historic Resource Study: African-American Civil Rights Leaders and the Roosevelts | 15.946 | P14AC00888 | | 8,111 | - |
| **Total for CFDA 15.946** | | | | 8,111 | - |
| Algorithms for Representation and Inference informed by the Acquisition of Data from Neuroscience Experiments (ARIADNE) | 15.RD | D16PC00002 | | (53,373) | - |
| Cortical architecture and algorithms for machine listening | 15.RD | D16PC00008 | | (1) | - |
| **Total for 15.RD** | | | | (53,374) | - |
| **Total for Department of the Interior Direct Awards** | | | | (45,263) | - |
| **Department of Justice** | | | | | |
| Evaluation of the Peer to Peer (P2P): Challenging Extremism Initiative | 16.560 | 2016-ZA-BX-K001 | | 42,961 | - |
| The Final Stage Reentry Project: An RCT of Expungement and Its Effect on Recidivism, Housing, and Employment | 16.560 | 2019-RY-BX-0001 | | 269,001 | 128,016 |
| Using Public Health Datasets to Analyze Legal Intervention Shootings | 16.560 | 2016-R2-CX-0038 | | 16,336 | 16,336 |
| **Total for CFDA 16.560** | | | | 328,298 | 144,352 |
| **Total for Department of Justice Direct Awards** | | | | 328,298 | 144,352 |
| **NASA** | | | | | |
| A Comprehensive Search for X-ray Emission from the Coolest Magnetically Active Brown Dwarfs | 43.001 | GO8-19005X | | 10,416 | - |
| A comprehensive state-of-science GEOS-Chem capability for atmospheric chemistry in the GEOS Earth System Model (ESM) and Data Assimilation System (DAS) at GMAO | 43.001 | 80NSSC17K0134 | | 91,610 | - |
| A Full Characterisation of the Multiple Population Properties of Young Globular Clusters | 43.001 | HST-GO-15630.009-A | | 36,728 | - |
| A Homogeneous, Global Analysis of all Kepler and K2 Planets | 43.001 | 80NSSC19K1014 | | 93,167 | - |
| A Low-redshift Strong-lensing Elliptical Galaxy With a Bright Source: A Unique Test for IMF Gradients | 43.001 | HST-GO-15477.002-A | | 5,690 | - |
| Advancing Tidal Tomography for Study of Earth's Interior | 43.001 | NNX17AE42G | | 31,698 | - |
| An X-Ray Study of a Tidal Disruption Event in an AGN Host Galaxy | 43.001 | GO9-20097X | | 36,110 | - |
| Assessing the High-Energy Environment of the Habitable Zone Planet LHS 1140b | 43.001 | 80NSSC19K0861 | | 1,271 | - |
| Astro-comb Optical Wavelength Calibrator for Exoplanet Research | 43.001 | NNX09AC92G | | (48,171) | - |
| Atmospheric chemistry modeling on cloud computing platforms: development of a new resource for analysis of Earth science data | 43.001 | 80NSSC18K1334 | | 46,577 | - |
| Atmospheric Collapse and Volatile Transport on Rocky M-Star Planets | 43.001 | NNX16AR86G | | 83,822 | - |
| Atmospheric Tomography Mission (ATom): Imaging the Chemistry of the Global Atmosphere | 43.001 | NNX15AJ23G | | 209,100 | - |
| Aura Science Team activities and GEOS-Chem support | 43.001 | NNX17AI67G | | 365,499 | - |
| Ca, K, Nd and Mg isotopic heterogeneities in the Solar System | 43.001 | 80NSSC20K0346 | | 32,990 | - |
| Constraining the onset of multiple stellar populations in globular clusters | 43.001 | HST-HF2-51387.001-A | | 101,711 | - |
| Determining the explosion mechanism of a superluminous supernova through the deepest ever late-time study | 43.001 | HST-GO-14743.002-A | | 17,853 | - |
| Development and deployment of an Autonomous Biogeochemical Instrument for In Situ Studies (the ABISS) | 43.001 | NNX17AB31G | | 233,098 | 107,066 |
| Discovery and Atmospheric Reconnaissance of the Most Spectroscopically Accessible Temperate Transiting Terrestrial Exoplanets | 43.001 | 80NSSC18K0476 | | 23,372 | - |
| Dynamics and Chemistry of the Summer Stratosphere | 43.001 | 80NSSC19K0326 | | 2,038,671 | - |
| Estimating Total Ecosystem Carbon in Blue Carbon and Tropical Peatland Ecosystems: Coastal Mangrove and Wetland Extent Mapping | 43.001 | 80NSSC19K1002 | | 94,570 | - |
| Evolution of sub-cellular metabolism in photosynthetic eukaryotes: Isotopic investigation of the partitioning of nitrogen between chloroplasts and mitochondria | 43.001 | NNX16AJ52G | | 133,396 | 129,890 |
| Field Measurements of Atmospheric Trace Species: Airborne/Balloon in situ and Ground-Based Remote Sensing of CO2, CH4, CO, N2O, and C2H6 | 43.001 | NNX17AF54G | | 356,895 | - |
| Fine-Tuned Search for Kilonova Emission in a Short Gamma-Ray Burst: Implications for the Progenitors, Advanced LIGO, and r-Process Nucleosynthesis | 43.001 | HST-GO-15329.001-A | | 32,215 | - |
| FIRST X-RAY OBSERVATIONS OF A PECULIAR FLARING AGN OBSERVED BY KEPLER: A SUPERMASSIVE BLACK HOLE BINARY HYPOTHESIS | 43.001 | 80NSSC19K1392 | | 14,499 | - |
| Glacial Isostatic Adjustment in the Antarctic in the Presence of Complex Earth Structure: Applications to Space-Geodetic Measurements of Climate Change | 43.001 | NNX17AE17G | | 27,940 | - |
| HREXI prototype for 4piXIO | 43.001 | NNX17AE62G | | 394,730 | 10,158 |
| Imaging the transition of SN 1987A to SNR 1987A | 43.001 | HST-GO-15256.002-A | | 38,212 | - |
| Improved Understanding of Methane Emissions and Trends in North America and Globally Through a Unified Top-Down and Bottom-Up Approach Exploiting GOSAT and TROPOMI Satellite Data | 43.001 | 80NSSC18K0178 | | 204,292 | - |
| Improving terrestrial biosphere model predictions of coupled carbon, water, and energy fluxes using remotely sensed surface and vegetation temperatures | 43.001 | NNX16AO21H | | 10,757 | - |
| Isotopic and chemical consequences of different accretion scenarios: Comparing models with observations | 43.001 | NNX17AE27G | | 43,405 | 23,778 |
| Laboratory Kinetics and Spectroscopic Studies of Halogens and Nitrogen Oxides in Support of the NASA Panel for Data Evaluation | 43.001 | 80NSSC18K1063 | | 201,562 | - |
| Late-time Radio and X-ray Monitoring of the Relativistic TDE Sw 1644+57 | 43.001 | GO8-19098X | | 27,263 | - |
| Late-time X-ray and Radio Observations of the Unique Relativistic TDE Sw 1644+57 | 43.001 | GO8-19087X | | 32,204 | - |
| Legacy Light Curves of a Volume-Complete Sample of the Nearby Mid-To-Late M Dwarfs with Tess | 43.001 | 80NSSC19K1726 | | 14,770 | - |
| Legacy Light Curves of a Volume-Complete Sample of the Nearby Mid-to-Late M Dwarfs with TESS | 43.001 | 80NSSC19K0635 | | 4,903 | - |
| Management of the GEOS-Chem Chemical Transport Model and Application to Improve Understanding of Tropospheric Ozone | 43.001 | NNX15AB09G | | 124,954 | - |
| Mapping the true boundary of dark matter halos with the splashback radius | 43.001 | HST-HF2-51406.001-A | | 29,090 | - |
| Merging and Observing Massive Black Hole Binaries: Interactions with a Gas Disk | 43.001 | PF6-170151 | | 14,333 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Metasurfaces for Compact, Next-Generation Polarimetric Remote Sensing of Aerosols and Clouds | 43.001 | 80NSSC20K0318 | | 14,986 | - |
| Miniature Light-weight X-ray Optics for Solar System Exploration | 43.001 | NNX16AL75G | | 79,571 | 22,828 |
| Modeling the Turbulent Evolution of Galaxies over Cosmic Time | 43.001 | HST-HF2-51445.001-A | | 94,275 | - |
| Multi-Scale Data Assimilation and Model Comparison for ABoVE to Identify Processes Controlling CO2 and CH4 Exchange and Influencing Seasonal Transitions in Arctic Tundra Ecosystems | 43.001 | NNX17AE75G | | 155,048 | 61,945 |
| Periodic Self-Lensing from Accreting Supermassive Black Hole Binaries | 43.001 | GO9-20037X | | 31,559 | - |
| Quantifying and Partitioning the Global Methane Budget Using Satellite and Ground Based Measurements Of CH4 and Tracers of Its Sources and Sinks | 43.001 | 80NSSC20K0009 | | 22,547 | - |
| Rapid Observations of Short-Duration Gamma-Ray Bursts: Accurate Positions Hold the Key to the Progenitor Population | 43.001 | GO8-19045X | | 38,315 | - |
| Reducing the Effect of Stellar Jitter to Enable RV Measurements of Earth-Like Exoplanets. | 43.001 | NNX16AD42G | | 143,106 | 65,026 |
| Ruprecht 106: Too small to succeed | 43.001 | HST-GO-14726.004-A | | 469 | - |
| Shocks Across Simulated Cosmological Environments | 43.001 | 80NSSC18K1111 | | 41,238 | - |
| Spectral Signatures of Atmospheric Escape in Exoplanets | 43.001 | HST-HF2-51443.001-A | | 109,201 | - |
| Supernova 1987A at 30 years | 43.001 | HST-GO-14753.002-A | | 28,474 | - |
| Supernovae in the Infrared avec Hubble | 43.001 | HST-GO-15889.004-A | | 16,000 | - |
| The Emergence of Galactic Structure | 43.001 | HST-HF2-51416.001-A | | 100,018 | - |
| The Hubble Constant to 1 percent: Physics beyond LambdaCDM | 43.001 | HST-GO-15145.007-A | | 9,971 | - |
| The isotopic consequences of microbial sulfur disproportionation | 43.001 | NNX15AP58G | | 22,101 | - |
| Tidal Disruption Events Unveiled: Directly Probing the Accretion Disks Through Late-Time Chandra Observations | 43.001 | GO9-20092A | | 34,160 | - |
| Towards a Complete Understanding of Stellar Feedback in Massive Star Formation | 43.001 | PF7-180166 | | 105,981 | - |
| Transit Search Around 2 White Dwarfs with Infrared Excesses | 43.001 | 80NSSC18K0295 | | 7,918 | - |
| Understand predictability and improve prediction of atmospheric blocking and associated extreme weathe | 43.001 | 80NSSC17K0267 | | 75,952 | - |
| Understanding The Atmospheric Methane Budget And Trends Using Satellite Observations In Combination With New Emission Inventories And Biogeochemical Models | 43.001 | NNX17AK81G | | 320,646 | - |
| UNIQUE INSIGHTS INTO SWIFT GRBS WITH THE VLA AND ALMA | 43.001 | 80NSSC19K0456 | | 39,000 | - |
| Using Linear Mixed Effects Modeling to Improve Stability of Total Solar Irradiance Reconstructions | 43.001 | 80NSSC19K1327 | | 32,340 | - |
| UV Spectroscopy of the Nearby Superluminous Supernova SN2018bsz | 43.001 | HST-GO-15488.001-A | | 37,954 | - |
| Watching Supernovae Explode: The K2 Supernova Experiment | 43.001 | HST-GO-15274.002-A | | 21,428 | - |
| **Total for CFDA 43.001** | | | | 6,793,460 | 420,691 |
| Crowd Innovation Laboratory at Harvard University NASA Open Innovation Research | 43.003 | NNX16AC77A | | 229,638 | - |
| **Total for CFDA 43.003** | | | | 229,638 | - |
| Nicotinamide dinucleotide (NAD)-boosting as a strategy to mitigate musculoskeletal loss during space exploration | 43.007 | 16-ROSBFP-PD-0004 | | 63,221 | - |
| Physics of Colloids in Space | 43.007 | 80NSSC19K0598 | | 162,797 | - |
| **Total for CFDA 43.007** | | | | 226,018 | - |
| Developing a multi-scale understanding of the kinetics of dehydration and rehydration in a model cellular food system | 43.012 | 80NSSC19K1146 | | 56,652 | - |
| **Total for CFDA 43.012** | | | | 56,652 | - |
| A Year in the Whirlpool | 43.RD | HST-GO-14704.001-A | | 64,348 | - |
| Atmospheric Escape from the Closest Super-Earth | 43.RD | HST-GO-14461.002-A | | 4,024 | - |
| Going gently into the night: constraining Type Ia supernova nucleosynthesis using late-time photometry | 43.RD | HST-GO-14611.008-A | | (490) | - |
| Initial Reconnaissance of a Transiting Rocky Planet in a Nearby M-Dwarf's Habitable Zone | 43.RD | HST-GO-14888.002-A | | 10,895 | - |
| Measuring the Star Formation History of the Local Universe | 43.RD | HST-AR-14557.001-A | | 1,981 | - |
| The Evaporating Exosphere of a Young Planet | 43.RD | HST-GO-14615.002-A | | 47,818 | - |
| **Total for CFDA 43.RD** | | | | 128,576 | - |
| **Total for NASA Direct Awards** | | | | 7,434,344 | 420,691 |
| **Institute of Museum and Library Services** | | | | | |
| Understanding What Constitutes a Vibrant Open-Source Community | 45.312 | LG-72-18-0147-18 | | 11,318 | - |
| **Total for CFDA 45.312** | | | | 11,318 | - |
| **Total for Institute of Museum and Library Services Direct Awards** | | | | 11,318 | - |
| **National Endowment for the Humanities** | | | | | |
| Women's Worlds in Qajar Iran (NEH HCRR) | 45.149 | PW-259037-18 | | 125,480 | - |
| **Total for CFDA 45.149** | | | | 125,480 | - |
| The Story of 'Ashley's Sack': A Family Heirloom in the Smithsonian's National Museum of African American History and Culture | 45.160 | FZ-256478-17 | | 49 | - |
| **Total for CFDA 45.160** | | | | 49 | - |
| **Total for National Endowment for the Humanities Direct Awards** | | | | 125,529 | - |
| **National Science Foundation** | | | | | |
| 10th Annual Wyss International Symposium: Next-Generation Diagnostics | 47.041 | CBET-1931946 | | 14,995 | - |
| CAREER: First Principles Design of Error-Corrected Solid-State Quantum Repeaters | 47.041 | ECS-1944085 | | 3,926 | - |
| CAREER: Optimization, Control, and Incentive Design for Power Networks with High Levels of Distributed Energy Resources | 47.041 | ECCS-1553407 | | 51,961 | - |
| Collaborative Research: Integrated memristor neural networks for in-situ analysis of intracellular neuronal recordings | 47.041 | ECCS-1915984 | | 56,024 | - |
| Collaborative Research: Mechanics of fusion of dissimilar lipid bilayers and multi-lamellar vesicles | 47.041 | CBET-1705775 | | 58,798 | - |
| Collaborative Research: Quantum cascade laser sources of high-power, coherent frequency combs | 47.041 | ECCS-1614631 | | 5,584 | - |
| Collaborative Research: Quantum cascade laser transceivers for terahertz wireless communication | 47.041 | ECCS-1807323 | | 152,429 | - |
| Collaborative Research: Towards Communication-Cognizant Voltage Regulation and Energy Management for Power Distribution Systems | 47.041 | ECCS-1608509 | | 14,054 | - |
| CQIS: Coherent Spin-Phonon Interfaces with Diamond Color Centers | 47.041 | ECCS-1810233 | | 120,355 | - |
| Data-Driven Management of Post-Transplant Medications | 47.041 | CMMI-1562645 | | 32,678 | - |
| E2CDA: Type II: Collaborative Research: Nanophotonic Lithium Niobate platform for next generation energy efficient and ultrahigh bandwidth optical interconnect | 47.041 | ECCS-1740296 | | 35,649 | - |
| EAGER: Deterministic Placement of Qubits in Cavities for Strongly Coupled Quantum Repeaters | 47.041 | ECCS-1748106 | | 57,573 | - |
| EAGER: Combining van der Waals heterostructures and superlattices: new approach to 2D tunable optoelectronic devices | 47.041 | ECCS-2015668 | | 7,486 | - |
| EAGER: Real-Time: Learning, Selection, and Control in Residential Demand Response for Grid Reliability | 47.041 | ECCS-1839632 | | 52,004 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| EFRI 2-DARE: Quantum Optoelectronics, Magnetolectronics and Plasmonics in 2-Dimensional Materials Heterostructures | 47.041 | EFMA-1542807 | | 33,760 | - |
| EFRI C3 SoRo: Textile Robotics: Integrative Design, Modeling, Manufacture, and Control of Soft Human-Interactive Apparel | 47.041 | EFMA-1830896 | | 644,258 | 122,125 |
| EFRI NewLAW: Topological Mechanical Metamaterials Science | 47.041 | EFMA-1741685 | | 537,316 | 305,815 |
| FW-HTF: Collaborative Research: The Next Mobile Office: Safe and Productive Work in Automated Vehicles | 47.041 | CMMI-1839870 | | 144,068 | - |
| COVID-19 - COVID Supplement: FW-HTF: Collaborative Research: The Next Mobile Office: Safe and Productive Work in Automated Vehic | 47.041 | CMMI-1839870 | | 6,147 | - |
| GOALI: Nano-Machining of Diamond Mirror for High-Power Laser Optics | 47.041 | CMMI-1825257 | | 231,399 | - |
| Kinetics and stability of redox-active organics for electrochemical systems | 47.041 | CBET-1914543 | | 220,269 | - |
| NNCI: The Center for Nanoscale System (CNS) at Harvard University | 47.041 | ECCS-1541959 | | 813,401 | - |
| NRI: Achieving selective kinematics and stiffness in flexible robotics | 47.041 | CMMI-1637838 | | 61,423 | - |
| NRI: FND: COLLAB: A Foundational Approach to Muscle Actuators that Lowers Barriers to Muscle-Powered Robotics Research | 47.041 | CMMI-1830291 | | 117,100 | - |
| NRI: INT: Wearable Robots for the Community: Personalized Assistance using Human-in-the- loop Optimization | 47.041 | CMMI-1925085 | | 224,873 | - |
| NSF 15-022 Fate of aerosolized Nanoparticles: the influence of surface active substances on lung deposition and respiratory effects (NANOaers) | 47.041 | 1530767 | | 29,195 | - |
| PFI:TT Metabolic Imaging to Measure Oocyte Quality | 47.041 | IIP-1827309 | | 133,654 | - |
| PFI-TT:Development of an efficient fiber interface for Integrated lithium-niobate Modulators. | 47.041 | IIP-1827720 | | 30,116 | - |
| RAISE TAQS: Towards a Quantum Cloud | 47.041 | ECCS-1839197 | | 392,231 | 243,184 |
| **Total for CFDA 47.041** | | | | 4,282,726 | 671,124 |
| Collaborative Research: Developing rural girls' STEM competency and motivation through communicating scientific topics with advanced technology | 47.046 | DRL-1657017 | | 51,500 | - |
| **Total for CFDA 47.046** | | | | 51,500 | - |
| Admissible Lagrangians, Fukaya categories, and homological mirror symmetry. | 47.049 | DMS-1937869 | | 60,169 | - |
| Algebraic geometric approaches to biological complexity | 47.049 | DMS-1462629 | | 265,422 | - |
| Analysis, Geometry and Mathematical Physics | 47.049 | DMS-1607871 | | 112,159 | - |
| Arithmetic Geometry | 47.049 | DMS-1601054 | | 23,062 | - |
| Arithmetic Geometry and Applications | 47.049 | DMS-1902158 | | 125,314 | - |
| ATD: Collaborative Research: Spectral Interpretations of Essential Subgraphs for Threat Discoveries | 47.049 | DMS-1737873 | | 34,720 | - |
| CAREER: Adapting the fluid projection method to model elasto-plastic materials | 47.049 | DMS-1753203 | | 72,586 | - |
| CAREER: Chemically-Enabled Strategies for the Discovery and Characterization of Novel Enzymatic Function | 47.049 | CHE-1454007 | | 19,730 | - |
| CAREER: Extreme climate perturbations by meteorite impacts and volcanism on terrestrial planets | 47.049 | AST-1847120 | | 67,450 | - |
| CAREER: Nanobody technology to decipher the essential roles of O-GlcNAc in cells | 47.049 | CHE-1942574 | | 31,045 | - |
| CAREER: Stochastic effects in the microbial cell cycle: from single-cell level variability to population growth | 47.049 | PHY-1752024 | | 173,294 | - |
| CAREER: Unbiased Estimation with Faithful Markov Chains for Scalable Statistical Inference | 47.049 | DMS-1844695 | | 91,363 | - |
| CAS: Collaborative Research: Electronic Structure/Function Relationships in Base Metal Complexes Spanning the Oxo/Oxene and Imide/Nitrene Continuum | 47.049 | CHE-1954690 | | 1,722 | - |
| CASPER2019: Heterogeneous Architectures -- FPGA, GPU, and now System on Chip | 47.049 | AST-1932156 | | 49,477 | - |
| CDS and E: Collaborative Research: Computational Design of Topological Superconductors and Weyl - Dirac Semimetals | 47.049 | DMR-1827925 | | 15,870 | - |
| Center for Integrated Quantum Materials | 47.049 | DMR-1231319 | | 5,378,147 | 2,876,223 |
| Classical and Quantum Aspects of Black Holes, Horizons and Asymptotic Symmetries | 47.049 | PHY-1707938 | | 129,733 | - |
| Collaborative Research: Highly Principled Data Science for Multi-Domain Astronomical Measurements and Analysis | 47.049 | DMS-1811308 | | 56,486 | - |
| Collaborative Research: Atomic-Scale Hybrids, Tuning the IR Dielectric Function through Superlattice Design | 47.049 | DMR-1905295 | | 114,107 | - |
| Collaborative Research: Exploring the physics of galaxy clusters with comprehensive cosmological simulations | 47.049 | AST-1815978 | | 141,391 | - |
| Collaborative Research: Formation of a High Flux Student Research Network (HF-SRN) as a Laboratory for Enhancing Interaction in the PoLS SRN | 47.049 | 1806818 | | 266,449 | - |
| Collaborative Research: Multiscale Modeling of Amorphous Solids - Energy Landscapes to Failure Prediction | 47.049 | DMR-1909733 | | 1,402 | - |
| Collaborative Research: Novel statistical tools for metagenomics and metabolomics data | 47.049 | DMS-1903139 | | 51,646 | - |
| Collaborative Research: Pioneering planet formation chemistry with ALMA | 47.049 | AST-1907832 | | 74,238 | - |
| Collaborative Research: Theoretical and Methodological Frameworks for Causal Inference of Peer Effects | 47.049 | DMS-1712714 | | 81,929 | - |
| Collective Ecophysiology and Physics of Social Insects | 47.049 | PHY-1606895 | | 127,810 | - |
| Colloids as Models for Crystals and Glasses | 47.049 | 1611089 | | 23,202 | - |
| Completion of Scanning, Data Releases and Optimization of Analysis and Database for DASCH | 47.049 | AST-1910561 | | 47,689 | - |
| Complex Dynamics and Moduli Spaces | 47.049 | DMS-1608432 | | 42,635 | - |
| Complex Dynamics and Moduli Spaces | 47.049 | DMS-1903764 | | 131,164 | - |
| Conference: Current Developments in Mathematics | 47.049 | DMS-1933415 | | 9,032 | - |
| Current Developments in Mathematics Conference | 47.049 | DMS-1835084 | | 3,850 | - |
| Designer Soft Microparticles for a Changing Environment | 47.049 | DMR-1708729 | | 145,184 | - |
| Detecting hydrogen in early universe using the Large Aperture Experiment to Detect the Dark Age (LEDA) telescope | 47.049 | AST-1616709 | | 4,088 | - |
| Discovering New Physics Beyond the Standard Model with Cosmological Data Sets | 47.049 | AST-1813694 | | 79,154 | - |
| DMREF: Biologically Inspired Optimized Materials And Technologies Transformed by Evolutionary Rules (BIOMATTER) | 47.049 | DMR-1533985 | | 158,402 | 87,059 |
| DMREF: Collaborative Research: Digital Magnetic Handshake Materials, Structures, and Machines | 47.049 | DMR-1921619 | | 97,098 | - |
| DMREF: Collaborative Research: The Search for Novel Superconductors in Moire Flat Bands | 47.049 | DMR-1922172 | | 143,544 | - |
| DMREF: Hydrogel-actuated cellular soft robotic materials with programmable mechanical properties | 47.049 | DMR-1922321 | | 354,150 | - |
| DMREF: Self Assembly with DNA-Labeled Colloidal Particles and DNA Nanostructures | 47.049 | DMR-1435964 | | 8,806 | - |
| DMREF/Collaborative Research: Graphene Based Origami and Kirigami Metamaterials | 47.049 | DMR-1435999 | | 34,290 | - |
| EAGER: Building a Network of Quantum Diamond Microscope (QDM) Facilities and Researchers | 47.049 | PHY-1843727 | | 261,852 | - |
| EAGER: Defining the Role of UV light in Prebiotic Chemical Evolution: the Imidazolium Bridge in Non-enzymatic RNA Replication | 47.049 | PHY-1933505 | | 191,323 | - |
| Emerging Statistical and Quantitative Issues in Genomic Research in Health Sciences | 47.049 | DMS-1833416 | | 33,826 | - |
| Exploring the Galaxy: 3-Dimentional Structure and Stellar Streams | 47.049 | AST-1614941 | | 37,286 | - |
| Fluctuations and Control in Cells | 47.049 | DMS-1517372 | | 98,951 | - |
| FRG: Collaborative Research: Dimers in Combinatorics and Physics | 47.049 | DMS-1854316 | | 15,412 | - |
| FRG: Collaborative Research: Geometric and Topological Methods for Analyzing Shapes | 47.049 | DMS-1760471 | | 145,199 | - |
| FRG: Collaborative Research: Stability of Structures Large and Small | 47.049 | DMS-1564473 | | (3,465) | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Fundamental Physics from Astronomy and Cosmology | 47.049 | PHY-1915071 | | 70,618 | - |
| Gamma-Ray Bursts: Physics, Progenitors, and Probes | 47.049 | AST-1714498 | | 129,588 | - |
| Gauge Theory and Spatial Graphs | 47.049 | DMS-1707924 | | 84,434 | - |
| Hidden Components in Modern Applications | 47.049 | DMS-1925845 | | 84,679 | - |
| Hydrogen at Ultra-High Pressure | 47.049 | DMR-1308641 | | 55,616 | - |
| Induced Topological Superconductivity in Two Dimensional Systems | 47.049 | DMR-1708688 | | 168,688 | - |
| Institute for Theoretical, Atomic, Molecular and Optical Physics | 47.049 | PHY-1521560 | | 839,834 | 500,089 |
| Interactions of Particles, Fields and Strings | 47.049 | PHY-1719924 | | 150,881 | - |
| Interfaces of Combinatorics and Physics | 47.049 | DMS-1854512 | | 103,363 | - |
| Investigating fundamental chemical and physical processes affecting gas-particle partitioning using levitated droplet-mass spectrometry | 47.049 | CHE-1808084 | | 131,091 | - |
| Investigating Laser-Activation of Structured Polymer Materials for Drug Delivery | 47.049 | PHY-1806434 | | 137,458 | - |
| Investigating Tunneling Across Self-Assembled Monolayers Using the Eutectic Galn Junction | 47.049 | CHE-1808361 | | 179,901 | - |
| Local and Global Geometric Langlands Correspondence | 47.049 | DMS-1707662 | | 119,893 | - |
| Materials Research Science and Engineering Center | 47.049 | DMR-1420570 | | 2,372,887 | - |
| Mathematical methods to infer mechanisms from single cell data | 47.049 | DMS-1562497 | | 152,366 | - |
| Mechanistic Studies of the Photoactivation of Metal- Hydride, Halide and Oxo Bonds | 47.049 | CHE-1464232 | | 31,501 | - |
| Metallic Properties of the Isotopes of Hydrogen | 47.049 | DMR-1905943 | | 50,587 | - |
| Microscopy of bosonic fractional quantum Hall states in optical lattices | 47.049 | PHY-1806604 | | 129,463 | - |
| MINERVA: A dedicated observatory for exoplanet science | 47.049 | AST-1516242 | | 26,337 | - |
| MINERVA: Purchase of Kiwispec, a robotic precision RV spectrograph | 47.049 | AST-1608203 | | 123,380 | - |
| MRI: Development of a Scanning 4-Probe Microscope for Discovery and Characterization of Quantum Materials and Devices | 47.049 | DMR-1828569 | | 115,506 | - |
| New Algebraic Structures in Topology | 47.049 | DMS-1510417 | | 9,318 | - |
| New Directions in Homology of Moduli Spaces | 47.049 | DMS-1803766 | | 45,620 | - |
| New Frontiers in Homotopy Theory | 47.049 | DMS-1810917 | | 80,616 | - |
| New Paradigms of Quantum Criticality | 47.049 | DMR-2002850 | | 13,318 | - |
| NSF-BSF:Transport, fluctuation, and Nonequilibrium phase transition in atomically thin crystalline van der Waals superconductors | 47.049 | DMR-1809188 | | 248,809 | 90,126 |
| NSF-Simons Research Center for Mathematics of Complex Biological Systems | 47.049 | DMS-1764269 | | 978,761 | - |
| Number Theory and Geometry | 47.049 | DMS-1502161 | | 12,561 | - |
| Observational Studies of Magnetic Fields in Very Low Mass Stars | 47.049 | AST-1614770 | | 78,769 | - |
| OP: Quantum Physics with Nanaophotonics Systems | 47.049 | PHY-1506284 | | 140,447 | - |
| Order determination for hidden Markov and related models | 47.049 | DMS-1810914 | | 92,436 | - |
| Particle Physics in the Era of Data | 47.049 | PHY-1620806 | | 75,686 | - |
| Photoactivation of Stable Bonds for Energy Conversion and Photoredox Catalysis | 47.049 | CHE-1855531 | | 203,898 | - |
| Physics with New Molecular Systems: Quantum Interactions, Cooling and Applications | 47.049 | PHY-1505961 | | (11,495) | - |
| Probabilistic Underpinning of Imprecise Probability and Statistical Learning with Low-Resolution Information | 47.049 | DMS-1812063 | | 56,486 | - |
| QII-TAQS: Majorana Nanomanipulation for Topological Quantum Computing | 47.049 | OMA-1936246 | | 237,787 | 109,961 |
| Random Matrices, Statistical Applications and Spin Glass Dynamics | 47.049 | DMS-1855509 | | 88,067 | - |
| Random Matrix Theory and Applications | 47.049 | DMS-1606305 | | 2,805 | - |
| Rational development of next-generation shape memory alloys | 47.049 | DMR-1808162 | | 166,322 | - |
| Research and Education in Physical Mathematics | 47.049 | DMS-1715477 | | 132,808 | - |
| REU Site: Biomaterials Research Initiative Dedicated to Gateway Experiences | 47.049 | DMR-1559890 | | 184,623 | - |
| Scanning-releasing the full-sky-century database to DASCH for TDA | 47.049 | AST-1313370 | | 160,551 | - |
| Spectroscopy of Two Dimensional Molecular Carbon | 47.049 | CHE-1800101 | | 170,195 | - |
| State Space Models: A New Look at Smoothing, Parameter Inference, and Model Choice | 47.049 | DMS-1712872 | | 64,277 | - |
| Strongly Extended Superradiance in Diamond Meta-Materials | 47.049 | PHY-1720438 | | 97,726 | - |
| Studies of Accretion onto Black Holes | 47.049 | AST-1816420 | | 48,001 | - |
| Synthesis of New Precursors for Vapor Deposition | 47.049 | 1764338 | | 115,398 | - |
| Synthesizing and harnessing ultracold single molecules for quantum simulations | 47.049 | PHY-1806595 | | 129,279 | - |
| The Ultimate L Project | 47.049 | DMS-1664764 | | 94,251 | - |
| Theoretical Problems in Soft Matter and Quantitative Biology | 47.049 | DMR-1608501 | | 121,627 | - |
| Theories of Metals with Correlated Electrons | 47.049 | DMR-1664842 | | 181,126 | - |
| Three-Dimensional Radiation GRMHD Simulations of Accretion Flows Around Black Holes | 47.049 | AST-1312651 | | 2,260 | - |
| Topology, Geometry and Physics | 47.049 | DMS-1401192 | | 5,915 | - |
| Topology, Geometry and Physics | 47.049 | DMS-1708310 | | 115,635 | - |
| Ultracold Triatomic Molecules: Collisions and Cooling | 47.049 | PHY-1806571 | | 115,914 | - |
| Understanding Interstellar Aromatic Chemistry: An Integrated Experimental, Theoretical, and Astronomical Approach | 47.049 | AST-1908576 | | 50,091 | - |
| Understanding the Formation and Utilization of Halogenated Metabolites in Natural Product Biosynthesis | 47.049 | CHE-2003436 | | 13,696 | - |
| Variable Selection via Inverse Modeling for Detecting Nonlinear Relationships | 47.049 | DMS-1613035 | | 47,660 | - |
| Workshops: Using Physics Education Research to Improve High and Middle School Physics | 47.049 | PHY-2025683 | | 12,060 | - |
| WoU-MMA: Toward an Understanding of Common Envelope Interactions of Binary Stars | 47.049 | AST-1909203 | | 133,138 | - |
| **Total for CFDA 47.049** | | | | 19,403,906 | 3,663,458 |
| Carbon isotope fractionation in Archaea using the 3HP/4HB pathway: Prospects for paleo-geochemistry and paleo-barometry | 47.050 | OCE-1843285 | | 158,311 | - |
| A Comprehensive Coupled Model for Tropospheric Halogen Chemistry: Evaluation of Impacts on Tropospheric Ozone, Hydroxyl Radical (OH), and Mercury | 47.050 | AGS-1643217 | | 217,532 | - |
| Applying Statistical State Dynamics to Explain Spontaneous Shear/Buoyancy Layering in Stratified Turbulence | 47.050 | AGS-1640989 | | 122,829 | - |
| Atmospheric blocking: dynamics and responses to climate change | 47.050 | AGS-1552385 | | 44,485 | 23,809 |
| Belmont Forum Collaborative Research: Governance of Sociotechnical Transformations | 47.050 | ICER-1856215 | | 24,957 | 8,217 |
| Beyond ocean temperature: Extracting new dimensions of paleoclimatic information from archaeal lipids and their isotopic compositions | 47.050 | OCE-1702262 | | 41,663 | - |
| CAREER: Dynamics of surface rupturing thrust earthquakes | 47.050 | EAR-1749556 | | 107,770 | - |
| CAREER: Exploring the Earth with high-resolution paleomagnetism | 47.050 | EAR-1847042 | | 91,093 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| CAREER: Quantifying the flux and isotope effects associated with sulfur-bearing intermediate species within dissimilatory sulfate reduction | 47.050 | EAR-1149555 | | 17,677 | - |
| Collaborative Proposal - PREEVENTS Track 2: Cascadia Scenario Earthquakes: Source, Path, and implications for Earthquake Early Warning | 47.050 | ICER-1663827 | | 149,311 | - |
| Collaborative Research: ICECAP (Ice Age Chemistry and Proxies) Phase 3: Investigating Fire Activity and its Implications for Climate Across Multiple Timescales | 47.050 | AGS-1702814 | | 139,509 | - |
| COLLABORATIVE RESEARCH: A multidimensional approach to understanding microbial carbon cycling beneath the seafloor during cool hydrothermal circulation | 47.050 | OCE-1635365 | | 112,685 | - |
| Collaborative Research: A Teleconnection between the Tropical Madden-Julian Oscillation and Arctic Sudden Stratospheric Warming Events in Warm Climates | 47.050 | AGS-1826635 | | 121,385 | - |
| Collaborative Research: Constraining West Antarctic Ice Sheet elevation during the last interglacial | 47.050 | OPP-1744927 | | 16,329 | - |
| Collaborative Research: Cross-Validation of Empirical and Physics-based ground motion predictions | 47.050 | EAR-1850015 | | 69,821 | - |
| Collaborative research: Deep eastern ocean boundary currents from local submesoscale potential vorticity dynamics to global climate implications | 47.050 | OCE-1535800 | | 4,206 | - |
| Collaborative Research: Development of a novel way for understanding ancient Earth atmospheres and marine sulfate using the stable isotope of Oxygen (17O) in marine barite | 47.050 | OCE-1821958 | | 82,083 | - |
| Collaborative research: Dynamics of unsaturated downdrafts, cold pools, and their roles in convective initiation and organization | 47.050 | AGS-1649819 | | 178,981 | 36,289 |
| Collaborative Research: Experimental and theoretical characterization of rapid Jurassic true polar wander | 47.050 | EAR-1723023 | | 42,161 | - |
| Collaborative Research: Imaging the Beginning of Time from the South Pole: The next Stage of the BICEP Program | 47.050 | OPP-1638957 | | 429,667 | - |
| Collaborative Research: Integrating GEOS-Chem atmospheric chemistry into the NCAR Community Earth System Model (CESM) | 47.050 | AGS-1914903 | | 69,251 | - |
| Collaborative Research: P2C2--Does Liebig's Law Allow for Capturing More Signal from the Forest | 47.050 | AGS-1903657 | | 107,831 | - |
| Collaborative Research: P2C2: Re-assessing Pliocene and Miocene warm climates and identifying the 'missing physics' to explain them | 47.050 | OCE-1602864 | | 53,445 | - |
| Collaborative Research: Unlocking the Cenozoic/Cretaceous seawater sulfate record via inclusion of 17O in marine barite | 47.050 | OCE-1946137 | | 18,778 | - |
| Collaborative Research: Unmanned aerial vehicles for emissions and chemistry of volatile organic compounds over the Amazon tropical forest | 47.050 | AGS-1829025 | | 243,438 | - |
| Collaborative Research: Using a hierarchy of models to constrain the temperature dependence of climate sensitivity | 47.050 | AGS-1622985 | | 23,930 | - |
| CoPe: EAGER: Collaborative Research: Development of A Novel, Mobile Coastal Observatory for Quantifying Coastal Carbon Cycling by Professional and Citizen Scientists | 47.050 | ICER-1940100 | | 2,202 | - |
| Development of a simple, low-cost device for sample collection and on-site preservation using a common oceanographic deployment platform | 47.050 | OCE-1924214 | | 35,345 | - |
| Dynamic Exchange and Reactivity in Secondary Organic Aerosol | 47.050 | AGS-1640378 | | 261,704 | - |
| EAGER: MethaneAIR | 47.050 | AGS-1856426 | | 119,057 | - |
| EAGER: Unraveling riverine sulfate using minor oxygen isotopes | 47.050 | EAR1839341 | | 90,327 | - |
| Elucidating the Mechanics of Tsunami Generating Earthquake Rupture with Long Period Seismology | 47.050 | OCE-1850831 | | 159,117 | - |
| Evaluating the Impact of Future Volcanic Eruptions on Stratospheric Ozone: Influence of Multicomponent Injenction, Climate Change, Latitude, and Seasonality | 47.050 | AGS-1764171 | | 161,182 | - |
| FESD Type I: VOICE - Volcano, Ocean, Ice, and Carbon Experiments | 47.050 | AGS-1338832 | | 297,531 | 24,227 |
| Immunotoxicity in Humans with Lifetime Exposure in Ocean Pollutants | 47.050 | OCE-1321612 | | 162,661 | 66,597 |
| NSF/GEO–NERC collaborative research: Dynamics of warm past and future climates | 47.050 | AGS-1924538 | | 43,875 | - |
| OTREC: Convective Heating Profiles and the Transition from Shallow to Deep Convection over the Tropical East Pacific and Southwest Caribbean | 47.050 | AGS-1759255 | | 96,325 | - |
| Petrogenetic Studies of Young Volcanic Rocks | 47.050 | OCE-1634421 | | 87,433 | - |
| The Ninth International GEOS-Chem Meeting (IGC9); Cambridge, Massachusetts; May 6-9, 2019 | 47.050 | AGS-1855750 | | 14,136 | - |
| Use of Artificial Intelligence towards Automation of Analog Seismogram Digitization | 47.050 | EAR-1822136 | | 45,307 | - |
| **Total for CFDA 47.050** | | | | 4,265,330 | 159,139 |
| AF: Large: Collaborative Research: Algebraic Proof Systems, Convexity, and Algorithms | 47.070 | CCF-1565264 | | 152,239 | - |
| AF: Medium: Algorithmic Complexity in Computation and Biology | 47.070 | CCF-1509178 | | 189,688 | - |
| AF: Medium: Collaborative Proposal: Foundations of Adaptive Data Analysis | 47.070 | CCF-1763665 | | 133,076 | - |
| AF: Medium: Collaborative Research: Exploiting Opportunities in Pseudorandomness | 47.070 | CCF-1763299 | | 222,493 | - |
| AF: Small: Communication Amid Uncertainty | 47.070 | CCF-1715187 | | 82,570 | - |
| AF: Small: Learning and Optimization with Strategic Data Sources | 47.070 | CCF-1718549 | | 153,730 | - |
| AF:Small: Foundations for Data-driven Algorithmics | 47.070 | CCF-1816874 | | 98,384 | - |
| AitF: FULL: Collaborative Research: Better Hashing for Applications: From Nuts and Bolts to Asymptotics | 47.070 | CCF-1535795 | | 162,352 | - |
| BD Spokes: SPOKE: NORTHEAST: Collaborative Research: Integration of environmental factors and causal reasoning approaches for large-scale observational health research | 47.070 | IIS-1636870 | | 73,930 | - |
| CAREER: A Programmable Measurement Architecture for Network Operations | 47.070 | CNS-1834263 | | 62,620 | - |
| CAREER: Algorithmic Foundations for Social Data | 47.070 | CCF-1452961 | | 94,224 | - |
| Career: Evolutionary Data Systems | 47.070 | IIS-1452595 | | 21,840 | - |
| CAREER: Generative Models for Targeted Domain Interpretability with Applications to Healthcare | 47.070 | IIS-1750358 | | 53,395 | - |
| CAREER: Information-Theoretic Foundations of Fairness in Machine Learning | 47.070 | CCF-1845852 | | 96,356 | - |
| CAREER: Sketching Algorithms for Massive Data | 47.070 | CCF-1350670 | | 5,496 | - |
| Causal Inference and Machine Learning Methods | 47.070 | IIS-1941419 | | 20,666 | - |
| CIF: Medium: Collaborative Research: Information-theoretic Guarantees on Privacy in the Age of Learning | 47.070 | CCF-1900750 | | 26,969 | - |
| CIF: NeTS: Medium: Collaborative Research: Unifying Data Synchronization | 47.070 | CCF-1563710 | | 90,373 | - |
| CIF: Small: Exploring and Exploiting the Universality Phenomenon in High-Dimensional Estimation | 47.070 | CCF-1910410 | | 244,230 | - |
| CIF: Small: High-Dimensional Analysis of Stochastic Iterative Algorithms for Estimation and Learning | 47.070 | CCF-1718698 | | 24,097 | - |
| Collaborative Research: Computational Photo-Scatterography: Unraveling Scattered Photons for Bio-imaging | 47.070 | IIS-1730326 | | 179,536 | - |
| COVID-19 - Collaborative Research: RAPID: Building a Spatiotemporal Platform for Rapid Response to COVID-19 | 47.070 | CNS-2027540 | | 4,228 | - |
| Collaborative Research: Understanding Subatomic-Scale Quantum Matter Data Using Machine Learning Tools | 47.070 | OAC-1934598 | | 244,663 | - |
| CPS: TTP Options: Synergy: Human-Machine Interaction with Mobility Enhancing Soft Exosuits | 47.070 | CNS-1446464 | | 36,127 | 35,060 |
| CRCNS US-German Research Proposal: Neural Computations Underlying Mechanical -Flow Sensing in Zebrafish | 47.070 | IIS-1912293 | | 85,294 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| CRII: RI: Practical Algorithms for Robust Feedback Motion Planning Through Contact | 47.070 | IIS-1657186 | | 12,053 | - |
| CSR: Medium: Collaborative Research: Soup: Flexible Storage and Processing for On-Line Applications | 47.070 | CNS-1704376 | | 151,219 | - |
| CSR: SMALL: Virtualized accelerators for scalable, composable architectures | 47.070 | CNS-1718160 | | 18,667 | - |
| Deep Annotation: Measuring Human Vision to Improve Machine Vision | 47.070 | IIS-1409097 | | 21,149 | - |
| EAGER: AI-DCL: Collaborative Research: Understanding and Overcoming Biases in STEM Education Using Machine Learning | 47.070 | IIS-1926925 | | 22,652 | - |
| EAGER: Developing Markets | 47.070 | CCF-1841550 | | 1,828 | - |
| EAGER: Making with Understanding | 47.070 | IIS-1748093 | | 45,765 | - |
| Elements: FLARE infrastructure for reproducible active learning of Bayesian force fields for ex-machina exascale molecular dynamics | 47.070 | 2003725-OAC | | 10,684 | - |
| EXP: Collaborative Research: Extracting Salient Scenarios from Interaction Logs (ESSIL) | 47.070 | IIS-1623124 | | 18,241 | - |
| III: CHS: Medium: Visually Interactive Neural Probabilistic Models of Language | 47.070 | IIS-1901030 | | 39,532 | - |
| Making With Understanding: Using Augmented Reality to Support Peer Teaching in Makerspaces | 47.070 | IIS-1917716 | | 90,646 | - |
| NCS-FO: Analyzing Synapses, Motifs and Neural Networks for Large-scale Connectomics | 47.070 | IIS-1835231 | | 359,248 | - |
| NeTS: Small: Collaborative Research: Distributed Approximate Packet Classification | 47.070 | CNS-1829349 | | 119,537 | - |
| NRI: FND: Robust Grasping by Integrating Machine Learning with Physical Models | 47.070 | IIS-1924984 | | 135,734 | - |
| NRI: Instructional Materials for Soft Co-Robot Design to Improve Motivation and Learning in STEM Classrooms | 47.070 | IIS-1526327 | | 9,670 | - |
| Phase II I/UCRC Harvard: Center for Spatiotemporal Thinking, Computing and Applications (STCA) | 47.070 | CNS-1841403 | | 87,120 | - |
| RAPID: Collaborative research: Computational Drug Repurposing for COVID-19 | 47.070 | 2030459 | | 8,843 | - |
| RI: Large: Collaborative Research: Reconstructive Recognition: Uniting statistical scene understanding and physics-based visual reasoning | 47.070 | IIS-1212928 | | (4,571) | (4,571) |
| RI: Medium: End-to-end Computational Sensing | 47.070 | IIS-1900847 | | 137,450 | - |
| RI: Small: Collaborative Research: Hidden Parameter Markov Decision Processes: Exploiting Structure in Families of Tasks | 47.070 | IIS-1718306 | | 33,769 | - |
| RI: Small: Collaborative Research: Structured Inference for Low-level Vision | 47.070 | IIS-1618227 | | 96,248 | - |
| RI: Small: Computational Social Choice: For the People | 47.070 | IIS-2024287 | | 78,332 | - |
| RI: Small: Depth from Differential Defocus | 47.070 | IIS-1718012 | | 88,716 | - |
| S and AS: INT: RoboBees 2.0 towards autonomous micro air vehicles | 47.070 | IIS-1724197 | | 142,618 | - |
| SHF:Medium:A Cloudless Universal Translator | 47.070 | CCF-1704834 | | 125,583 | - |
| SI2-SSE: Collaborative Research: A Sustainable Future for the Glue Multi-Dimensional Linked Data Visualization Package | 47.070 | OAC-1739657 | | 115,775 | - |
| SI2-SSI: Collaborative Research: Bringing End-to-End Provenance to Scientists | 47.070 | ACI-1450277 | | 277,286 | 105,669 |
| TWC: Large: Collaborative: Computing Over Distributed Sensitive Data | 47.070 | CNS-1565387 | | 538,402 | 281,344 |
| TWC: SMALL: Complexity Assumptions for Cryptographic Schemes | 47.070 | CNS-1618026 | | 113,688 | - |
| US-Israel Collaboration: Collaborative Research: New Tools for Extracting Neuronal Phenotypes from a Volumetric Set of Cerebral Cortex I | 47.070 | IIS-1607800 | | 30,069 | - |
| WORKSHOP: Student Innovation Challenge at User Interface Software and Technology 2019 | 47.070 | IIS-1929082 | | 9,898 | - |
| XPS: FULL: CCA: Collaborative Research: Automatically Scalable Computation | 47.070 | CCF-1533737 | | 239,728 | - |
| **Total for CFDA 47.070** | | | | 5,734,155 | 417,502 |
| 1000 species and counting: Harnessing the power of herbarium digitization, crowdsourcing, and phylofloristics to assess and predict phenological responses | 47.074 | DEB-1754584 | | 149,538 | - |
| BRAIN EAGER: Functional dynamics of whole brain activity, behavior, and development from birth to adulthood | 47.074 | IOS-1452593 | | 1,279 | - |
| CAREER: Developmental network architecture underlies patterning precision and robustness | 47.074 | IOS-1452557 | | 71,389 | - |
| CAREER: Testing the contributions of selection, gene-flow, and recombination to reinforcement | 47.074 | DEB-1844906 | | 210,089 | - |
| CAREER: The evolution of gene regulatory networks for regeneration | 47.074 | IOS-1652104 | | 223,532 | - |
| CNH-L: Social-ecological traps and interactive dynamics of reef fisheries and human health | 47.074 | 1826668 | | 358,535 | 216,164 |
| CNH-L:Assessing the potential for climate change and forest insects to drive land-use regime shifts | 47.074 | DEB-1617075 | | 102,890 | 16,041 |
| Collaborative Research: ButterflyNet--an integrative framework for comparative biology | 47.074 | DEB-1541560 | | 151 | - |
| Collaborative Research: Comparative Genomics of Host-specific Adaptation and Life History Evolution in Brood Parasitic Birds | 47.074 | DEB-1754397 | | 22,644 | - |
| Collaborative Research: Convergent evolution and diversification of the crab body plan over 200 million years | 47.074 | DEB-1856679 | | 128,034 | - |
| Collaborative Research: Evolving the mammalian forelimb: modeling musculoskeletal transformation in the forerunners of mammals | 47.074 | DEB-1754459 | | 141,464 | - |
| Collaborative Research: IDBR: TYPE A: Development of Squishy Robot Hands for a Delicate, Effective and Non-Intrusive Approach to Studying Deep Coral Reefs | 47.074 | DBI-1556164 | | 92,404 | - |
| Collaborative Research: Molecular Genetic Studies of Bdelloid Rotifers | 47.074 | MCB-0923628 | | (360) | - |
| Collaborative Research: NSF/MCB: Kinetic Control of the Transcription Cycle Revealed by Synthetic Enhancers | 47.074 | 1715184 | | 240,522 | - |
| Collaborative Research: Physiology of Long Distance Assimilate Transport | 47.074 | IOS-1456845 | | 66,095 | - |
| Collaborative Research: The Aquilegia Petal as a Model for the Elaboration and Evolution of Organ Shape | 47.074 | IOS-1456217 | | 13,417 | - |
| Collaborative Research: The Opiliones of New Zealand: Revisionary synthesis and application of species delimitation for testing biogeographic hypotheses | 47.074 | DEB-1754278 | | 275,618 | - |
| Combinatorial Inference: Statistical Uncertainty Assessment for Discrete Structures | 47.074 | 1916211 | | 34,388 | - |
| Designing and analyzing multi-generational switching in gene circuits for single cell biology | 47.074 | 1615487 | | 21,842 | - |
| Digitization TCN: Collaborative Research: Digitizing endless forms: Facilitating Research on Imperiled Plants with Extreme Morphologies | 47.074 | DBI-1802209 | | 207,139 | - |
| Digitization TCN: Collaborative Research: Enhancing Access to Taxonomic and Biogeographical Data to Stem the Tide of Extinction of the Highly Imperiled Pacific Island Land Snails | 47.074 | DBI-1902188 | | 18,386 | - |
| Digitization TCN: Collaborative Research: Lepidoptera of North America Network: Documenting Diversity in the Largest Clade of Herbivores | 47.074 | DBI-1601124 | | 21,904 | - |
| Digitization TCN: Collaborative Research: oVert: Open Exploration of Vertebrate Diversity in 3D | 47.074 | DBI-1702263 | | 40,564 | - |
| Digitization TCN: Collaborative Research: Using Herbarium Data To Document Plant Niches In The High Peaks And High Plains Of The Southern Rockies - Past, Present, And Future | 47.074 | DBI-1702322 | | 146,177 | - |
| Dimensions US-BIOTA-Sao Paulo: Collaborative Proposal: Traits as predictors of adaptive diversification along the Brazilian Dry Diagonal | 47.074 | DEB-1831560 | | 75,429 | - |
| DIMENSIONS: COLLABORATIVE RESEARCH: The phylogenetic and functional diversity of extracellular electron transfer across all three domains of life | 47.074 | DEB-1542506 | | 140,396 | - |
| Discovering the Mechanistic Basis of Individual Differences in Sensory Representation and their Effects on Preference Behavior | 47.074 | IOS-1557913 | | 63,184 | - |
| DISSERTATION RESEARCH: Evaluating the role of thyroid hormone in embryonic limb development in direct-developing frogs | 47.074 | DEB-1701591 | | 2,337 | - |
| DISSERTATION RESEARCH: Integrative research in gastropods: Phylogeny and shell shape evolution | 47.074 | DEB-1701648 | | 813 | - |

**Harvard University**
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| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| DISSERTATION RESEARCH: The Evolution of Crocodylian Cranial Development | 47.074 | DEB-1701745 | | 8,339 | - |
| EAGER: A novel mechanism regulating leaf water transport: Reversible collapse of xylem conduits | 47.074 | IOS-1659918 | | 91,227 | - |
| Examining the correlated molecular mechanisms of self and heterospecific pollen-pistil recognition | 47.074 | IOS-1906113 | | 95,121 | - |
| HFR LTER V: New Science, Synthesis, Scholarship, and Strategic Vision for Society | 47.074 | DEB-1237491 | | 157,214 | 3,079 |
| Ideas Lab Collaborative Research: Using natural odor stimuli to crack the olfactory code | 47.074 | IOS-1555914 | | 232,486 | - |
| LTER: From Microbes to Macrosystems: Understanding the response of ecological systems to global change drivers and their interactions | 47.074 | DEB-1832210 | | 766,371 | 235,154 |
| MRI: Development of a Microelectromagnetic, Laser Ablation Instrument for Biomechanics | 47.074 | DBI-1919834 | | 191,693 | - |
| PAPM EAGER: Identifying Small Molecule Inhibitors that Manipulate | 47.074 | MCB-1650086 | | 4,077 | - |
| RAPID: Is Carbon Starvation a Proximal Cause of Tree Mortality from Defoliation | 47.074 | DEB-1926052 | | 67,259 | - |
| RCN-SEES: Integrating Land-Use Scenarios, Ecosystem Services, and Linkages to Society (Scenarios, Services, and Society - S3) | 47.074 | DEB-1338809 | | 38,279 | - |
| Recombination and the Dynamics of Adaptation in Experimental Saccharomyces Cerevisiae (yeast) Populations | 47.074 | DEB-1655960 | | 109,286 | - |
| Resources for mixed model association mapping of complex traits | 47.074 | 1349449 | | 41,337 | - |
| REU Site: A forest full of Big Data: the Harvard Forest Summer Research Program in Ecology 2015-2019 | 47.074 | DBI-1459519 | | 143,512 | - |
| REU Site: Evolution, Ecology, Environment | 47.074 | DBI-1757780 | | 81,710 | - |
| REU Site: Summer Research Program in Ecology at Harvard ForestREU Site: Summer Research Program in Ecology at Harvard Forest | 47.074 | 1950364-DBI | | 5,461 | - |
| **Total for CFDA 47.074** | | | | 4,903,172 | 470,438 |
| 2018 Cooperative Congressional Election Study | 47.075 | SES-1756447 | | 228,123 | 97,484 |
| A Robust and Reliable Resource for Accessing, Sharing, and Analyzing Confidential Geospatial Research Data | 47.075 | BCS-2025783 | | 54,034 | 43,527 |
| Bargaining and Network Formation: Equilibrium Medical Provider Networks in Health Care Markets | 47.075 | SES-1730063 | | 70,985 | - |
| CAREER: Dynamic Decision Theory and Bounded Rationality | 47.075 | SES-1255062 | | 21,405 | - |
| CAREER: Engineering opportunity: Manipulating choice architecture to attenuate social bias | 47.075 | BCS-1653188 | | 161,646 | - |
| CAREER: Experimental pragmatics and semantics in visual language | 47.075 | BCS-1945707 | | 36,348 | - |
| CAREER: Global Transport Markets: impact on trade and efficiency | 47.075 | SES-1847555 | | 52,221 | - |
| CAREER: Psychological and Neurodevelopmental Mechanisms of Social Influence on Adolescent Decision-Making | 47.075 | BCS-1452530 | | 78,374 | - |
| CAREER: Strategic behavior, beliefs, and interventions in networks | 47.075 | SES-1847860 | | 1,129 | - |
| CAREER: Using Field Experiments to Identify Barriers to Labor Market Success and Human Capital Accumulation | 47.075 | SES-1454476 | | 146,704 | - |
| Collaborative Conference Proposal: Support for Conferences and Mentoring of Women and Underrepresented Groups in Political Methodology | 47.075 | SES-1922190 | | 139,744 | - |
| Collaborative Proposal: Friendships, Identity Development, and Adolescent Adjustment in High School | 47.075 | BCS-1745292 | | 75,172 | 16,870 |
| Collaborative Research: A New Design for Identifying Persuasion Effects and Selection in Media Exposure Experiments via Patient Preference Trials | 47.075 | SES-1526953 | | 1,324 | - |
| Collaborative Research: Comprehensive Itelmen [itl] Dictionary | 47.075 | BCS-1848934 | | 1,860 | - |
| Collaborative Research: Increasing Tax Compliance: Experimental Evidence from Pakistan | 47.075 | 1559419 | | 10,896 | - |
| Collaborative Research: The Tax Administration Production Function: Evidence from Indonesia | 47.075 | SES-1919073 | | 52,543 | - |
| Doctoral Dissertation Improvement Award: The Fit between Producers and Consumers in Traditional Society | 47.075 | BCS-1905092 | | 7,256 | - |
| Doctoral Dissertation Improvement Grant: The Independent Adaptation Of Subsistence Technologies | 47.075 | BCS-1824983 | | 12,852 | - |
| Doctoral Dissertation Research: Skill-based Neighborhood and School Sorting as Intergenerational Processes of Inequality | 47.075 | SES-1904077 | | 15,762 | - |
| Doctoral Dissertation Research: An Investigation of Opioid Addiction and Kinship Care in Central Appalachia | 47.075 | SES-1904002 | | 6,151 | - |
| Doctoral Dissertation Research: Becoming Part of the City: Place-Belonging in Urbanizing China | 47.075 | SES-1802612 | | 2,945 | - |
| Doctoral Dissertation Research: Evaluating Risk and Uncertainty in Urban Infrastructural Planning | 47.075 | BCS-1917829 | | 5,794 | - |
| Doctoral Dissertation Research: Exploration of Positively Selected Regions of the Human Genome Shaping Pelvis and Scapula Evolution | 47.075 | BCS-1847979 | | 4,868 | - |
| Doctoral Dissertation Research: Identifying Individuals' Causal Effects (Peer Effects) on Participation in Collective Action | 47.075 | SES-1647325 | | 1,025 | - |
| Doctoral Dissertation Research: Identifying Positively-Selected Introgressed Genetic Variants with Regulatory Effects in Humans | 47.075 | BCS-1847287 | | 13,871 | - |
| Doctoral Dissertation Research: Impacts of dietary fat type on energy gain in the human holobiont | 47.075 | BCS-1919892 | | 32,183 | - |
| Doctoral Dissertation Research: Spatial Inequality in Birth Outcomes - Testing Classes of Proximate Mechanisms | 47.075 | SES-1802538 | | 228 | - |
| Doctoral Dissertation Research: The Cultural Significance of Informal American Commemorative Sites | 47.075 | BCS-1756776 | | 1,628 | - |
| Doctoral Dissertation Research: The Dynamics of Cultural Training in the U.S. Military | 47.075 | BCS-1823432 | | 17,455 | - |
| Doctoral Dissertation Research: The Role of New Data Technologies in the Collaborative Development of Accurate Health Measures | 47.075 | BCS-1917914 | | 17,019 | - |
| Fear and the Safety Net: Evidence from Secure Communities | 47.075 | SES-1849427 | | 92,687 | - |
| FW-HTF-P: Impact of AI Robotics on Labor (AIRL) | 47.075 | SES-1928616 | | 12,000 | - |
| Is Better Access to Information Effective in Improving Labor Market Outcomes Experimental Evidence. | 47.075 | SES-1824465 | | 6,139 | 3,633 |
| Learning-based motivation of intergroup aggression | 47.075 | BCS-1551559 | | 36,296 | - |
| Monetary values of increasing life expectancy: sensitivity to shifts of the survival curve | 47.075 | 1824492 | | 131,518 | - |
| Policing and the Educational Performance of Minority Youth | 47.075 | SES-1850666 | | 64,001 | - |
| Preferences in Matching Market Design | 47.075 | SES-1459912 | | 22,818 | - |
| RAPID: Characterizing El Nino Runoff And Sedimentation in Small Drainage Basins: A Geoarcheological Study | 47.075 | BCS-1611881 | | 1,952 | - |
| RIDIR: Collaborative Research: Bayesian analytical tools to improve survey estimates for subpopulations and small areas | 47.075 | SES-1926424 | | 83,636 | - |
| RIDIR: Collaborative Research: Portal to Data and Analysis Tools: Enabling Data-Intensive Research in the Urban Sciences on Linked, Large-Scale Records | 47.075 | SES-1637136 | | 38,558 | - |
| Standard Research Grant: A Comparitive Study of Three Models of Innovation in Their Transnational Implementation | 47.075 | SES-1457011 | | 55,799 | - |
| Statistical Methods for Causal Inference in Geographic Regression Discontinuity Designs | 47.075 | SES-1461435 | | 17,797 | 1,261 |
| The developmental genetic basis for evolutionary variation in the hominin shoulder | 47.075 | BCS-1518596 | | 3,519 | - |
| The Effects of Sadness Versus Gratitude on Economic Decision Making and Addictive Behavior | 47.075 | SES-1559511 | | 57,471 | - |
| The importance of confidence in predicting labor market outcomes | 47.075 | SES-1713752 | | 5,582 | - |
| Workshop: Historical and Social Perspectives on the Life Sciences Concerning Life and Death: Naples, Italy, June 23-30, 2019 | 47.075 | SES-1921617 | | 16,809 | - |
| **Total for CFDA 47.075** | | | | 1,918,127 | 162,775 |
| Bringing Team-Based, Project-Based Learning to Scale | 47.076 | DUE-1504664 | | 13,619 | 11,245 |
| CAREER: Soft Robotics for Upper Extremity Rehabilitation | 47.076 | CBET-1454472 | | 200,162 | - |
| CAREER:Statistical Modeling of Single Cell States Informative | 47.076 | DBI-1452964 | | 60,518 | - |
| Collaborative Research: A Study of How Pre-College Informal Activities Influence Female Participation in STEM Careers | 47.076 | DRL-1612375 | | 420,553 | 17,469 |
| Collaborative Research: Developing an Online Game to Teach Middle School Students Science Research Practices in the Life Sciences | 47.076 | DRL-1907398 | | 55,460 | - |

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| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Collaborative Research: Embedding Public Engagement with Science at Long-Term Ecological Research Sites | 47.076 | DRL-1713307 | | 162,387 | - |
| Collaborative Research: Innovative Technology-Enabled Astronomy for Middle Schools II (TEAMS II) | 47.076 | DRL-1433431 | | 87,559 | 30,073 |
| Collaborative Research: Leveraging Comparison and Explanation of Multiple Strategies (CEMS) to Improve Algebra Learning | 47.076 | DRL-1561283 | | 120,843 | - |
| Collaborative Research: NCS-FO: Individual variation, plasticity, and learning in human brain evolution | 47.076 | DRL-1941626 | | 176,537 | 88,711 |
| Collaborative Research: Thinking Spatially About the Universe- A Physical and Virtual Model for Middle School Science | 47.076 | DRL-1503395 | | 173,638 | 4,839 |
| Core Systems for Learning Mathematics | 47.076 | DRL-1348140 | | 276,131 | - |
| EcoXPT: Affordances for experimentation in an immersive world to support the learning of ecosystem science and complex causality | 47.076 | DRL-1416781 | | 235,994 | - |
| Effects of ADVANCE in the STEM Disciplines: Faculty Diversity, Women in Leadership, and Institutional Transformation | 47.076 | DGE-1444586 | | 26,349 | 17,626 |
| Getting Unstuck: Designing and Evaluating Teacher Resources to Support Conceptual and Creative Fluency with Programming | 47.076 | DRL-1908110 | | 176,891 | - |
| Graduate Research Fellowship Program | 47.076 | DGE-1745303 | | 9,544,342 | - |
| Integrating Computational Thinking in Ecosystem Science Education via Modeling in Immersive Virtual Worlds | 47.076 | DRL-1639545 | | 438,246 | - |
| IUSE: A Pedagogical Framework for Undergraduate Project-Based Engineering Design Courses | 47.076 | DUE-1524902 | | 25,670 | - |
| MOSART HSLS: Misconceptions Oriented Standards-based Assessment Resource for Teachers of High School Life Science | 47.076 | DRL-1316645 | | 26,491 | - |
| MOSART HSPS: Misconceptions Oriented Standards-Based Assessment Resource for Teachers of High School Physical Sciences | 47.076 | DRL-1621210 | | 613,927 | 34,588 |
| Professional Development Models and Outcomes for Science Teachers (PDMOST) | 47.076 | DRL-1417438 | | 111,990 | 101,141 |
| Reconstructing Research in Teacher Education to Provide Usable Knowledge and Support Teacher Education Improvement | 47.076 | DUE-1920616 | | 69,059 | 1,968 |
| SURVEY OF U.S. MIDDLE SCHOOL MATHEMATICS TEACHERS AND TEACHING | 47.076 | DRL-1417731 | | 102,267 | - |
| The Mathematical Knowledge for Teaching Measures: Refreshing the Item Pool | 47.076 | DRL-1620914 | | 451,504 | 25,117 |
| **Total for CFDA 47.076** | | | | 13,570,137 | 332,777 |
| Convergence Accelerator Phase I: Project Scoping Workshop (PSW) on Quantum Interconnects (QuIC) | 47.083 | OIA-1946564 | | 32,830 | - |
| **Total for CFDA 47.083** | | | | 32,830 | - |
| **Total for National Science Foundation Direct Awards** | | | | 54,161,883 | 5,877,213 |
| **Department of Veterans Affairs** | | | | | |
| MAVERIC Project | 64.RD | 36C24E18D0048-36C24E19N0125 | | 677,419 | - |
| **Total for 64.RD** | | | | 677,419 | - |
| **Total for Department of Veterans Affairs Direct Awards** | | | | 677,419 | - |
| **EPA** | | | | | |
| Disparities in Exposure and Health Effects of Multiple Environmental Stressors Across the Life Course | 66.509 | 83615601 | | 212,061 | 125,435 |
| Effects of Changes in Climate and Land Use on U.S. Dust and Wildfire Particulate Matter | 66.509 | 83587501 | | 101,049 | - |
| Regional Air Pollution Mixtures: The Past and Future Impacts of Emission Controls and Climate Change on Air Quality and Health | 66.509 | 83587201 | | 2,052,368 | 383,147 |
| **Total for CFDA 66.509** | | | | 2,365,478 | 508,582 |
| **Total for EPA Direct Awards** | | | | 2,365,478 | 508,582 |
| **Department of Energy** | | | | | |
| A Lagrangian study of the transition from shallow to deep convection using ASR observations and LES simulations | 81.049 | DE-SC0018120 | | 75,706 | - |
| CATALYST DESIGN FOR SMALL MOLECULE ACTIVIATION OF ENERGY CONSEQUENCE | 81.049 | DE-SC0019144 | | 265,680 | - |
| Correlated Quasiparticles in Graphene | 81.049 | DE-SC0012260 | | 1,378 | - |
| Data Structure Alchemy | 81.049 | DE-SC0020200 | | 125,676 | - |
| Design and Assembly of Atomically-Precise Quantum Materials and Devices | 81.049 | DE-SC0020128 | | 217,138 | - |
| Discovering Dark Matter Clumps and Primordial Particles with Galaxies | 81.049 | DE-SC0020223 | | 114,538 | - |
| Dynamic Self-Assembly, Emergence, and Complexity | 81.049 | DE-FG02-00ER45852 | | 183,393 | - |
| Dynamics of Many-Body Quantum Entanglement | 81.049 | DE-SC0019030 | | 301,927 | - |
| Energy Transductions in Multimodal Stimuli-Responsive Systems with Information Encoding Capabilities and Non-equilibrium Signal Processing | 81.049 | DE-SC0005247 | | 264,021 | 140,573 |
| Exploring New Physics on Cosmological Scales | 81.049 | DE-SC0019018 | | 7,975 | - |
| INTEGRATED MESOSCALE ARCHITECTURES FOR SUSTAINABLE CATALYSIS (IMASC) | 81.049 | DE-SC0012573 | | 2,623,965 | 862,649 |
| Microbial Ecology, Proteogenomics and Computational Optima | 81.049 | DE-FG02-02ER63445 | | 3,669,696 | - |
| Proton-Coupled Electron Transfer Studies of Homogeneous and Heterogeneous Energy Conversion Catalysts | 81.049 | DE-SC0017619 | | 349,795 | - |
| Pursuing Dark Energy with Large Galaxy Redshift Surveys: Baryon Acoustic Oscillations and Beyond | 81.049 | DE-SC0013718 | | 110,924 | - |
| QPress: Quantum Press for Next-Generation Quantum Information Platforms | 81.049 | DE-SC0019300 | | 1,486,705 | 606,914 |
| Quantum Field Theory and Theoretical Particle Physics | 81.049 | DE-SC0013607 | | 378,521 | - |
| Research in High Energy Physics | 81.049 | DE-SC0007881 | | 1,184,809 | - |
| SISGER: Transport and Imaging of Mesoscopic Phenomena in Novel Low-Dimensional Materials | 81.049 | DE-SC0001819 | | 814,349 | 453,219 |
| State-to-State Molecular Reactions in the Ultracold Regime | 81.049 | DE-SC0019020 | | 219,379 | - |
| Theoretical Research in High Energy Physics | 81.049 | DE-SC0007870 | | 158,982 | - |
| Understanding Flow Cell Porous Electrodes as an Active Materials for Electrochemical Transformations | 81.049 | DE-SC0020170 | | 264,031 | - |
| **Total for CFDA 81.049** | | | | 12,818,588 | 2,063,355 |
| From Z to Planets: Phase II | 81.112 | DE-NA0002937 | | 85,036 | 17,326 |
| From Z to Planets: Phase III | 81.112 | DE-NA0003904 | | 106,319 | 16,224 |
| High Pressure Metallic Hydrogen | 81.112 | DE-NA0003346 | | (3,375) | - |
| The Properties of Metallic Hydrogen | 81.112 | DE-NA0003917 | | 139,833 | - |
| **Total for CFDA 81.112** | | | | 327,813 | 33,550 |
| GaN NMR Spectrometer Integrated Circuits Towards Broadly Distributed On-line Monitoring and Management of Subsurface Oil/Gas Reservoirs and Downstream | 81.135 | DE-AR0001063 | | 74,516 | - |
| Mining the deep sea for microbial ethano- and propanogenesis | 81.135 | DE-AR0000963 | | 209,950 | 146,618 |
| **Total for CFDA 81.135** | | | | 284,466 | 146,618 |
| **Total for Department of Energy Direct Awards** | | | | 13,430,867 | 2,243,523 |
| **Department of Education** | | | | | |
| Core Academic Language Skills Instrument: Refining the assessment to measure and monitor English Learners' progress | 84.305 | R305A190034 | | 160,217 | 15,482 |
| Partnering in Education Research (PIER): A Predoctoral Interdisciplinary Training Program | 84.305 | R305B150010-16 | | 795,496 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Student Outcomes of Integrative Mental Health Services | 84.305 | R305A140253-16 | | 419,145 | 11,680 |
| **Total for CFDA 84.305** | | | | 1,374,858 | 27,162 |
| Digital Messaging for Improving College Enrollment and Success | 84.305A | R305A140121-17 | | 41,325 | 41,325 |
| The language of written argumentation and explanation: Individual developmental trajectories from 4th to 8th grade | 84.305A | R305A170185 - 18 | | 112,328 | 56,101 |
| **Total for CFDA 84.305A** | | | | 153,653 | 97,426 |
| National Center on Rural Education Research Networks | 84.305C | R305C190004 | | 1,144,499 | 57,341 |
| **Total for CFDA 84.305C** | | | | 1,144,499 | 57,341 |
| Understanding and Measuring Treatment Effect Heterogeneity in Large Scale Experiments and Pseudo-Experiments in Education | 84.305D | R305D150040-17 | | 66,140 | 58,461 |
| **Total for CFDA 84.305D** | | | | 66,140 | 58,461 |
| **Total for Department of Education Direct Awards** | | | | 2,739,150 | 240,390 |
| **Millennium Challenge Corporation** | | | | | |
| Growth Diagnostics: Building New Methods to Identify and Address Constraints to Accelerate Growth | 85.002 | 95332418T0020 | | 49,645 | - |
| **Total for CFDA 85.002** | | | | 49,645 | - |
| **Total for Millennium Challenge Corporation Direct Awards** | | | | 49,645 | - |
| **DHHS** | | | | | |
| Impact Evaluation of Combination HIV Prevention Interventions in Botswana | 93.067 | 5U2GGH001911-05 | | 339,442 | 92,859 |
| **Total for CFDA 93.067** | | | | 339,442 | 92,859 |
| E-Cigarette Vaping in Advertising Portrayals and Behavioral Outcomes Research (E-VAPOR Study) | 93.077 | 5R03CA212544-02REV | | 3,515 | - |
| **Total for CFDA 93.077** | | | | 3,515 | - |
| Image Forensics: Manipulation-Robust Image Duplicate Identification | 93.085 | 1 ORIIR180043-01-01 | | (70) | - |
| Image Forensics: Quantitative Assessments of Image Duplication | 93.085 | 1 ORIIR190048-01-00 | | 145,432 | - |
| **Total for CFDA 93.085** | | | | 145,362 | - |
| Scaffolds mimicking antigen presenting cells | 93.103 | 5R01FD006589-02 REVISED | | 563,047 | - |
| **Total for CFDA 93.103** | | | | 563,047 | - |
| Epidemiological MCH/SPH Institute | 93.110 | 6T03MC07648-12-05 | | 27,954 | - |
| Training Grant in Maternal and Child Health | 93.110 | 5T76MC00001 | | 350,021 | - |
| Training Grant in Maternal and Child Health | 93.110 | 6T76MC00001-65-01 | | 12,945 | - |
| **Total for CFDA 93.110** | | | | 390,920 | - |
| A big data approach to phthalates, hormones, and ADHD | 93.113 | 5R21ES028900-02 | | 193,024 | 6,000 |
| A randomized, controlled behavioral nutrition intervention to reduce pesticide exposures and improve cardio-metabolic health | 93.113 | 1K01ES031613-01 REVISED | | 16,464 | - |
| Air Particulate, Metals, and Cognitive Performance in an Aging Cohort- Roles of Circulating Extracellular Vesicles and Non-coding RNAs | 93.113 | 5R01ES027747-03 | | 534,806 | 198,607 |
| Air Pollution and Autism in Israel: A Population-Wide Study | 93.113 | 5R21ES026900-02 | | 22,433 | 4,514 |
| Cardiovascular Health and Air Pollution: A National Study | 93.113 | 5R01ES024332-04REVISED | | 267,970 | 31,833 |
| Data-Driven identification of environmental factors in cardiovascular diseaase | 93.113 | 5R00ES023504-05 | | 3,395 | - |
| Early and late-life metal exposures and Alzheimer's disease | 93.113 | 5R01ES024165-05 | | 479,707 | 154,192 |
| Effects of Environmental Phthalates and Chemical Mixtures on Male Puberty and Semen Quality | 93.113 | 5R01ES014370-14 | | 415,254 | 154,979 |
| Engineered Nanomaterial Synthesis, Characterization and Method Development Center for Nano-safety Research | 93.113 | 3U24ES026946-04S1 | | 807,425 | 180,900 |
| Environmental Obesogens and Weight Change in the POUNDS LOST Trial | 93.113 | 2R01ES022981-05A1 | | 6,865 | - |
| Glucose Metabolism in Adults Prenatally Exposed to Diabetogenic Pollutants | 93.113 | 5R01ES021477-05 REVISED | | 67,785 | 67,785 |
| Graduate Training in Biostatistics | 93.113 | 2532ES007142-37 | | 397,647 | - |
| Graduate Training in Biostatistics | 93.113 | 5T32ES007142-35Revised | | 512 | - |
| Gut Microbiome in Adults with Early Life Exposures to Environmental Chemicals | 93.113 | 5R21ES023376-03Revised | | 149,615 | - |
| Harvard Chan School NIEHS Center for Environmental Health | 93.113 | 2P30ES000002-56 | | (68,780) | - |
| Harvard Chan School NIEHS Center for Environmental Health | 93.113 | 2P30ES000002-56 | | 1,239,558 | 25,071 |
| HSPH NIEHS Center for Environmental Health | 93.113 | 5P30ES000002-55 | | 19,041 | - |
| Human Exposure to Bisphenol A, Phthalates and Fertility, Pregnancy Outcomes | 93.113 | 5R01ES009718-20 | | 144,556 | - |
| Immunotoxicity in Humans with Lifetime Exposure to Ocean Pollutants | 93.113 | 4R01ES021993-05REVISED | | 3,645 | 3,645 |
| Impact of Obesity on Airway Responses to Air Pollution | 93.113 | 5R01ES013307-15REVISED | | 241,712 | 37,039 |
| Inflammation and metabolic abnormalities in pollutant-exposed children | 93.113 | 5R01ES026596-02 | | 125,604 | 93,121 |
| Interdisciplinary Training in Genes and the Environment | 93.113 | 5T32ES016645-10Rev | | 426,216 | - |
| Manganese Transport and Toxicity | 93.113 | 2R56ES014638-13REVISED | | 29,124 | - |
| Maternal and Paternal Flame Retardant Exposure, Impact on Fertility and Pregnancy | 93.113 | 5R01ES022955-05 | | 116,171 | 26,384 |
| Maternal and Paternal Preconception Environmental Exposures and Children's Health | 93.113 | 5R01ES027408-03 | | 645,811 | 135,612 |
| MicroRNAs, ER stress, and arsenic neurotoxicity | 93.113 | 1K99ES029548-01A1 | | 65,575 | - |
| Multi-Pathway DNA Repair Capacity Measurements in Lung Cancer Patients and Healthy Controls | 93.113 | 5U01ES029520-02REVISED | | 581,247 | 123,646 |
| New Tools for the interpretation of Pathogen Genomic Data with a focus on Mycobacterium tuberculosis | 93.113 | 5K01ES026835-06 | | 239,632 | - |
| Novel markers of exposure and pathways of response to Chromium | 93.113 | 5R01ES027981-03 | | 552,029 | 18,068 |
| Nurses Health Study 3: A multiple exposure environmental epidemiology cohort of young adults | 93.113 | 5R24ES028521-02 | | 371,177 | 123,347 |
| PCA-based selection scans in very large samples | 93.113 | 5R03ES027902-02 | | 73,055 | - |
| Phthalates, Gestational Diabetes, and Markers of Type 2 Diabetes Risk in Women | 93.113 | 5R01ES026166-04Rev | | 680,205 | 276,024 |
| Placenta-on-a-Chip for Engineered Nanomaterial Toxicity Screening | 93.113 | 3U01ES027272-04S1 | | 547,821 | - |
| Pollutant-related diabetes in the Nurses' Health Study II | 93.113 | 5R01ES021372-05 | | (270) | (270) |
| Relationship Between Multiple Environmental Exposures and CVD Incidence and Survival: Vulnerability and Susceptibility | 93.113 | 5R01ES028033-03 | | 623,746 | 303,356 |
| Retrospective assessment of radon progeny and pollution effects in COPD | 93.113 | 1R21ES029637-01A1 | | 136,654 | 17,977 |
| SPP1, Oxidative Stress, and Lead Toxicity | 93.113 | 5R01ES029097-02 | | 726,560 | 310,374 |
| The Impact of Maternal and Paternal Preconception Perfluoroalkyl Substance (PFAS) Exposure on Reproductive and Perinatal Outcomes | 93.113 | 1R01ES031657-01 | | 8,361 | - |
| The role of UV-induced neoantigens and exogenous neoepitopes in enhancing response to immune checkpoint blockade in melanoma and other cancers. | 93.113 | 5F30ES028995-02 | | 47,988 | - |
| Training Program in Environmental Epidemiology | 93.113 | 5T32ES007069-40 | | 571,584 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Vulnerability During Infancy to Immunotoxic Contaminant Exposures | 93.113 | 1R01ES030394-01A1 | | 13,266 | - |
| **Total for CFDA 93.113** | | | | 11,524,190 | 2,292,204 |
| Anti-Inflammatory Mesenchymal Stem Cell Therapy for Dental Applications | 93.121 | 5K08DE025292-04 | | 115,765 | - |
| Biology of cortical bone of long bones and calvarium Role of Sfrp4 in periosteal bone formation | 93.121 | 1R01DE029615-01 | | 29,181 | - |
| Biology of cortical bone of long bones and calvarium: Role of Sfrp4 in the local regulation of Wnt signaling. | 93.121 | 1R56DE028299-01A1 | | 196,154 | - |
| Chemical Approaches to Rescue Human Mitochondrial Disease Mutations | 93.121 | 5F30DE028206-02 REVISED | | 23,901 | - |
| Dynamics of the bacterial type IX secretion system and its effect on subgingival biofilm formation by bacteria of the human oral microbiome | 93.121 | 5K99DE026826-02 REVISED | | 7,969 | - |
| Engineering Skeletal Muscle With Biodegradable Hydrogels | 93.121 | 5R01DE013349-18 | | 831,738 | - |
| Gas-Hedgehog signaling in intramembranous bone formation and expansion | 93.121 | 5R01DE025866-04 | | 535,962 | - |
| Multivariate Bayesian variable selection for high-dimensional oral microbiome data | 93.121 | 7R03DE027486-02 | | 67,149 | 27,214 |
| Nicotinamide Mononucleotide (NMN) as a Novel Therapeutic in the Treatment of Oral Mucositis | 93.121 | 1R21DE027490-02 REVISED | | 239,109 | - |
| Polymeric Matrices With Defined Cell Adhesion | 93.121 | 5R01DE013033-21 | | 215,072 | - |
| Probing the cAMP signaling microdomain of the primary cilium | 93.121 | 5R21DE025921-02 REVISED | | 13,246 | - |
| Regulation of Inflammation in T2D-Associated Periodontitis. | 93.121 | 5R00DE024575-04 | | 258,485 | - |
| Targeting the source: bacterial specific pain mechanisms in dental pulp | 93.121 | 7R56DE027368-02 | | 128,192 | - |
| Tooth Movement derived by PDL Cellular Manipulations | 93.121 | 5R00DE025053-04 | | 320,468 | - |
| **Total for CFDA 93.121** | | | | 2,982,391 | 27,214 |
| Health Promotion and Disease Prevention Research Centers | 93.135 | 6U48DP006376-01M003 | | 357,263 | - |
| **Total for CFDA 93.135** | | | | 357,263 | - |
| Safety and Health Management of Hazards Associated with Emerging Technologies. | 93.143 | 5R25ES023635-07 | | 73,411 | 7,440 |
| Metals and Metal Mixtures: Cognitive Aging, Remediation and Exposure Sources (MEMCARE) | 93.143 | 1P42ES030990-01 | | 100,320 | - |
| **Total for CFDA 93.143** | | | | 173,731 | 7,440 |
| Center for Genomically Engineered Organs | 93.172 | 3RM1HG008525-05S1 | | 1,546,287 | 206,459 |
| Computational methods to advance from genetic association to biological insight | 93.172 | 5F31HG009850-03 REVISED | | 22,173 | - |
| Coordinating Center for the Undiagnosed Disease Network Phase II | 93.172 | 5U01HG007530-06 REVISED | | 3,767,797 | 1,168,615 |
| Fast and accurate phasing using the positional Burrows-Wheeler transform (PBWT) | 93.172 | 5R21HG009513-02 | | 171,972 | - |
| FLYBASE: A DROSOPHILA GENOMIC AND GENETIC DATABASE | 93.172 | 5U41HG000739-27 REVISED | | 3,590,829 | 1,399,881 |
| From common to rare variant functional architectures of human diseases | 93.172 | 5K99HG010160-02 | | 89,221 | - |
| Functionally specialized components of disease heritability in ENCODE data | 93.172 | 5U01HG009379-04 | | 496,825 | 245,179 |
| Global measurement of splicing kinetics | 93.172 | 5R21HG009264-02 | | (697) | - |
| HMMER and Infernal: Finding distant homologs of sequences and RNA structures | 93.172 | 5R01HG009116-04 | | 362,045 | - |
| Identifying genetic code reassignments in nucleotide sequence databases | 93.172 | 1F31HG010984-01 | | 15,573 | - |
| Identifying Genome-scale Interaction Effects in Human Traits and Diseases | 93.172 | 5R21HG007687-02REVISED | | (496) | (496) |
| Large-Scale High-Confidence Binary Protein Interaction Network for Drosophila | 93.172 | 5R01HG007118-05 | | (987) | (987) |
| Leveraging histone modification heritability to understand complex disease genetics | 93.172 | 5F32HG009615-03 | | 39,499 | - |
| Leveraging molecular QTL to understand the genetic architecture of disease | 93.172 | 5F32HG009987-02 REVISED | | 14,517 | - |
| Leveraging Tissue-Specific Regulatory Grammar to Interpret Human Evolution and Non-coding Variation | 93.172 | 5F32HG009226-03 REVISED | | 11,417 | - |
| Mechanisms of Transcriptional Control Revealed by Nascent Transcript Sequencing | 93.172 | 5R01HG007173-07 | | 682,848 | - |
| Methods for disease mapping in multi-ethnic populations | 93.172 | 5R01HG006399-08 | | 520,428 | 266,305 |
| Pathway Commons: Research Resource for Biological Pathways | 93.172 | 5U41HG006623-07 REVISED | | 24,174 | 20,389 |
| Patient-Centered Information Commons (PIC) | 93.172 | 5U54HG007963-05 REVISED | | 1,094,119 | - |
| PFinder: A computational tool to identify genomic regions affected by perturbation | 93.172 | 1F31HG010570-01 | | 28,058 | - |
| Population-Based Approaches to Genome Structure and Structural Variation | 93.172 | 5R01HG006855-08 | | 779,993 | - |
| Powering whole genome sequence-based genetic discovery for common human diseases | 93.172 | 5U01HG009088-04S1 | | 947,504 | 510,494 |
| Pragmatic randomized trial of polygenic risk scoring for common diseases in primary care | 93.172 | 1R35HG010706-01 REVISED | | 154,307 | - |
| Preparing Association Analysis Software Tools for Next Generation Sequencing Data | 93.172 | 5R01HG008976-03 | | 199,199 | 4,939 |
| Systematic Exploration of the Human Interactome III | 93.172 | 5U24HG006673-08 | | 726,489 | - |
| Training in Bioinformatics and Integrative Genomics | 93.172 | 5T32HG002295-15 REVISED | | 12,876 | - |
| Training in Bioinformatics and Integrative Genomics | 93.172 | 5T32HG002295-17 REVISED | | 739,947 | - |
| Visualization of (Epi)Genomic Data for Discovery of Disease-Associated Variants | 93.172 | 5R00HG007583-05 REVISED | | (1,596) | - |
| **Total for CFDA 93.172** | | | | 16,034,321 | 3,820,778 |
| Characterizing the Functional Architecture of the Necklace Olfactory System | 93.173 | 5R01DC016222-03 | | 350,446 | - |
| Afferent-efferent interactions in the developing cochlea | 93.173 | 5R01DC015974-04 REVISED | | 472,203 | - |
| Atomic Structure of Sensory Transduction Proteins | 93.173 | 5F32DC016210-03 REVISED | | (706) | - |
| Binding of PCDH15 to TMC1 for Mechanosensation in the Inner Ear | 93.173 | 1F32DC018713-01 | | 14,535 | - |
| Cortical feedback and olfactory processing | 93.173 | 5R01DC016289-03 | | 338,035 | - |
| Development of computational models to diagnose mechanical lesions of the ear | 93.173 | 5F31DC016761-02 | | 6,081 | - |
| Dissecting sensory to motor transformations in Drosophila melanogaster | 93.173 | 5F31DC015701-03 | | 15,497 | - |
| Diversification of spiral ganglion neurons during development and in maturity | 93.173 | 1R21DC018356-01 | | 67,610 | - |
| Emergence of valence coding in the ventral striatum | 93.173 | 5R01DC017311-02 | | 718,617 | - |
| Force Dependent Unbinding of Mammalian Inner Ear Tip Link Proteins | 93.173 | 5F31DC016199-03 | | 22,722 | - |
| Gene Therapy for Hearing and Balance Disorders | 93.173 | 5R01DC016932-02 | | 591,193 | 70,317 |
| Genetic Dissection of Auditory Circuit Assembly | 93.173 | 2R01DC009223-11 | | 218,785 | - |
| Genetic Dissection of Auditory Circuit Assembly | 93.173 | 5R01DC009223-10 | | 396,825 | - |
| Harnessing Otic Progenitor Cells Derived From Many Donors to Test for Cisplatin Associated Hearing Loss | 93.173 | 1R21DC018092-01 | | 121,512 | - |
| Individual and population differences in the representation of harmonic sounds | 93.173 | 1F31DC018433-01 REVISED | | 17,565 | - |
| Information Coding in Individual Olfactory Sensory Axons | 93.173 | 5F32DC015938-03 REVISED | | 32,224 | - |
| Learning-mediated plasticity in cortical feedback projections to the olfactory bulb | 93.173 | 1K99DC017754-01A1 | | 57,960 | - |
| Mechanisms of Hair Cell Mechanotransduction Channel Gating | 93.173 | 1R21DC018631-01 | | 36,722 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Molecular Basis of Inherited Deafness | 93.173 | 5R01DC002281-21 | | 104,809 | 22,752 |
| Molecular Mechanisms of Auditory Transduction | 93.173 | 5R01DC000304-35 | | 558,640 | 43,418 |
| Morphological and Molecular Development of Efferent Innervation of the Cochlea | 93.173 | 1F32DC019009-01 | | 5,311 | - |
| Neuromodulation of sensory processing by the serotonin system | 93.173 | 5R01DC014453-05 | | 110,109 | - |
| Olfactory circuits that control behavior | 93.173 | 5R01DC013289-05 REVISED | | 24,282 | - |
| Olfactory tubercle circuits involved in odor valence assignment | 93.173 | 1F32DC017891-01 | | 61,032 | - |
| Spatial and sensorimotor encoding for goal-directed navigation | 93.173 | 5F30DC017698-02 REVISED | | 30,529 | - |
| Synaptic and Circuit Mechanisms of Olfactory Processing | 93.173 | 5R01DC008174-13 | | 267,437 | - |
| Synaptic and Functional Changes in Cochlear and Vestibular Hair Cells of Tmc Mutant Mice | 93.173 | 1F32DC018233-01 | | 65,701 | - |
| The mechanism of inner ear pressure homeostasis by the endolymphatic sac | 93.173 | 5R01DC015478-04 | | 435,626 | - |
| The role of inhibition in higher olfactory processing | 93.173 | 5F31DC016471-03 | | 32,153 | - |
| Training for Speech and Hearing Sciences | 93.173 | 5T32DC000038-28 REVISED | | 676,524 | - |
| Transcriptional diversity in olfactory sensory neurons | 93.173 | 1F31DC019017-01 REVISED | | 2,110 | - |
| What Causes Hearing Loss: Advancing the Methods | 93.173 | 1R01DC017717-01A1 | | 106,977 | 30,580 |
| Why are interneurons within the same brain region so diverse | 93.173 | 5F31DC016196-03 | | 32,071 | - |
| **Total for CFDA 93.173** | | | | 5,991,137 | 167,067 |
| Sensory receptors of the vagus nerve | 93.212 | 5DP1AT009497-04 | | 1,090,673 | - |
| **Total for CFDA 93.212** | | | | 1,090,673 | - |
| 2020 Research Day on Teaching Kitchens and Self Care Practices | 93.213 | 1R13AT010554-01 | | 30,327 | - |
| Chemical biology of bacterial symbionts | 93.213 | 5R01AT009874-11 | | 371,188 | - |
| Identification and characterization of gut microbial bioactive molecules that determine predisposition to autoimmune disease and atopy | 93.213 | 5R01AT009708-03 | | 808,686 | 304,880 |
| Inequities in Health Outcomes in the Twenty-First Century: Understanding New Causes and the Impact of Delivery System Reforms on Health Care Disparities | 93.213 | 5DP5OD024564-03 | | 467,798 | - |
| Mining the Gut Microbial Metabolome for Immunomodulatory Molecules that Contribute to Health or Disease | 93.213 | 1F32AT010415-01A1 | | 10,202 | - |
| Sensory Neuron-Bacteria Interactions in Modulating Pain and the Host Microbiota | 93.213 | 3DP2AT009499-01S1 | | 454,539 | - |
| **Total for CFDA 93.213** | | | | 2,142,740 | 304,880 |
| Comparing Targeted and Non-Targeted Approaches to Improving the Value of Cancer Care Services | 93.226 | 1R01HS026498-01 | | 252,590 | 25,938 |
| Engineering highly reliable learning lab | 93.226 | 5P30HS024453-04 REVISED | | 711,327 | 521,018 |
| Health Policy Training Program | 93.226 | 5T32HS000055-26 | | 407,896 | - |
| Identifying Predictors of Hospital Admission from the ED Among the Elderly | 93.226 | 5R01HS025408-03 | | 412,452 | 113,014 |
| Prescribing of opioids at hospital discharge and associated adverse patient outcomes | 93.226 | 1R01HS026753-01A1 REVISED | | 73,133 | - |
| Quality and Outcomes under Medicaid Managed Care: Evidence from Random Plan Assignment | 93.226 | 5K01HS025786-02 | | 141,018 | - |
| R18 Closed Loop Diagnostics : AHRQ R18 Patient Safety Learning Laboratories | 93.226 | 1R18HS027282-01 | | 115,502 | - |
| Risk Aversion, Fear of Malpractice, and Medical Decision Making in the Emergency Department | 93.226 | 1R01HS026730-01A1 REVISED | | 17,862 | - |
| Strategic Behavior Among Provider Organizations in Risk-Sharing Contracts | 93.226 | 1R36HS027531-01 | | 8,440 | - |
| **Total for CFDA 93.226** | | | | 2,140,220 | 659,970 |
| A General Approach for the Development of New Cell-Type-Specific Viral Vectors | 93.242 | 1RF1MH114081-01 | | 684,328 | - |
| A novel output pathway from the cerebellum for regulation of diverse non-motor behaviors | 93.242 | 1R01MH122570-01 | | 88,830 | - |
| Basal forebrain parvalbumin neurons regulate attention by controlling cortical oscillations | 93.242 | 1F32MH119838-01A1 | | 4,633 | - |
| Basal forebrain purinergic P2 receptor mechanisms of sleep-wake regulation | 93.242 | 5R03MH107650-02 REVISED | | 18,603 | - |
| Biological/behavioral rhythms and suicidal behavior: A real-time monitoring study | 93.242 | 1K23MH120439-01A1 | | 31,703 | - |
| Brain-wide correlation of single-cell firing properties to patterns of gene expression | 93.242 | 1RF1MH117042-01 | | 516,407 | - |
| Cerebellar network mapping with a high-throughput TEM platform | 93.242 | 1RF1MH114047-01 | | 295,308 | - |
| Child Trauma and the Development of Neural Systems Underlying Emotion Regulation | 93.242 | 7R01MH103291-05 | | 358,226 | 12,596 |
| Context dependent modulations of dopamine signaling | 93.242 | 5R01MH110404-04 | | 319,020 | - |
| CRCNS: Leveraging decision-making variability to identify underlying computations | 93.242 | 5R01MH115554-03 | | 161,483 | - |
| Decision-making and suicidal behavior | 93.242 | 5F31MH116649-02 | | 30,322 | - |
| Deprivation and Threat: Dimensions of Early Experience and Neural Development | 93.242 | 5R01MH106482-05 REVISED | | 430,135 | 64,264 |
| Developmental origins of mental illness: evolution and reversibility | 93.242 | 5P50MH094271-07 | | 2,356,204 | 439,931 |
| Dissecting the assembly of vertebrate neurotransmitter release sites | 93.242 | 5R01MH113349-04 | | 586,641 | - |
| ESSENCE (Enabling translation of Science to Service to ENhance Depression CarE) | 93.242 | 5U19MH113211-03 REVISED | | 819,047 | 486,125 |
| Event-related Neuroimaging of Human Memory Formation | 93.242 | 5R01MH060941-19 | | 269,184 | - |
| Exploring a Novel Paradigm of Schizophrenia and Bipolar Disorder | 93.242 | 5R01MH113279-04 | | 1,321,282 | - |
| Functional analysis of schizophrenia-associated genes | 93.242 | 5K99MH110603-02 REVISED | | 12,615 | - |
| Functional Roles of Long Noncoding RNAs During Neuronal Development | 93.242 | 5R01MH102416-05 REVISED | | 213,133 | - |
| Genomic mechanisms of firing rate homeostasis | 93.242 | 5R01MH116223-03 | | 243,194 | - |
| Health Policy Training Program: Promoting Outcomes, Quality, and Diffusion of Medical Advances | 93.242 | 5T32MH019733-25 | | 299,319 | - |
| Identifying Risk Factors for PTSD by Pooled Analysis of Current Prospective Studies | 93.242 | 7R01MH101227-02Revised | | 33,846 | 33,846 |
| Impact of Telemedicine on Medicare Beneficiaries with Mental Illness | 93.242 | 5R01MH112829-03 | | 798,866 | 130,817 |
| In situ transcriptional analysis of brain circuits at single cell resolution | 93.242 | 5R01MH111502-03 | | 313,561 | 140,060 |
| In situ transcriptome imaging in single cells | 93.242 | 5R01MH113094-04 | | 880,744 | - |
| Intensive longitudinal study of suicidal behaviors and related health outcomes | 93.242 | 5U01MH116928-02 | | 911,473 | 152,441 |
| Intercellular TWEAK/Fn14 Cytokine Signaling in Sensory-Dependent Circuit Refinement | 93.242 | 5K99MH120051-02 | | 130,652 | - |
| Leveraging EHR data to evaluate key treatment decisions to prevent suiciderelated behaviors | 93.242 | 1R01MH121478-01 REVISED | | 199,911 | 5,403 |
| Modeling ASD-linked genetic mutations in 3D human brain organoids | 93.242 | 5R01MH112940-03 | | 313,226 | 121,437 |
| Molecular, spatial, and functional development of innate behavior in the periaqueductal gray | 93.242 | 1F31MH120911-01 | | 32,970 | - |
| Neurodevelopmental Mechanisms Underlying Stress Vulnerability during Adolescence | 93.242 | 1R56MH119194-01 | | 978,734 | - |
| Neuropsychiatric Genome-Scale and RDOC Individualized Domains (N-GRID) | 93.242 | 5P50MH106933-05 REVISED | | 1,058,000 | 59,862 |
| New approaches to understand neuronal microcircuit dynamics for working memory | 93.242 | 5R01MH107620-05 REVISED | | 225,679 | - |
| Non-invasive targeted neuromodulation via focused ultrasound BBB permeabilization | 93.242 | 5R01MH116858-02 | | 629,927 | 285,727 |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Optical measurement of causal functional connectivity in posterior parietal cortex | 93.242 | 5F32MH118698-02 | | 60,422 | - |
| Pathogenic mechanisms in post-bereavement psychopathology: Contributions of gene-environment interplay, psychosocial factors, and cognitive ability in two population-based cohorts | 93.242 | 1K23MH117278-01A1 | | 166,352 | - |
| Ph.D. Training in Neuroscience | 93.242 | 5T32MH020017-22 | | 668,255 | - |
| Post Traumatic Stress Disorder and Accelerated Aging in Women | 93.242 | 5R01MH101269-06 | | 739,553 | 422,075 |
| Pregnancy influences maternal immune cell function and fetal brain development | 93.242 | 1R01MH119459-01A1 REVISED | | 596,872 | - |
| Real-time fMRI Neurofeedback as a Tool to Mitigate Auditory Hallucinations in Patients with Schizophrenia | 93.242 | 5R61MH113751-02 | | 446,138 | 191,319 |
| Regional and Genetic Diversity of Cortical Interneurons | 93.242 | 5R01MH071679-12 | | 1,120,837 | 356,937 |
| Regulation of Neuronal Calcium Dynamics and Learning by Mental Disease-Associated miRNAs | 93.242 | 1R21MH117386-02 | | 222,020 | - |
| Synaptic Basis of Sleep Cycle Control | 93.242 | 5R01MH039683-32 REVISED | | 169,668 | - |
| Temporal Specification of Basal Forebrain Circuitry | 93.242 | 1R01MH119156-01A1 | | 69,961 | - |
| Temporal Specification of Basal Forebrain Circuitry | 93.242 | 1R56MH119156-01 | | 296,257 | - |
| The Brain Wiring of Frontostriatal Connections in Early Psychosis | 93.242 | 1R21MH121704-01 REVISED | | 52,349 | 6,897 |
| Tools to broaden access to high-throughput functional connectomics | 93.242 | 1RF1MH117808-01A1 | | 372,482 | 92,147 |
| Training Program in Psychiatric Genetics and Translational Research | 93.242 | 5T32MH017119-33 | | 320,905 | - |
| VENTRICLES, CORPUS CALLOSUM, SYMPTOMS and MIR137 IN LARGE N STUDY OF SCHIZOPHRENIA | 93.242 | 5R21MH109819-02 REVISED | | 58,055 | - |
| **Total for CFDA 93.242** | | | | 20,927,332 | 3,001,884 |
| A Novel portable KXRF measurement system for in vivo metal measurements | 93.262 | 1K01OH011648-01 | | 58,571 | - |
| Lung Disease in Chinese Textile Workers | 93.262 | 6R01OH002421-22M001 | | (18,160) | - |
| Lung Disease in Chinese Textile Workers | 93.262 | 6R01OH002421-23M001 | | 686,080 | 134,156 |
| The Harvard TH Chan School of Public Health Center for Work, Health and Wellbeing | 93.262 | 5U19OH008861-13-00 | | 1,021,169 | 738,583 |
| The HSPH Education and Research Center of Occupational Safety and Health | 93.262 | 6T42OH008416-13-02 | | (10,100) | - |
| The HSPH Education and Research Center of Occupational Safety and Health | 93.262 | 6T42OH008416-15-01 | | 1,946,765 | 28,355 |
| **Total for CFDA 93.262** | | | | 3,684,325 | 901,094 |
| Alcohol and Breast Cancer: Genetic Interactions and Effects on Aromatase Inhibitor Therapy | 93.273 | 1K01AA027831-01 | | 102,009 | - |
| Alcohol and Cell Adhesion | 93.273 | 4R01AA012974-15 REVISED | | 34,124 | - |
| Chronic disease risk and genetic risk factors in fetal alcohol spectrum disorder | 93.273 | 5F31AA025254-02 | | 4,054 | - |
| Data-Based Methods for Just-In-Time Adaptive Interventions in Alcohol Use | 93.273 | 5R01AA023187-05 | | 535,760 | - |
| Mechanisms of Hippo signaling in Alcoholic liver disease | 93.273 | 5R21AA025725-02 | | (3,099) | - |
| **Total for CFDA 93.273** | | | | 672,848 | - |
| Developmental gene networks of 5HT neurons in addiction, aggression, and anxiety | 93.279 | 5R01DA034022-05 REVISED | | 199,086 | - |
| Next Generation Cell-Type-Specific Viral Vectors for Non-Neuronal Brain Cell Types | 93.279 | 1RF1DA048787-01 | | 464,068 | - |
| Precision pharmacology of the opioids | 93.279 | 5DP1DA046586-02 | | 483,339 | - |
| Stress, Arousal and Mood: Affective Influences on Decisions under Uncertainty | 93.279 | 7R01DA042855-03 | | 354,374 | 1,433 |
| Syringe Injectable Electronics Platform for Chronic Mapping and Modulation of Neural Circuits in Addiction | 93.279 | 3R21DA043985-02S1 REVISED | | 12,461 | - |
| Telemedicine for Treatment of Opioid Use Disorder | 93.279 | 1R01DA048533-01A1 | | 678,182 | 26,824 |
| Validated tools for identifying, characterizing, and targeting all non-neuronal cells in the brain and determining the neuro-glio-vascular connectome | 93.279 | 1RF1DA048786-01 | | 649,629 | - |
| Young Adults Responses to E-Cigarette Advertisement Features and the Effect of Restricting Features on Tobacco Use | 93.279 | 7K99DA046563-02 | | 76,595 | - |
| **Total for CFDA 93.279** | | | | 2,917,734 | 28,257 |
| In vivo Handheld Coherent Raman Scattering (CRS) Microscopy for Glioma Imaging | 93.286 | 5R01EB017254-05 | | 215,264 | 215,264 |
| Mechanotransduction analysis in a microengineered lung-on-a-chip | 93.286 | 5R01EB020004-04 REVISED | | 18,478 | 18,478 |
| MSC Encapsulation with Thin Gel Coating | 93.286 | 5R01EB023287-03 | | 554,650 | 220,293 |
| **Total for CFDA 93.286** | | | | 788,392 | 454,035 |
| Advancing novel methods to measure and analyze multiple types of discrimination for population health research | 93.307 | 1R01MD012793-01A1 | | 522,961 | 64,434 |
| Disparities in Exposure and Health Effects of Multiple Environmental Stressors Across the Life Course | 93.307 | 5P50MD010428-05 | | 576,546 | 372,738 |
| DNA methylation and adversity: pathways from exposures to health inequities | 93.307 | 1R01MD014304-01 | | 207,454 | 97,021 |
| Health Reform and Oral Health Disparities: a Mixed Methods Evaluation | 93.307 | 5K99MD012253-02 | | 124,548 | - |
| Trends in Racial Disparities in Surgical Readmissions and Strategies to Narrow the Gap | 93.307 | 5R21MD011701-02REVISED | | 170,075 | 27,379 |
| Work Requirements and Health Care Disparities in Medicaid: A Randomized Controlled Trial | 93.307 | 1R01MD014970-01 | | 55,997 | 8,716 |
| **Total for CFDA 93.307** | | | | 1,657,581 | 570,288 |
| Antibody therapeutics for human viral hemorrhagic fevers and prevention of late neurological syndromes | 93.310 | 5DP5OD023084-04 | | 423,684 | - |
| Deconvolution and reconstruction of immune histories to enhance infectious disease prevention and vaccination strategies and optimize surveillance efforts | 93.310 | 1DP5OD028145-01 | | 34,657 | - |
| Dissecting bacterial cell wall synthesis using in vivo single molecule tracking | 93.310 | 1DP2AI117923-01 | | 1,819 | - |
| Exploring the unknown protein universe using evolutionary information | 93.310 | 5DP5OD026389-02 | | 341,419 | - |
| High-throughput single-molecule protein identification via super-resolution imaging | 93.310 | 5DP1GM133052-02 | | 1,078,453 | - |
| High-Throughput, Highly Multiplexed In Situ Proteomic Imaging of Human Tissues | 93.310 | 5UG3HL145600-02 REVISED | | 547,961 | - |
| HuBMAP HIVE Tools Component | 93.310 | 3OT2OD026677-01S2 | | 644,787 | - |
| Investigating Organ Formation and the Emergence of Complexity in the Visual System Using Comparative Developmental Approaches | 93.310 | 5DP5OD023111-04 | | 496,733 | - |
| Leveraging Single-Cell Analysis to Elucidate Mechanisms of Vertebrate Limb Regeneration | 93.310 | 7DP2HD087953-02 | | 393,259 | - |
| Machine Learning for Health Outcomes and Quality of Care in Low-Income Populations | 93.310 | 1DP2MD012722-01 | | 325,504 | - |
| Mechanisms of arousal threshold and sleep homeostasis | 93.310 | 1DP2AT009498-01 REVISED | | 422,881 | - |
| Molecular Causes of Down Syndrome Associated Congenital Heart Disease and Other Phenotypes | 93.310 | 1R01HL151257-01 REVISED | | 290,269 | - |
| Molecular determinants of neuronal protein homeostasis through plasma membrane-localized proteasome complexes. | 93.310 | 1DP5OD028133-01 REVISED | | 132,408 | - |
| Molecular mechanisms of adiponectin signaling and PAQR function | 93.310 | 5DP5OD021345-05 | | 500,654 | - |
| New tools for understanding the blood brain barrier | 93.310 | 5DP1NS092473-05 | | 506,629 | - |
| Pharmaco Response Signatures and Disease Mechanism | 93.310 | 5U54HL127365-06 REVISED | | 1,647,705 | 120,399 |
| Physician Determinants of Health Care Spending, Quality, and Patient Outcomes | 93.310 | 5DP5OD017897-05 | | 76,022 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
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| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Psychological functions of music in infancy | 93.310 | 5DP5OD024566-03 | | 370,420 | - |
| Quantification and prediction of treatment efficacy for HIV cure strategies | 93.310 | 5DP5OD019851-05 | | 397,580 | - |
| Single-cell epigenomic and cellular plasticity | 93.310 | 1DP2HL151353-01 | | 409,428 | - |
| Subcellular RNA-Proteome Mapping in Subtype- and Circuit-specific Growth Cones: Development, Cell Biology, Disease, and Regeneratior | 93.310 | 5DP1NS106665-03 | | 1,219,591 | - |
| Syringe Injectable Mesh Electronics for Seamless Integration with the Central Nervous System | 93.310 | 5DP1EB025835-03 | | 1,079,388 | - |
| Tools to facilitate manipulation of protein-specific glycosylation stoichiometry in cells | 93.310 | 1U01CA242098-01 | | 454,247 | 16,379 |
| Transporting established insights from classical experimental design to address causal questions in environmental epidemiology, including the understanding of biological mediating mechanisms | 93.310 | 5DP5OD021412-04 | | 339,478 | - |
| Uncovering molecular effectors of mammalian aging | 93.310 | 5DP1AG063419-02 | | 1,018,899 | - |
| **Total for CFDA 93.310** | | | | 13,153,875 | 136,778 |
| Harvard Clinical and Translational Science Center | 93.350 | 5KL2TR001100-05 REVISED | | (788) | (788) |
| Institutional Career Development Core | 93.350 | 5KL2TR002542-02 | | 2,230,530 | 2,093,052 |
| NRSA Training Core | 93.350 | 5TL1TR002543-02 | | 519,232 | - |
| Robotic Apparel to Enable Low Force Haptic Cueing for Improving Parkinson's Gait | 93.350 | 5U01TR002775-02 REVISED | | 364,298 | 14,167 |
| The Harvard Clinical and Translational Science Center | 93.350 | 3UL1TR002541-02S1 | | 20,784,638 | 7,731,295 |
| **Total for CFDA 93.350** | | | | 23,897,910 | 9,837,726 |
| Acquisition of a Sub-micron High-Resolution 3D X-Ray Imaging System | 93.351 | 1S10OD023519-01A1 | | 1,767,201 | - |
| ARC: Building Awareness, Respect, and Confidence through Genetics | 93.351 | 5R25GM129172-05 | | 239,682 | - |
| Drosophila resources for modeling human diseases | 93.351 | 5R24OD021997-04 | | 204,858 | - |
| Next-generation Drosophila cell lines to elucidate the cellular basis of human diseases | 93.351 | 3R24OD019847-03S1 REVISED | | 703,150 | 260,464 |
| TissueCyte 1600FC Whole Mount Tissue Scanner | 93.351 | 1S10OD026866-01 | | 611,590 | - |
| Using CRISPR technology to study the function of paralogous genes | 93.351 | 3R24OD026435-02S1 | | 552,227 | 140,139 |
| **Total for CFDA 93.351** | | | | 4,078,708 | 400,603 |
| Area A: High Precision Single Cell Genomes: Linear Amplification and Digital Haplotypes | 93.353 | 1R33CA225344-01 REVISED | | 108,937 | 108,937 |
| Biomaterials to Create T Cell Immunity | 93.353 | 1U54CA244726-01 | | 289,746 | - |
| The Implementation Science Center for Cancer Control Equity | 93.353 | 1P50CA244433-01 | | 204,746 | 37,318 |
| The pre-cancer atlases of cutaneous and hematologic origin (PATCH Center) | 93.353 | 1U2CCA233262-01 REVISED | | 1,405,396 | 531,534 |
| **Total for CFDA 93.353** | | | | 2,008,825 | 677,789 |
| 4D Nucleome Network Data Coordination and Integration Center | 93.393 | 5U01CA200059-05 REVISED | | 2,961,414 | 175,834 |
| Bone metabolism and bone metastases in prostate cancer | 93.393 | 5R01CA179129-05Revised | | 804 | - |
| Cancer Epidemiology Cohort in Male Health Professionals | 93.393 | 5U01CA167552-08REVISED | | 1,884,490 | 113,341 |
| Circadian Disruption and Risk of Prostate Cancer in a Multiethnic Cohort | 93.393 | 5R01CA202690-04 | | 146,673 | 106,294 |
| Colorectal carcinogenesis and Fusobacterium nucleatum: oncomicrobe, oncometabolites, and oncoimmunology | 93.393 | 5R01CA154426-08 | | 383,353 | - |
| Comparative Modeling to Inform Cervical Cancer Control Policies | 93.393 | 3U01CA199334-05S1 | | 1,425,075 | 943,907 |
| Genomic targets of oncoproteins and tumor suppressors | 93.393 | 5R01CA107486-12 | | 895,521 | - |
| Impact of screening and diagnostic intensity on the study of prostate cancer epidemiology | 93.393 | 1R03CA226942-01A1REVISED | | 62,033 | - |
| Inference of variable chromatin loops in glioblastoma tumors and single-cells | 93.393 | 5F31CA232670-02 | | 28,844 | - |
| Informing anti-tobacco communications with affective and decision science: Application of the Appraisal Tendency Framework | 93.393 | 1R01CA224545-01A1 REVISED | | 189,306 | 17,979 |
| Integrating diet and tissue whole exome sequencing data to study processed meat and colorectal cancer | 93.393 | 5R21CA222940-02 REVISED | | 113,402 | 17,411 |
| Integrating diet, lifestyle and tumor tissue molecular subtyping to study the role of adolescent calcium intake on the risk of early onset colorectal neoplasia | 93.393 | 5R21CA230873-02 | | 216,222 | 71,970 |
| Integrative Approach to Understand the Role of Diet, Physical Activity and Adiposity on Survival in Patients with Colorectal, Endometrial and Prostate Cancer | 93.393 | 1R03CA249027-01 | | 4,620 | - |
| Life Course Cancer Epidemiology Cohort in Women | 93.393 | 5U01CA176726-07 REVISED | | 2,547,050 | 1,818,868 |
| Marine omega-3 fatty acid, gut microbiome and colorectal cancer prevention | 93.393 | 5R00CA215314-03REVISED | | 110,029 | 7,630 |
| Metabolic Recycling and Compartmentalization in Tumor Progression | 93.393 | 1F99CA234839-01 REVISED | | (3,806) | - |
| Molecular Biology of Oncogenic Papillomaviruses | 93.393 | 5R35CA197262-05 REVISED | | 1,052,791 | - |
| Risk Factors for Breast Cancer in Younger Nurses | 93.393 | 5R01CA050385-30 | | 578,957 | 403,118 |
| Semi-supervised Algorithms for Risk Assessment with Noisy EHR Data | 93.393 | 1R21CA242940-01 | | 131,482 | 29,073 |
| Single-cell analysis of tumor-microenvironment interactions in follicular lymphoma | 93.393 | 5R21CA220147-03 | | 74,976 | 67,411 |
| Single-molecule analysis of eukaryotic transcription activation | 93.393 | 1R01CA246500-01A1 | | 121,591 | 29,624 |
| Statistical framework for assessing drug sensitivity in vitro and linking patient outcomes | 93.393 | 1F99CA245736-01 | | 28,287 | - |
| Statistical Methods for Analysis of Massive Genetic and Genomic Data in Cancer Research | 93.393 | 5R35CA197449-05 | | 1,016,873 | - |
| Statistical methods for analysis of pooled continuous biomarker data arisen from multiple studies | 93.393 | 5R03CA212799-02REVISED | | 15,615 | - |
| The Boston Lung Cancer Survival Cohort | 93.393 | 5U01CA209414-03 | | 1,063,099 | 478,159 |
| The Genetic Architecture of Breast Parenchymal Textural Features and its Implications for Breast Cancer Risk | 93.393 | 5R03CA224196-02 | | 6,855 | - |
| Theory and methods for mediation and interaction | 93.393 | 5R01CA222147-02 | | 274,088 | 78,717 |
| Understanding the Mechanism of a Gut Microbial Genotoxin Involved in Colorectal Carcinogenesis | 93.393 | 5R01CA208834-04 | | 306,514 | 48,160 |
| **Total for CFDA 93.393** | | | | 15,636,158 | 4,407,496 |
| Droplet microfluidic technology for single cell cancer genomics | 93.394 | 5R33CA212697-03 REVISED | | 383,543 | - |
| Effective Training Models for Implementing Health-Promoting Practices Afterschool | 93.394 | 5R21CA201567-02Revised | | 4,359 | - |
| **Total for CFDA 93.394** | | | | 387,902 | - |
| Biomaterial Cancer Vaccines that Generate Patient-Specific Antigen In Situ | 93.395 | 5R01CA223255-03 REVISED | | 276,320 | - |
| Developmental regulation of apoptosis as a modifiable driver of radiotherapy-induced neurocognitive impairment in pediatric patients | 93.395 | 1R37CA248565-01 | | 90,533 | - |
| Regulation of Apoptotic Priming and Competence in Healthy and Cancerous Cells | 93.395 | 5R00CA188679-05 | | 243,555 | - |
| Synthesis and Study of Natural and Non-natural Antiproliferative Agents | 93.395 | 5R01CA047148-33 | | 587,472 | - |
| Target MDM2/MDMX for reducing normal tissue toxicity induced by chemotherapy | 93.395 | 1R01CA233558-01A1 | | 287,321 | - |
| **Total for CFDA 93.395** | | | | 1,485,201 | - |
| 3D Models of Immunotherapy | 93.396 | 5U01CA214369-04 | | 711,766 | 282,160 |
| Analysis of Intratumoral Crosstalk in Clonal Populations of OvarianTumor Cells | 93.396 | 5R01CA181543-05 REVISED | | 97,023 | - |

**Harvard University**
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| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Cellular and molecular mechanism of Hippo signaling in suppressing liver tumor formation | 93.396 | 5R01CA222571-02 | | 547,459 | - |
| Decoding and targeting the PI3K-mTOR signaling network in cancer | 93.396 | 5R35CA197459-05 | | 623,075 | 25,339 |
| Elucidating chromatin organization with molecular rulers | 93.396 | 1R21CA235421-01 | | 185,048 | - |
| Epithelial layer jamming in breast cancer cell migration | 93.396 | 5U01CA202123-05 | | 723,055 | 189,075 |
| Molecular mechanisms of Nutrient sensing in cancer | 93.396 | 5R01CA213062-03 | | 487,391 | - |
| Notch Signaling in Cancer | 93.396 | 5R35CA220340-03 | | 1,040,857 | - |
| Roles of Eukaryotic Translation Initiation Factors in Gene Expression | 93.396 | 5R01CA200913-04 | | 345,069 | - |
| Single Cell Genome-Wide Myeloid Response Profiling in Immunotherapy | 93.396 | 5R01CA218579-02 | | 602,483 | 377,028 |
| Tracking the evolution of breast cancer through single cell analyses of premalignant breast tissues from women at high risk for cancer development | 93.396 | 1R35CA242428-01 | | 427,988 | - |
| Unraveling the Complexities of Risk and Mechanism in Cancer | 93.396 | 5R35CA220523-02 | | 1,041,000 | 71,703 |
| Visualizing healthcare system dynamics in biomedical Big Data | 93.396 | 5U01CA198934-03 REVISED | | 6,767 | 6,767 |
| WebMeV: A Robust Platform for Intuitive Genomic Data Analysis | 93.396 | 1U24CA231846-01A1 | | 299,236 | - |
| **Total for CFDA 93.396** | | | | 7,138,217 | 952,072 |
| Systems Pharmacology of Therapeutic and Adverse Responses to ImmuneCheckpoint and Small Molecule Drugs | 93.397 | 5U54CA225088-03 | | 2,166,334 | 416,402 |
| **Total for CFDA 93.397** | | | | 2,166,334 | 416,402 |
| Analysis of tumor-stroma signaling that mediates HER2-therapy resistance in breast cancer | 93.398 | 5K99CA222554-02 REVISED | | 22,703 | - |
| Automatic Volumetric Treatment Response Assessment and Determination of Regional Genetic Characteristics in Glioblastoma | 93.398 | 5F30CA239407-03 | | 4,178 | - |
| Behavioral Economics and Improving Chemotherapy Decisions for Advanced Cancer | 93.398 | 5K24CA181510-05 | | 99,330 | 15,185 |
| Characterizing ETV6 as a regulator of EWS-FLI oncoprotein in Ewing Sarcoma | 93.398 | 1F30CA246925-01 REVISED | | 2,110 | - |
| Deciphering the role of Six2 in regulating cancer stem cell properties and promoting late-stage metastasis in breast cancer | 93.398 | 4K00CA223023-03 | | 78,190 | - |
| Defining the Novel mTORC-ATF4 Axis in Cancer | 93.398 | 5F31CA228332-02 | | 32,900 | - |
| Development of covalent Pin1 inhibitors for the treatment of triple negative breast cancer | 93.398 | 5F31CA225066-02 REVISED | | 10,192 | - |
| Drug Tolerant Persisters in EGFR-mutant Non-small Cell Lung Cancer: Epigenetic Landscape and Therapeutic Targeting | 93.398 | 5F30CA213726-03 | | 45,848 | - |
| Effects of Brca1 Heterozygosity on Mammary Gland Biology | 93.398 | 5F31CA228200-02 | | 31,078 | - |
| Elucidating Oncogenic Mechanisms of CBL RING Domain Mutations | 93.398 | 5F30CA236112-02 REVISED | | 36,379 | - |
| Etiology of glioma and glioblastoma | 93.398 | 1F30CA235791-01A1 | | 36,506 | - |
| Genome-scale CRISPR activation screening to identify lung-specific metastatic pathways | 93.398 | 5F30CA232407-02 | | 36,212 | - |
| Harvard Education Program in Cancer Prevention Control | 93.398 | 2T32CA057711-26REVISED | | 350,794 | - |
| Harvard Education Program in Cancer Prevention Control | 93.398 | 5R25CA057711-25 | | 54,608 | - |
| Identifying optimal dynamic strategies for prostate cancer control | 93.398 | 1K99CA248335-01 | | 7,925 | - |
| Impact of RPS 15 mutation on development and progression of chronic lymphocytic leukemia | 93.398 | 1F31CA239443-01 REVISED | | 36,542 | - |
| Interrogating the role for ATP-dependent chromatin remodeling complexes in immune response | 93.398 | 5F30CA239317-02 | | 36,379 | - |
| Investigating metabolic adaptations of Myc-dependent cancers | 93.398 | 5F31CA210310-03 | | 22,722 | - |
| Investigating the Functional Consequences of SMARCE1 loss in Clear Cell Meningioma | 93.398 | 5F31CA228441-02 | | 31,291 | - |
| Investigating the role of ALG3 in the regulation of N-glycosylation by PI3K/AKT signaling in breast and lung cancer | 93.398 | 1F31CA250094-01 | | 4,220 | - |
| Investigating the role of Strada signaling in promoting AML chemoresistance | 93.398 | 5F31CA213902-02 REVISED | | 44,246 | - |
| MCV ST activates specific gene transcription by redirecting the activity of the Tip60/p400 complex | 93.398 | 1F31CA239345-01 | | 38,281 | - |
| Mechanically mediated genomic changes during the metastatic cascade | 93.398 | 5F30CA224588-02 | | 39,676 | - |
| Metabolic regulation of anti-tumor T cell responses | 93.398 | 5F31CA224601-03 | | 31,162 | - |
| Molecular regulation and therapeutic targeting of the TSC signaling network | 93.398 | 5F32CA221080-02REVISED | | 10,172 | - |
| Novel Cannabinoid and Terpene Admixture can Reverse Bile Acid-Induced Carcinogenesis in the Esophagus | 93.398 | 1K01CA226375-01A1 REVISED | | 24,420 | - |
| Optimal BET inhibitor combination therapies in triple negative breast cancer | 93.398 | 5F30CA228208-03 REVISED | | 57,188 | - |
| Overcoming Tumor Resistance with Enzyme-Instructed Nanoscale Assemblies and Immunotherapies | 93.398 | 4K00CA234746-03 | | 20,329 | - |
| Program for Training in Cancer Epidemiology | 93.398 | 2T32CA009001-44 REVISED | | 121,750 | - |
| Program for Training in Cancer Epidemiology | 93.398 | 5T32CA009001-43 | | 365,167 | - |
| Rational Design of Combination Therapy Administration Schedules Using Mathematical Modeling | 93.398 | 1F31CA239565-01 | | 34,439 | - |
| Redefining the Molecular Landscape of Melanoma | 93.398 | 1F31CA239347-01 | | 37,081 | - |
| Regulation of arginine metabolism as a therapeutic target in breast cancer | 93.398 | 5F31CA213460-03 | | 25,718 | - |
| Role of DHX29 in the regulation of Hippo pathway effectors YAP/TAZ in cancer | 93.398 | 5F31CA235893-02 | | 32,404 | - |
| Role of the Gut Microbiota in Regulating Responses to anti-PD-1 Cancer Immunotherapy | 93.398 | 1F32CA247072-01 REVISED | | 33,953 | - |
| Small molecule inhibitors for the study of colibactin-induced carcinogenesis by gut microbes | 93.398 | 1F31CA247069-01 REVISED | | 18,340 | - |
| Statistical Methods for Characterizing Tumor Heterogeneity at the Single Cell Level | 93.398 | 3K00CA222750-03S1 | | 71,788 | - |
| The mechanism of cancer-specific allele selection for K-RAS | 93.398 | 1F31CA243163-01 | | 30,126 | - |
| Training Grant in Quantitative Sciences for Cancer Research | 93.398 | 5T32CA009337-39 | | 513,192 | - |
| **Total for CFDA 93.398** | | | | 2,529,539 | 15,185 |
| Determinants of an Effective Job Training Program: An Analysis of Year Up | 93.595 | 90PE0039-01-00 | | 15,171 | - |
| **Total for CFDA 93.595** | | | | 15,171 | - |
| A novel approach to professional development for early childhood educators and caregivers | 93.647 | 90PD0305-01-01 | | 17,393 | - |
| **Total for CFDA 93.647** | | | | 17,393 | - |
| Harvard Clinical and Translational Science Center- NCRR ARRA Supplement- Translational (Imaging) | 93.701 | 3UL1RR025758-02S3 | | (4,915) | (4,915) |
| **Total for CFDA 93.701** | | | | (4,915) | (4,915) |
| A defend and destroy approach to curing HIV | 93.837 | 5U19HL129903-05 REVISED | | 1,680,279 | 1,117,888 |
| Acoustic speech analysis of patients with decompensated heart failure | 93.837 | 1F31HL143824-01A1 | | 26,984 | - |
| Assessing the effects of antihypertensive medication adherence through bayesian dynamic linear models | 93.837 | 7R21HL121366-03 REVISED | | 1,837 | - |
| Bioprinting A Physiologically Aligned, Thick Cardiac Tissue for Regenerative Medicine | 93.837 | 1F31HL144043-01A1 | | 31,326 | - |
| Characterizing the mechanism of loss-of-function mutations in ALPK3 in the pathogenesis of cardiomyopathy | 93.837 | 1F30HL147389-01 | | 34,474 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
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| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Complement Activation and Initiation of Heart Regeneration | 93.837 | 5R01HL137710-03 | | 412,972 | - |
| CVD Epidemiology Training Program in Behavior, the Environment and Global Health | 93.837 | 2T32HL098048-11 | | 74,462 | - |
| CVD Epidemiology Training Program in Behavior, the Environment and Global Health | 93.837 | 5T32HL098048-10 | | 343,178 | - |
| Defining Genetic Architecture and Pathways of DCM | 93.837 | 5R01HL080494-12 | | 521,943 | - |
| Developing Standardized Intraoperative Process Models to Enhance Surgical Safety | 93.837 | 5R01HL126896-03 | | 107,788 | 67,143 |
| Diet quality and cardiometabolic disparities among Latino ethnic subgroups | 93.837 | 5K01HL120951-05 | | 48,660 | - |
| Dietary Etiologies of Heart Disease | 93.837 | 5R01HL035464-29 | | 666,489 | 126,875 |
| Genetic Determinants of Chagas Cardiomyopathy | 93.837 | 5R01HL133165-04 | | 412,745 | - |
| Genetic Signals in Ventricular Hypertrophy | 93.837 | 2R01HL084553-10A1 | | 343,890 | - |
| HIV-induced transcriptional changes in alveolar macrophages in susceptibility to M. tuberculosis infection | 93.837 | 5F30HL134566-03 | | 4,054 | - |
| Integrating lifecourse approaches, biologic and digital phenotypes in support of heart and lung disease epidemiologic research. | 93.837 | 5U01HL145386-02 | | 1,717,506 | 1,138,822 |
| Investigating the role of the complement system in cardiac regeneration | 93.837 | 1F32HL146000-01A1 | | 32,209 | - |
| Mechanisms of DNA interstrand cross-link repair | 93.837 | 5R01HL098316-08 | | 364,438 | - |
| Mediterranean diet, Metabolites, and cardiovascular Disease | 93.837 | 3R01HL118264-07S1 | | 540,293 | 325,877 |
| Molecular Architecture Of The Mitochondrial Calcium Uniporter | 93.837 | 5R01HL130143-04 | | 718,242 | 259,563 |
| Molecular Quiescence and Cardiomyocyte Maturation | 93.837 | 1R01HL151684-01 | | 52,622 | - |
| Multi-scale modeling of inherited pediatric cardiomyopathies | 93.837 | 4UH3HL141798-03 REVISED | | 949,792 | 166,498 |
| Multi-scale modeling of inherited pediatric cardiomyopathies | 93.837 | 5UG3HL141798-02 REVISED | | 198,025 | 114,623 |
| NHLBI Summer Training Experience to Increase Diversity in Health-Related Research | 93.837 | 5R25HL121029-05 REVISED | | 112,987 | - |
| Novel pathways controlling macrophage inflammation and resolution in atherosclerosis | 93.837 | 1R01HL148137-01 | | 542,275 | 65,776 |
| Regulation of Cardiac Development in Health and Disease | 93.837 | 5UM1HL098166-11 | | 860,094 | 561,639 |
| Reprogramming Non-myocytes to Cardiomyocytes in vivo | 93.837 | 5R01HL119230-04 | | 428,361 | 28,309 |
| Reverse Engineering the Alveolus: From cellular to microenvironmental specification during development | 93.837 | 4R00HL127267-03 REVISED | | 245,118 | - |
| Role of interleukin-3 in autoimmune and viral myocarditis | 93.837 | 1F31HL147364-01 | | 32,183 | - |
| Sensory biology of respiratory control neurons in the vagus nerve | 93.837 | 5R01HL132255-04 | | 265,688 | - |
| Simulation Modeling and Disparities in Obesity and Chronic Disease | 93.837 | 1R01HL146625-01 | | 275,580 | - |
| Statistical methods for analysis of single-cell variability | 93.837 | 5R01HL131768-05 | | 861,323 | 218,537 |
| The development and integration of advanced cyberinfrastructure, leading-edge tools, and FAIR data to accelerate discovery by the NHLBI research community | 93.837 | 3OT3HL142480-01S2 | | 2,392,311 | 25,677 |
| The role of immunometabolic pathways in atherosclerosis | 93.837 | 5R01HL125753-04 REVISED | | (3) | - |
| The role of the enteric microbiome in chronic HIV pathogenesis and cardiovascular disease in HIV-infected individuals | 93.837 | 5F30HL136257-03 | | 54,444 | - |
| Training in Interdisciplinary Pulmonary Sciences | 93.837 | 5T32HL007118-44 | | 558,907 | - |
| **Total for CFDA 93.837** | | | | 15,913,476 | 4,217,227 |
| Dissecting the Lineage and Function of the Airway Brush Cell | 93.838 | 5F31HL136128-02 REVISED | | 10 | - |
| Function and application of lung surfactant proteins | 93.838 | 1R01HL150520-01 | | 63,018 | - |
| Lung-on-a-Chip Disease Models for Efficacy Testing | 93.838 | 4UH3HL141797-03 REVISED | | 1,301,088 | - |
| Lung-on-a-Chip Disease Models for Efficacy Testing | 93.838 | 5UG3HL141797-02 REVISED | | 25,185 | - |
| Lung-on-a-chip pulmonary fibrosis model for drug discovery | 93.838 | 1F32HL146070-01 REVISED | | 9,857 | - |
| MicroRNA-10a in Airway Smooth Muscle and Asthma | 93.838 | 5R01HL139496-03 | | 665,475 | 181,022 |
| Physics of bronchial epithelial unjamming | 93.838 | 1R01HL148152-01 | | 465,514 | - |
| Physics of collective cellular migration in lung health and disease | 93.838 | 5P01HL120839-05 | | 143,044 | 108,161 |
| Predicting Pulmonary and Cardiac Morbidity in Preterm Infants with Deep Learning | 93.838 | 7K01HL141771-02 | | 145,889 | - |
| Trial of Vitamin D Supplementation to Prevent TB Infection in Schoolchildren | 93.838 | 5R01HL122624-05REV | | 211,717 | 56,699 |
| **Total for CFDA 93.838** | | | | 3,030,797 | 345,882 |
| A novel program of ubiquitination in global remodeling of the erythroid proteome | 93.839 | 5R01HL125710-04 | | 36,337 | 36,337 |
| Characterizing the clonal dynamics and origins of the developing hematopoietic system | 93.839 | 5F30HL137235-03 | | 53,764 | - |
| Functional analysis of red blood cell determinants of Plasmodium invasion | 93.839 | 5R01HL139337-04 | | 570,014 | - |
| Investigating host kinase modulation of erythrocyte deformability during Plasmodium falciparum invasion | 93.839 | 1F31HL154510-01 | | 2,110 | - |
| Investigating the role of ZBTB33 loss in clonal hematopoiesis and hematologic malignancies | 93.839 | 5F31HL143844-02 | | 24,749 | - |
| Mechanisms of DNA interstrand cross-link repair | 93.839 | 2R01HL098316-09 | | 115,265 | - |
| Red cell determinants of premature hemolysis of Plasmodium infected red cells | 93.839 | 5F32HL136173-03 | | 71,311 | - |
| Single-Cell Profiling and Lineage Tracing of Zebrafish Hematopoiesis | 93.839 | 1F30HL152628-01 | | 4,220 | - |
| Stem Cell-Niche Interactions in the Establishment of Hematopoietic Stem Cell Heterogeneity | 93.839 | 1F31HL149154-01 | | 31,470 | - |
| The Molecular Mechanism of the CD19-CD81 B Cell Co-Receptor Complex | 93.839 | 1F31HL147459-01 | | 36,960 | - |
| **Total for CFDA 93.839** | | | | 946,200 | 36,337 |
| Project Title: PROSPECT: Puerto Rico Observational Study of Psychosocial, Environmental, and Chronic Disease Trends | 93.840 | 5R01HL143792-02 | | 562,837 | 357,223 |
| **Total for CFDA 93.840** | | | | 562,837 | 357,223 |
| A mechanism for tyrosine phosphorylation of extracellular matrix proteins | 93.846 | 5R21AR072192-02 | | 76,231 | - |
| Adult Bone Mass Regulation by Type 2 BMP Receptors | 93.846 | 5R01AR064227-05 | | 72,992 | - |
| Biogenesis of Extracellular Matrix | 93.846 | 5R56AR036819-34 | | 354,367 | - |
| Characterization of the Insulin to Autophagy Pathway in Muscles | 93.846 | 5R01AR057352-10 | | 412,037 | - |
| Development, Evaluation and Translation of Robotic Apparel for Alleviating Low Back Pain | 93.846 | 1UH2AR076731-01 | | 224,031 | - |
| Elucidation of the Role of Creb5 in Synovial Joint Formation | 93.846 | 1R01AR074385-01A1 | | 405,811 | - |
| Epigenetic regulation of skeletal patterning and morphogenesis during development | 93.846 | 5K01AR069197-04 | | 104,938 | - |
| Hypertrophy and Inflammation in Osteoarthritis: epistasis or synergy | 93.846 | 5R01AR069671-04 | | 417,770 | - |
| Interdependence of lineages within the mammalian skin | 93.846 | 5R01AR070825-04 | | 225,821 | - |
| Investigating modes of cartilage cell size regulation and fate during endochondral ossification | 93.846 | 1F32AR076187-01 | | 57,432 | - |
| Mechanism of action of PTH: New signaling components that regulate bone formation and bone marrow fat | 93.846 | 1R01AR073774-01A1 REVISED | | 24,247 | - |
| Molecular Mechanism of Wnt/Planar Cell Polarity Signaling | 93.846 | 5R01AR070877-04 | | 255,451 | - |
| Muscle Tregs in health and disease | 93.846 | 5R01AR070334-04 | | 325,407 | - |

**Harvard University**
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| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Regulation of Skin Inflammation by Nociceptive Sensory Neurons | 93.846 | 5R01AR068383-05 | | 263,272 | - |
| Role of the first secreted tyrosine kinase in bone development, homeostasis, and repair. | 93.846 | 5R01AR066717-05 | | 511,578 | - |
| R-Spondin3 as a target for anabolic bone therapy | 93.846 | 5R01AR064724-05 | | (6,821) | - |
| The role of mechanical stimulation in macrophage-mediated skeletal muscle regeneration in an in vitro injury model | 93.846 | 1F31AR075367-01 | | 34,948 | - |
| Uncovering the Genetic Mechanisms Behind Joint-Specific Osteoarthritis | 93.846 | 5R01AR070139-02 REVISED | | 676,515 | 272,664 |
| **Total for CFDA 93.846** | | | | 4,436,027 | 272,664 |
| Adipose-tissue Tregs: important players in immunological control of metabolism | 93.847 | 2R01DK092541-09 | | 361,234 | - |
| Adipose-tissue Tregs: important players in immunological control of metabolism | 93.847 | 5R01DK092541-08 | | 28,933 | - |
| Adjusting for selection bias due to missing data in electronic health records-based research | 93.847 | 5F31DK118817-02 | | 26,189 | - |
| Aire, a zinc-finger protein that controls autoimmunity | 93.847 | 5R01DK060027-20 | | 395,131 | - |
| Automated Glucose Regulation to improve Diabetes Control and Outcomes for Pregnant Women with Type 1 Diabetes and Fetus | 93.847 | 5R01DK120358-02 | | 877,978 | 552,856 |
| Bacterial Metabolites controlling Th17 cells | 93.847 | 5R01DK110559-05 | | 455,011 | 26,989 |
| Biomanufacturing of Vascularized Kidney Tissues: A Foundational Step towards Building a Kidney | 93.847 | 1R56DK122380-01 | | 211,326 | 45,478 |
| Cell and Molecular Dynamics of Hematopoiesis In Vivo | 93.847 | 5R24DK103074-04 | | 32,097 | 32,097 |
| Cellular signaling in muscle metabolic adaptation and energy metabolism | 93.847 | 5R01DK113791-03 | | 516,353 | - |
| Central circuitry controlling micturition | 93.847 | 5R01DK114834-03 | | 307,260 | 125,610 |
| Charting vagal circuits containing glucagon-like peptide 1 receptor | 93.847 | 5R01DK103703-04 | | 226,621 | - |
| Chronic Inflammation and Type 2 Diabetes: A Multi-omics Approach | 93.847 | 1K99DK122128-01 | | 65,408 | - |
| Control of metabolic homeostasis in diabetes by sirtuins | 93.847 | 5R01DK103295-04 REVISED | | 85,034 | - |
| Coordination of Energy Metabolism Across Individual Tissues in Mammals | 93.847 | 4R00DK117066-03 | | 33,569 | - |
| Deciphering the molecular basis of T1D in human cells using functional genomics | 93.847 | 1DP3DK111898-01 REVISED | | 788,107 | 519,743 |
| Dietary Interventions, Metabolites, and Risk of Type 2 Diabetes | 93.847 | 5R01DK102896-04-REVISED | | 41,643 | 17,570 |
| Effect of mitochondrial mutations on ion channel activity and cytoskeletal homeostasis | 93.847 | 5F30DK112477-03 | | 49,934 | - |
| Elucidating mechanisms of SIRT1 activation | 93.847 | 5R01DK100263-04 REVISED | | 587,582 | - |
| Empowerment as a mechanism for change in childhood obesity prevention | 93.847 | 5R01DK108200-05REVISED | | 116,315 | 66,987 |
| FOOD-BASED BIOMARKERS, DIET QUALITY, AND CARDIOMETABOLIC HEALTH | 93.847 | 1R01DK120870-01 REVISED | | 401,993 | 241,384 |
| Generating novel sources of functional human insulin-secreting cells for T1D modeling | 93.847 | 1UC4DK116280-01 REVISED | | (5,835) | (5,835) |
| Hemoglobin A1c variability as a risk factor for diabetes complications | 93.847 | 1R01DK114098-01A1 | | 316,577 | 140,485 |
| Identifying targetable apoptotic vulnerabilities for the treatment of AL amyloidosis | 93.847 | 1R01DK125263-01 | | 34,043 | - |
| Identifying the Neural circuit for presystemic control of vasopressin release | 93.847 | 5F31DK109575-03 | | 25,990 | - |
| Investigating Renal Reabsorption Physiology in 3D-Printed Human Kidney Tissues | 93.847 | 1F32DK117575-01A1 REVISED | | 28,680 | - |
| Investigating the physiological mechanisms that allow the blind cavefish Astyanax mexicanus to thrive in a low nutrient environment | 93.847 | 5F32DK108495-03 | | 3,921 | - |
| Investigating the role of natural and engineered curli fibers in mediating interactions with the gut epithelium | 93.847 | 5R01DK110770-03 | | 231,556 | - |
| Lipid droplets and transcriptional regulation of metabolism | 93.847 | 1R01DK124913-01 | | 103,177 | - |
| Lipid-dependent regulation of human Th17 cell function | 93.847 | 5R01DK106351-05 | | 445,920 | - |
| Mapping protein communication between organs in homeostasis and disease | 93.847 | 5R01DK121409-02 | | 1,989,844 | 1,388,907 |
| Mechanisms of dietary control of the transsulfuration pathway and increased endogenous hydrogen sulfide production | 93.847 | 5R01DK090629-08 | | 285,701 | - |
| Mediterranean Diet, Polyphenol-Rich Foods, Gut Microbiota and Type 2 Diabetes | 93.847 | 5K99DK119412-02 | | 90,302 | - |
| Metabolomics and Type 2 Diabetes in a Cohort of Older Puerto Ricans | 93.847 | 5K01DK107804-04 | | 127,289 | - |
| Microbiota regulation of intestinal eosinophils | 93.847 | 1F31DK121375-01A1 | | 20,621 | - |
| Microgial Iron Metabolism and Its Regulation by Cannabinoids | 93.847 | 5R01DK064750-11REVISED | | 515,474 | - |
| Molecular mechanisms of sensory transduction in the gut | 93.847 | 5R00DK115879-03 | | 166,335 | - |
| Molecular pathways underlying organ-specific targeting by the vagus nerve | 93.847 | 5F32DK117798-02 REVISED | | 62,580 | - |
| Physiology of Lipid Droplets and Triglyceride Storage | 93.847 | 5R01DK101579-06 | | (150) | - |
| Post-Transcriptional Regulatory Mechanisms of Fetal Hemoglobin Repression | 93.847 | 1F31DK122637-01 | | 18,762 | - |
| Production of clinical-grade diabetes patient-specific induced pluripotent stem cell lines intended for autologous beta cell replacement therapy | 93.847 | 3UC4DK104165-01S1 REVISED | | 159,978 | 158,657 |
| PTH resistance and marrow adipogenesis | 93.847 | 5R01DK112374-03 | | 447,419 | 156,658 |
| Quantification of genetic circuits for detection of intestinal inflammation | 93.847 | 5F32DK112640-03 | | 38,056 | - |
| Regulation of Fructose Transport by Thioredoxin-Interacting Protein | 93.847 | 5R01DK107396-04 | | 456,726 | - |
| Role of Adipokine FABP4 in Glucoregulation and Counter Regulatory Responses | 93.847 | 1R01DK123458-01 | | 163,912 | - |
| Saliva and Plasma Metabolomic Signatures of Diabetes Progression in a Hispanic Cohort | 93.847 | 1R01DK120560-01 | | 274,418 | - |
| Training Grant in Academic Nutrition | 93.847 | 5T32DK007703-25 REVISED | | 315,904 | - |
| Transcriptomic Identification of Vagal Motor Neurons That Differentially Regulate Gastric Function | 93.847 | 1F31DK122620-01A1 | | 4,220 | - |
| **Total for CFDA 93.847** | | | | 11,929,138 | 3,467,586 |
| A Facility to Generate Connectomics Information | 93.853 | 1U24NS109102-01 REVISED | | 1,563,811 | - |
| A new molecular code for the development of synapse specificity | 93.853 | 1R01NS110713-01 | | 301,728 | 42,714 |
| A quantitative framework for understanding endosomal trafficking networks in Alzheimer's disease | 93.853 | 5R01NS110395-02 | | 399,284 | - |
| Action and interaction of ionotropic and metabotropic neurotransmission | 93.853 | 5R37NS046579-16 REVISED | | 351,594 | - |
| Activity-Dependent Regulation of the Neuronal Epigenome | 93.853 | 1K08NS112338-01A1 | | 13,777 | - |
| Architecture and function of striatal dopamine release machinery | 93.853 | 5R01NS103484-03 | | 492,082 | - |
| BDNF shapes the functional maturation of cortical interneurons | 93.853 | 1F31NS110120-01A1 | | 33,156 | - |
| Big data screening for associations between medication use and ALS | 93.853 | 5R21NS099910-02 REVISED | | 12,278 | 5,918 |
| C9ORF72 in Motor System Biology and ALS | 93.853 | 5R01NS089742-05 | | 58,111 | - |
| Cell type-specific vulnerability of neurons to axonal injury: comprehensive mapping of types and gene expression analyzed by high throughput single cell RNAseq | 93.853 | 5R21NS104248-02 | | (10,463) | - |
| Cerebellar Outputs | 93.853 | 5F32NS101889-03 | | 46,617 | - |
| Characterization of MeCP2-dependent gene regulation with temporal and mechanistic precision | 93.853 | 1K99NS112415-01 | | 77,700 | - |
| Cerebellar Outputs Through an Unconventional Nucleus | 93.853 | 1K99NS110978-01A1 REVISED | | 20,684 | - |
| Characterizing a spectrum of mosaic variation in the population and across neurological disorders | 93.853 | 1F31NS113414-01 | | 35,224 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Circuits, serotonergic neurons, and the modulation of behavior: Characterization of a specialized serotonergic neuron subtype responsive to dopamine and central to social behavior | 93.853 | 5F99NS108515-02 | | 33,679 | - |
| Circuit-specific transcriptional mechanisms underlying the precision of synaptic connectivity | 93.853 | 1R01NS103905-01A1 | | 339,741 | - |
| Contribution of Peripheral Mechanoreceptor Subtypes to the Functional Organization of Mouse Primary Somatosensory Cortex | 93.853 | 5F32NS105324-02 REVISED | | 31,285 | - |
| Control of long gene expression as a novel therapeutic approach for Rett syndrome | 93.853 | 5K08NS101064-03 | | 42,925 | - |
| Controlling the spatial extent of light-based monitoring and manipulation of neural activity in vivo | 93.853 | 1UF1NS108177-01 REVISED | | 606,032 | 53,092 |
| Core Facilities for Analysis of Neural Circuit Structure and Function | 93.853 | 5P30NS062685-09 REVISED | | 52,170 | - |
| Corticospinal modulation of tactile information processing in the spinal cord dorsal horn | 93.853 | 5F31NS101843-03 REVISED | | 32,488 | - |
| Defining a Role for the Entopeduncular Nucleus in Motivated Behavior | 93.853 | 5K99NS105883-02 | | 69,020 | - |
| Defining Synapse-Regulatory Functions of the Microtubule +TIP TACC in Drosophila | 93.853 | 5F31NS101756-03 REVISED | | 11,913 | - |
| Defining the cellular metabolic responses to brain activity using fluorescent biosensors | 93.853 | 5F32NS100331-03 | | 51,392 | - |
| Development of novel transsynaptic tracers for use in the central nervous system | 93.853 | 5R01NS083848-05 REVISED | | (1,049) | - |
| Development, Validation, and Application of a Stroke Policy Simulation Model | 93.853 | 5R01NS104143-02 | | 527,001 | 271,378 |
| Dissecting the role of the direct and indirect pathways in moment-to-moment action selection | 93.853 | 1F31NS113385-01 | | 34,206 | - |
| Distributional reinforcement learning in the brain | 93.853 | 1R01NS116753-01 | | 47,383 | - |
| Electrical Stimulation of Immediate Early Genes | 93.853 | 2R01NS028829-31 | | 124,774 | - |
| Electrical Stimulation of Immediate Early Genes | 93.853 | 5R37NS028829-30 | | 498,784 | - |
| Elucidating cutaneous mechanosensory circuits, from development to disease | 93.853 | 5R35NS097344-04 | | 794,569 | - |
| Epigenetic Regulation of Cortical Neuronal Lineage Progression | 93.853 | 5R01NS102228-03 REVISED | | 183,100 | - |
| Extracellular matrix dependent maintenance of cortical neuron identity | 93.853 | 5F31NS098539-03 | | 4,054 | - |
| Formation of a neuron-glia contact at single-cell resolution in C. elegans | 93.853 | 5F31NS103371-02 | | 2,027 | - |
| Functional analysis of whole-brain dynamics in learning | 93.853 | 1R01NS115484-01 | | 100,275 | - |
| Generation of mouse models to define the structural basis of Ntn1-DCC activity | 93.853 | 1R21NS113562-01 | | 262,106 | - |
| Growth cone RNA-proteome mapping in subtype-specific cortical circuit formation | 93.853 | 5F31NS103262-03 | | 15,497 | - |
| HMS/BCH Center for Neuroscience Research | 93.853 | 5P30NS072030-08 REVISED | | 579,496 | - |
| Investigating the Role of Long Gene Misregulation in Rett Syndrome | 93.853 | 5F32NS101739-02 REVISED | | (532) | - |
| Lagging or Leading Linking Substantia Nigra Activity to Spontaneous Motor Sequences | 93.853 | 3U01NS094191-03S1 | | (66,396) | - |
| Mammalian circadian clock: genetics of PERIOD complex composition and structure. | 93.853 | 5R01NS095977-03 | | 585,141 | - |
| Mapping serotonergic neuron subtypes protective for seizure-induced neurological and neurobehavioral changes | 93.853 | 5F31NS108406-02 | | 33,271 | - |
| Mechanisms and functions of synapses and circuits | 93.853 | 5R35NS097284-04 REVISED | | 1,133,628 | - |
| Mechanisms of seizure resistance in a mouse genetic model with altered metabolism | 93.853 | 5R01NS102586-03 REVISED | | 503,887 | - |
| Mechanisms of Vesicle Docking and Priming for Striatal Dopamine Release | 93.853 | 5F31NS105159-02 REVISED | | 32,488 | - |
| Molecular and genetic dissection of brain circuits controlling fever | 93.853 | 1R01NS112399-01A1 | | 108,320 | - |
| Mechanisms underlying neuronal enhancer specification during postnatal CNS development | 93.853 | 1R01NS115965-01 | | 36,440 | - |
| Mechanosensory feature extraction for directed motor control | 93.853 | 5R01NS101157-03 | | 274,782 | - |
| Megaplexed Neuronal Visualization Using Combinatorial Labeling and Iterative Staining | 93.853 | 1R01NS112716-01A1 | | 57,124 | - |
| Metabolic coupling of neuronal ion transport | 93.853 | 1F32NS116105-01 | | 10,140 | - |
| Metabolomics and risk of Parkinson's Disease | 93.853 | 3R01NS089619-05S1 | | 822,264 | 261,608 |
| MicroRNA-Dependent Regulation of Synaptic and Behavioral Plasticity in Drosophila | 93.853 | 5P01NS090994-04 REVISED | | 1,064,883 | 554,430 |
| miRNA Control of Synaptic Stability and Structural Plasticity | 93.853 | 1F99NS115341-01 | | 26,962 | - |
| Modulation of calcium-mediated plasticity signals in dendritic spines | 93.853 | 1F31NS113353-01 | | 32,970 | - |
| Molecular and functional characterization of the cells and circuits underlying the fever response | 93.853 | 1K99NS114107-01 REVISED | | 50,504 | - |
| Molecular Controls over Neurogenesis, Subtype Development, and Diversity of Cortical Output Projection Neurons | 93.853 | 5R01NS045523-15 | | 340,108 | - |
| Molecular development and diversity of callosal projection neurons | 93.853 | 1R01NS104055-01A1 | | 83,914 | - |
| Molecular Dissection of Active Zone Functions in Neurotransmitter Release | 93.853 | 5R01NS083898-05 REVISED | | 41,436 | - |
| Molecular Dissection of Active Zone Functions in Neurotransmitter Release | 93.853 | 5R01NS083898-07 | | 520,258 | - |
| Molecular mechanisms of neuron motility and axon guidance | 93.853 | 5R01NS069913-09 | | 350,425 | - |
| Molecular mechanisms of the blood brain barrier function and regulation | 93.853 | 1R35NS116820-01 | | 34,501 | - |
| Molecular Mechanisms of the sea anemone stinging response | 93.853 | 1F31NS117055-01 | | 6,330 | - |
| Molecular principles of neuronal maturation and integration in the adult and aging brain | 93.853 | 5R01NS103758-02 | | 388,757 | 171,142 |
| Motion Sequencing for All: pipelining, distribution and training to enable broad adoption of a next-generation platform for behavioral and neurobehavioral analysis | 93.853 | 1U24NS109520-01 REVISED | | 268,156 | - |
| Multiple timescales of motor planning and execution in mouse cortex | 93.853 | 1F31NS108450-01A1 | | 32,278 | - |
| Neural and computational mechanisms underlying the assembly of motor skills | 93.853 | 1K99NS112597-01 | | 63,108 | - |
| Neural circuits underlying the acquisition and control of motor skills | 93.853 | 5R01NS099323-04 | | 314,847 | - |
| Neuroimaging and Neuropsychological Biomarkers of Vascular Risk Factors | 93.853 | 5R01NS086882-05 | | 163,610 | 11,474 |
| Neuronal Activity-Dependent Regulation of MeCP2 | 93.853 | 5R01NS048276-15 | | 479,118 | - |
| Novel BEAM and R26-BEACON recombinase-based systems for mosaic analysis of gene function | 93.853 | 5R21NS104733-02 | | 39,548 | - |
| Novel lipoprotein particles, brain abnormalities, and risk of dementia and stroke | 93.853 | 5R01NS089638-04 | | 159,856 | 4,193 |
| Novel molecular genetic tool for large-scale labeling and modulating activity of neurons associated with particular physiological processes and behaviors | 93.853 | 3R21NS106406-01A1S1 REVISED | | 80,035 | - |
| Parietal cortex networks for sensorimotor processing during navigation | 93.853 | 2R01NS089521-06 | | 22,921 | - |
| Parietal cortex networks for sensorimotor processing during navigation | 93.853 | 5R01NS089521-05 | | 166,155 | - |
| Principles of multi-whisker stimulus integration in rodent somatosensory cortex | 93.853 | 5K00NS105186-03 | | 70,591 | - |
| Prospective study of biomarkers and risk factors for ALS incidence and progression | 93.853 | 4R01NS045893-11 REVISED | | (7,071) | - |
| Prospective study of vitamin D and MS risk in African Americans | 93.853 | 5R01NS103891-02 | | 631,898 | 68,297 |
| Regulation of Synapse Morphogenesis in Drosophila | 93.853 | 5R01NS069695-09 REVISED | | 170,067 | - |
| Sensorimotor processing, decision making, and internal states: towards a realistic multiscale circuit model of the larval zebrafish brain | 93.853 | 5U19NS104653-03 | | 2,870,088 | 691,372 |
| Sensory-motor processing in a developing nervous system | 93.853 | 5R01NS082525-04 | | 212,340 | 85,939 |
| Somatosensory and Autonomic Circuit Modulation by Brainstem Serotonergic Neurons | 93.853 | 5F32NS106762-02 REVISED | | 13,454 | - |
| Specification of Neuronal Enhancers during Postnatal Development | 93.853 | 1F32NS112455-01 | | 61,225 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| State-dependent interaction of antiepileptic drugs with voltage-dependent sodium channels and differential regulation of excitatory and inhibitory central neurons | 93.853 | 5R01NS110860-02 | | 331,263 | - |
| Stimulus Selectivity in Drosophila Primary Mechanosensory Neurons | 93.853 | 5F31NS106982-02 | | 13,429 | - |
| Structural and functional development of touch sensory neurons | 93.853 | 5F32NS106807-02 | | 64,163 | - |
| Structure and function of the mouse parafasicular and entopeduncular nuclei | 93.853 | 3R01NS103226-03S1 | | 558,494 | 97,694 |
| Studying perceptual decision-making across cortex by combining population imaging, connectomics, and computational modeling | 93.853 | 5R01NS108410-02 | | 1,129,047 | 37,232 |
| Synaptic Choices in the Retinotectal System | 93.853 | 5R37NS029169-29 | | 103,369 | - |
| Synaptic connectivity of Basal Forebrain neurotransmitter systems | 93.853 | 5K99NS102429-02 | | 65,032 | - |
| Systematic discovery and functional analysis of the PARKIN modified proteome | 93.853 | 5R37NS083524-15 | | 309,425 | - |
| Systems-level and in situ transcriptomics deconstruction of neural circuits underlying sensorimotor transformation in an innate behavior | 93.853 | 1R01NS116593-01 | | 274,158 | - |
| The Development and Integration of Early Born SST-Expressing | 93.853 | 5R01NS081297-07 | | 611,957 | - |
| The diversity of dopamine neurons: from connectivity and activity to functions | 93.853 | 5R01NS108740-02 | | 763,393 | - |
| The Impact of Telestroke on Patterns of Care and Long-Term Outcomes | 93.853 | 1R01NS111952-01 | | 525,336 | 88,691 |
| Towards a unified framework for dopamine signaling in the striatum | 93.853 | 1U19NS113201-01 | | 1,659,601 | 428,734 |
| Training in Neurostatistics and Neuroepidemiology | 93.853 | 5T32NS048005-15REVISED | | 9,936 | - |
| Voltage-Dependent Ion Channels Controlling Firing Patterns of Central Neurons | 93.853 | 5R01NS036855-23 | | 309,965 | - |
| **Total for CFDA 93.853** | | | | 26,850,848 | 2,873,908 |
| A clinical trial to evaluate the impact of broadly neutralizing antibody VRC01 on HIV viral reservoir and maintenance of suppression in a cohort of early-treated children in Botswana | 93.855 | 5U01AI135940-03 | | 2,232,611 | 1,563,623 |
| A genetic template for generating universally protective responses to influenza | 93.855 | 1F31AI138368-01A1 | | 25,990 | - |
| A Non-Canonical Translation Mechanism for Vesicular Stomatitis Virus | 93.855 | 5F31AI138448-02 | | 32,146 | - |
| Accompanying HIV-positive adolescents through the transition into adult care: a feasibility study | 93.855 | 5R21AI143365-02 | | 212,163 | 63,818 |
| Acquisition, maintenance, and transmission of antibiotic resistance in Neisseria gonorrhoeae | 93.855 | 1F32AI145157-01 | | 50,953 | - |
| Bacterial Determinants of Treatment Response in Mycobacteria Tuberculosis | 93.855 | 1U19AI142793-01 REVISED | | 1,488,668 | 389,385 |
| Bacteriology PhD Training Program | 93.855 | 5T32AI132120-03 | | 367,186 | - |
| Bioenergetic control in immune cell function | 93.855 | 5R21AI131659-02 | | 10,542 | - |
| Biostatistical Methods for Infectious Diseases Study Design | 93.855 | 1F31AI147745-01 | | 30,302 | - |
| Biostatistics/Epidemiology Training Grants in AIDS | 93.855 | 2T32AI007358-31 | | 477,492 | - |
| Biostatistics/Epidemiology Training Grants in AIDS | 93.855 | 5T32AI007358-30Revised | | 52,222 | - |
| Botswana-Harvard School of Public Health AIDS Initiative Partnership CTU | 93.855 | 5UM1AI069456-14 | | 1,927,085 | 1,672,028 |
| Bridging Statistical Inference and Mechanistic Network Models for HIV/AIDS | 93.855 | 1R01AI138901-01A1 | | 230,167 | - |
| Cell envelope synthesis and antibiotic resistance in Staphylococcus aureus | 93.855 | 1F32AI150002-01 REVISED | | 33,180 | - |
| Cell surface biogenesis in Streptococcus pneumoniae | 93.855 | 5R01AI139083-02 | | 375,945 | - |
| Characterization of a novel interaction between intracellular T. cruzi amastigotes and host mitochondria | 93.855 | 5R21AI135520-02 | | 91,889 | - |
| CONTROL AND ACTIVATION OF THE TUMOR NECROSIS FACTOR RECEPTORS | 93.855 | 1R01AI150709-01 | | 120,339 | - |
| Coordinate Regulation of Bacterial Virulence Factors | 93.855 | 5R01AI026289-29 | | 495,804 | - |
| CRISPR/Cas9 based antivirals for treatment of latent and lytic Herpesvirus-1 and -2 infection in vivo | 93.855 | 5R21AI135423-02 | | 215,882 | - |
| Cytotoxic T Cell Mediated Immunity to Chlamydia | 93.855 | 5R01AI039558-23 | | 799,591 | - |
| Decoding the roles of critical genes of unknown function in M. tuberculosis | 93.855 | 5U19AI107774-05Rev | | 117,440 | 103,372 |
| Deep sequencing of pathogens to precisely define transmission networks using rare variants | 93.855 | 5R01AI128344-03 | | 337,118 | 3,708 |
| Defining Features of Bacterial Control in M. tuberculosis Granulomas Using Single-cell mRNA Sequencing | 93.855 | 1F30AI143160-01A1 | | 36,506 | - |
| Defining functional domains of a P. aeruginosa efflux pump using periplasmic nanobodies | 93.855 | 1R21AI153471-01 REVISED | | 8,353 | - |
| Defining regulators of immunity to acute infection using CRISPR screens | 93.855 | 5U19AI133524-03 | | 2,793,238 | 1,935,922 |
| Detecting Infection at Its Onset: The Site of RIG-I Signaling | 93.855 | 5F31AI131469-03 REVISED | | 4,136 | - |
| Determining the interactions between mosquito oogenesis and Plasmodium falciparum survival and transmission | 93.855 | 1R01AI153404-01 | | 14,516 | - |
| Developing a microfluidic platform for single virus genomics and virus discovery | 93.855 | 5R21AI128623-02 | | 25,705 | 22,926 |
| Developing comparative chemical genomics and genetic validation tools for Babesia spp. | 93.855 | 1R21AI153945-01 | | 15,570 | - |
| Discovery and characterization of new bacterial cell wall targets and inhibitors to treat resistant infections | 93.855 | 1R01AI148752-01 REVISED | | 446,289 | - |
| Disentangling the Death Decision: How Living Cells Release Interleukin-1 | 93.855 | 5F31AI138369-02 | | 31,246 | - |
| Doctoral Training Program in Tropical Diseases | 93.855 | 5T32AI049928-15 | | 92,705 | - |
| Dynamic Strategies for the clinical management of HIV disease | 93.855 | 5R37AI102634-07 | | 652,525 | - |
| Early Infant Treatment | 93.855 | 4U01AI114235-06 | | 88,792 | 70,476 |
| Early Infant Treatment | 93.855 | 5U01AI114235-05 | | 73,470 | 58,544 |
| Ecological and genetic contributions to the spread of resistance in pneumococcus | 93.855 | 5R01AI106786-05 REVISED | | 359,542 | - |
| Elucidating ligand-receptor interactions required for Plasmodium vivax blood-stage infection | 93.855 | 5R01AI140751-02 | | 398,231 | - |
| Elucidating novel mechanisms controlling cell envelope biogenesis in Streptococcus Pneumoniae | 93.855 | 5F32AI136431-03 | | 65,158 | - |
| Elucidating the Structural Requirements for Next-Gen Glycoconjugate Vaccines | 93.855 | 1R01AI148273-01 | | 279,611 | - |
| Epidemiology of Infectious Diseases | 93.855 | 5T32AI007535-20 | | 162,193 | - |
| Expansion of research and mentoring to improve birth outcomes and treatment outcomes among HIV-affected children in Botswana | 93.855 | 5K24AI131924-03 | | 163,560 | 17,207 |
| Exploring metabolic resistance to small molecule inhibitors in Trypanosoma cruzi | 93.855 | 1R21AI146815-01 | | 176,792 | - |
| Exploring the roles of acquired immunity and functional constraint in sculpting malaria antigenic diversity in a longitudinal cohort | 93.855 | 5R01AI141544-02 | | 394,335 | - |
| Forward genetic overexpression screens to identify parasite determinants of antimalarial susceptibility | 93.855 | 5R21AI139973-02 | | 211,348 | - |
| Functional analysis of epigenetic regulators of malaria blood-stage proliferation and transmission | 93.855 | 5R01AI138551-03 | | 426,995 | - |
| Functional regulation of an arenavirus polymerase by the viral matrix protein and RNA ligands | 93.855 | 5F31AI133689-02 | | 32,153 | - |
| Generation and Function of NK Cell Memory (Project 1 - Disaggregated project) | 93.855 | 5R01AI111595-05 | | 51,019 | - |
| Genetic Analysis of Toxinogenesis in Vibrio Cholerae | 93.855 | 2R37AI018045-39 REVISED | | 1,020,672 | - |
| Genetic Analysis of Toxinogenesis in Vibrio Cholerae | 93.855 | 5R01AI018045-38 | | (1,800) | - |
| Genetically-encoded fluorescent RNA sensors for measuring transport of antibiotics into the cytoplasm of Gram-negative pathogens and development of efflux pump inhibitors | 93.855 | 5R01AI136789-03 | | 955,031 | 262,484 |
| Genomics approaches to elucidating pathways to antibiotic resistance in Neisseria gonorrhoeae | 93.855 | 5R01AI132606-03 | | 347,091 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Harvard University Center for AIDS Research | 93.855 | 2P30AI060354-16 REVISED | | 2,369,253 | 1,035,342 |
| Harvard University Center for AIDS Research | 93.855 | 5P30AI060354-15 | | 1,246,387 | 1,138,965 |
| HIV cure studies: risk, risk perception, and ethics | 93.855 | 5R01AI114617-05 | | 369,040 | 331,385 |
| How Hepatitis C Virus Regulates Desmosterol to Affect RNA Replication: a New Virus-Host Interaction | 93.855 | 1R21AI148972-01 | | 59,176 | - |
| Human Cytomegalovirus Nuclear Egress: Molecular Mechanisms and Drug Targeting | 93.855 | 5R01AI026077-32 REVISED | | 362,008 | - |
| Identification and Inference for Longitudinal Causal Mediation Analysis in HIV Research | 93.855 | 5R01AI104459-05REVISED | | 13,941 | 13,941 |
| Identification of Adipose Tissue Factors that Induce Regulatory iNKT Cells | 93.855 | 5F31AI138353-03 | | 31,912 | - |
| Identifying and validating new antibiotic targets in cell wall synthesis pathways | 93.855 | 4R01AI099144-05 REVISED | | 1,595 | - |
| ImmGen: Gene Expression and Regulation in Immune Cells | 93.855 | 5R24AI072073-13 | | 1,421,250 | 341,147 |
| Immune Mechanisms of Protection against Mycobacterium tuberculosis Center (IMPAc-TB) | 93.855 | 75N93019C00071 | | 2,024,010 | 1,197,294 |
| In vivo role of CTLA-4 in Costimulation and Autoimmunity | 93.855 | 5R01AI040614-20 | | 112,566 | - |
| Incorporation of a histone variant into viral chromatin to promote herpes simplex virus replication | 93.855 | 1F31AI145062-01 | | 25,990 | - |
| Innovative Platforms for Antimicrobial Therapy and Vaccine Development | 93.855 | 5U19AI109764-05 REVISED | | 17,372 | - |
| Integrated discovery and development of innovative TB Diagnostics | 93.855 | 5U19AI109755-05 REVISED | | 928,250 | 383,590 |
| Interferon-induced IFITM recruitment of ZMPSTE24 blocks viral endocytic entry | 93.855 | 5R01AI121288-04 | | 222,802 | - |
| Investigating Cell-Wall Synthesis in Mycobacterium abscessus | 93.855 | 1F31AI149932-01 REVISED | | 16,782 | - |
| Malaria Genomic Epidemiology for Identifying Sources of Malaria Infection and Transmission | 93.855 | 5R21AI141843-02 | | 95,010 | - |
| Malaria transmission blocking through mosquito contact with treated surfaces | 93.855 | 1R01AI148646-01 | | 124,719 | - |
| Mechanisms and Immunological consequences of Host-Virus Interactions | 93.855 | 5P01AI112521-05 | | 1,345,505 | 186,574 |
| Mechanisms of itch and neural regulation of inflammation in S. aureus infection | 93.855 | 5F31AI138384-02 | | 31,246 | - |
| Mechanisms regulating vimentin-dependent invasion of the brain by Listeria monocytogenes | 93.855 | 1R01AI146102-01 | | 269,965 | 63,080 |
| Methods to Advance the HIV Prevention Research Agenda | 93.855 | 5R37AI051164-17 | | 280,587 | 117,533 |
| Molecular Basis of Viral Infectivity | 93.855 | 2T32AI007245-36 REVISED | | 261,206 | - |
| Molecular Basis of Viral Infectivity | 93.855 | 5T32AI007245-35 REVISED | | 195,168 | - |
| Molecular biology of trichomonasviruses | 93.855 | 5R01AI132445-03 | | 411,286 | - |
| Molecular Genetics of HSV DNA Polymerase Gene | 93.855 | 2R56AI019838-31 REVISED | | 93,644 | - |
| Naive T cell homeostasis: Treg selection and survival | 93.855 | 5R37AI051530-16 | | 15,387 | - |
| Novel Genetic Mechanism of Artemisinin Resistance for Malaria | 93.855 | 5R01AI099105-06 | | 769,495 | - |
| Novel Nutrient-sensing Pathway Suppresses Pathologic Tissue Remodeling | 93.855 | 5R21AI142343-02 | | 309,453 | - |
| Novel Statistical Methods for Cluster-Randomized HIV Prevention Trials | 93.855 | 5F31AI141030-02 | | 30,872 | - |
| Nuclear Sensing of Herpesviral DNA | 93.855 | 5R01AI106934-06 | | 252,223 | - |
| Optimal targeting for individual and population-level TB prevention | 93.855 | 1R01AI146555-01A1 | | 41,495 | 3,804 |
| Outer Membrane Biogenesis: New Antibiotic Targets | 93.855 | 5R01AI081059-12 | | 711,343 | - |
| Pain and Neuro-immune Signaling in S. pyogenes pathogenesis | 93.855 | 5R01AI130019-03 | | 669,928 | 234,038 |
| Peptidoglycan Biogenesis in Escherichia Coli | 93.855 | 2R01AI083365-11 | | 250,071 | - |
| Peptidoglycan Biogenesis in Escherichia Coli | 93.855 | 5R01AI083365-10 | | 374,766 | - |
| Plasma Gelsolin as Immunotherapeutic for Antibiotic-Resistant Pneumonia | 93.855 | 5R01AI125152-03REVISED | | 58,130 | 45,598 |
| Poliovirus Cell Entry Pathways | 93.855 | 5R01AI020566-34 | | (30,453) | - |
| Regulation of HLA-C in Human Trophoblasts and its Impact on Preterm Birth | 93.855 | 5R21AI138019-02 | | 197,463 | - |
| Proline homeostasis: a novel mediator of drug tolerance in Plasmodium falciparum | 93.855 | 1R01AI143723-01A1 | | 99,879 | 31,079 |
| Release of Extracellular DNA during Biofilm Formation in Staphylococcus aureus | 93.855 | 5R01AI139011-02 | | 694,766 | - |
| Repair of Incorporated Ganciclovir During Drug-Resistant Human Cytomegalovirus Replication | 93.855 | 5R03AI140048-02 | | 85,443 | - |
| RNA Processing in Non-Segmented Minus-Strand RNA Viruses | 93.855 | 5R37AI059371-15 REVISED | | 290,608 | - |
| Role of host fatty acid metabolism in Trypanosoma cruzi amastigote growth | 93.855 | 5R01AI114622-05 | | 351,585 | - |
| Role of regulatory T cell-derived Tgf-beta1 in oral tolerance | 93.855 | 5F31AI138356-02 | | 29,756 | - |
| SDMC - IMPAACT Leadership Group | 93.855 | 5UM1AI068616-14REVISED | | 10,976,036 | 4,916,006 |
| Sensory Transduction in Bacterial Chemotaxis | 93.855 | 5R01AI016478-40 | | 658,096 | - |
| Small Molecule Inhibitors of Enveloped Virus Entry | 93.855 | 5U19AI109740-05 REVISED | | 75,557 | 75,557 |
| Social Epidemiology of Ebola Virus Disease | 93.855 | 1K08AI139361-01A1 | | 160,758 | - |
| Specification of Treg cells: FOXP3 functional facets | 93.855 | 5R01AI116834-05 | | 263,827 | - |
| Statistical and Data Management Center (SDMC), AIDS Clinical Trials Group | 93.855 | 5UM1AI068634-14REVISED | | 15,862,937 | 7,298,413 |
| Strengthening evidence on optimal multidrug-resistant tuberculosis treatment regimens through improved epidemiologic methods | 93.855 | 1R01AI146095-01A1 | | 38,785 | - |
| Structural Basis of Immune Cell Receptor Function | 93.855 | 5R01AI037581-24 | | 485,755 | - |
| Structural studies of herpesvirus DNA polymerases | 93.855 | 5R21AI141940-02 | | 229,893 | - |
| Studies on the Biological Mechanisms of Antibiotics | 93.855 | 9R01AI149778-17 | | 461,588 | - |
| T Cell Costimulatory Pathways: Functions and Interactions | 93.855 | 2P01AI056299-16 REVISED | | 1,950,710 | 1,126,983 |
| T Cell Costimulatory Pathways: Functions and Interactions | 93.855 | 5P01AI056299-15 REVISED | | 1,632,205 | 814,712 |
| T regulatory cell subsets at the microbial interface: determinism and function | 93.855 | 5R01AI125603-03 | | 362,117 | - |
| Targeting cell separation systems of gram-negative bacteria | 93.855 | 5R33AI111713-05 | | 137,306 | - |
| Targeting Membrane Transport Steps in Cell Envelope Assembly | 93.855 | 1R01AI153358-01 | | 34,594 | - |
| Targeting steroid hormone signaling in Anopheles mosquitoes for malaria control | 93.855 | 5R01AI124165-04 | | 685,236 | 81,119 |
| Targeting the Mitochondrion of P. falciparum | 93.855 | 5R01AI093716-08 | | 365,931 | 130,478 |
| The Graduate Program in Tropical Infectious Diseases (GPiTID) | 93.855 | 2T32AI049928-16 | | 6,268 | - |
| The molecular mechanism of Aire | 93.855 | 5R01AI088204-08 | | 282,797 | - |
| The role of Fc function in broadly neutralizing antibody efficacy against HIV | 93.855 | 5F31AI131747-03 | | 30,953 | - |
| The Role of PI3K in the Maintenance and Function of T Follicular Regulatory Cells | 93.855 | 5F31AI126687-03 | | 17,565 | - |
| The Role of the Nuclear Envelope in Antiviral Signaling and HSV-1 Restriction | 93.855 | 5F31AI129207-03 | | 30,912 | - |
| The translation apparatus of Leishmania: from basic analysis to pursuit of novel drug targets | 93.855 | 5R01AI108718-04 | | (2,228) | - |
| Training Program in Immunological Tolerance and Autoimmunity | 93.855 | 5T32AI118692-05 | | 174,138 | - |
| Treg cell diversity and homeostatic control | 93.855 | 1R01AI150686-01 | | 60,880 | - |
| Using agent-based modeling to estimate the effectiveness of the Miami Getting to Zero HIV campaign | 93.855 | 5K01AI138863-03 | | 110,734 | - |

**Harvard University**
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**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Validating the Flavivirus Envelope Protein as an Antiviral Target | 93.855 | 1R01AI146152-01A1 | | 167,301 | - |
| Viral and host mechanisms that tilt the HSV lytic/latent balance | 93.855 | 2 P01 AI098681-06A1 | | 1,441,933 | 307,337 |
| Viral and host mechanisms that tilt the HSV lytic/latent balance | 93.855 | 5P01AI098681-05 | | 20,692 | 5,081 |
| Zika Virus in Pregnancy in Nigeria | 93.855 | 5R21AI137840-02 | | 153,808 | 42,660 |
| **Total for CFDA 93.855** | | | | 73,459,661 | 26,085,209 |
| A Dual Catalytic Strategy for Enantioselective Pyridinium Photochemistry | 93.859 | 5F32GM125187-02 REVISED | | 2,553 | - |
| A synchronized circadian clock in gut bacteria, using control theory | 93.859 | 5F32GM125108-03 | | 58,417 | - |
| Advanced Tools for Reconstructing Population History | 93.859 | 5R01GM100233-08 | | 290,963 | - |
| Advancing Multiplexed Isobaric Tag-based Strategies for Proteome Profiling | 93.859 | 1R01GM132129-01A1 | | 234,200 | - |
| Aggression in Drosophila: circuitry involved; learning and memory accompanying aggression; and establishing the circuitry of high-level aggression in the brain | 93.859 | 5R35GM118137-04 | | 675,508 | - |
| Amyloid aggregation and prion formation in bacteria | 93.859 | 5R01GM115941-04 | | 463,403 | - |
| Analysis of the Essential Transcription Factors Spt5 and Spn1/Iws1 | 93.859 | 3R01GM120038-03S1 | | 625,168 | - |
| Asymmetric Nucleophilic Aromatic Substitution Enabled by Hydrogen-Bonding Catalysis | 93.859 | 1F32GM136042-01 REVISED | | 31,041 | - |
| Bayesian Methods for Comparative Effectiveness Research with Observational Data | 93.859 | 5R01GM111339-04 REVISED | | 187,792 | - |
| Biochemical characterization of LMW PBPS with novel transpeptidase activity | 93.859 | 5F32GM123579-03 REVISED | | (5) | - |
| Biochemical Studies of Mitosis | 93.859 | 5R01GM026875-42 | | 443,862 | - |
| Bioinformatics and Chemical Biology Approaches for Identifying Bioactive Natural Products of Symbiotic Actinobacteria | 93.859 | 1F32GM128267-02 | | 60,246 | - |
| Biophysical mechanisms of proteomic and fitness effects of synonymous substitutions | 93.859 | 5R01GM124044-03 | | 385,939 | - |
| Biophysics of Nuclear Formation and Micronucleation | 93.859 | 1F32GM131585-01A1 | | 49,963 | - |
| Broadly Applicable, Small Molecule Catalysts for Stereoselective and Site-Selective Glycosylation Reactions | 93.859 | 5R01GM132571-02 | | 344,552 | - |
| Calibration and Simulation of the Botswana Combination Prevention Project | 93.859 | 5R01GM116525-03 | | (1,816) | - |
| Cell and Chemical Biology of Microtubules | 93.859 | 1R35GM131753-01 | | 519,124 | - |
| Cell Envelope Homeostasis in Bacillus subtilis | 93.859 | 5R01GM127399-02 REVISED | | 326,652 | - |
| Characterizing the O-GlcNAc Transferase Tetratricopeptide Repeat Domain's Role in Substrate Selection | 93.859 | 1F32GM129889-01A1 | | 56,638 | - |
| Chiral Catalysts Designed to Catalyze Organic Reactions | 93.859 | 3R01GM043214-29S1 | | 369,753 | - |
| Chiral Complexes Designed to Catalyzed Organic Reactions | 93.859 | 2R01GM043214-30 | | 577,407 | - |
| Chromosome Dynamics in Bacillus Subtills | 93.859 | 5R01GM086466-10 | | 485,822 | - |
| Controlling Radicals via Sulfonium Activation and Anion Binding Catalysis | 93.859 | 1F32GM133068-01 | | 59,136 | - |
| Correlation of electronic structure to iron catalyzed C-H bond functionalization | 93.859 | 5R01GM115815-04 REVISED | | 1,139 | - |
| Chromosome organization and function in time and space: meiosis, mitosis and E.coli | 93.859 | 1R35GM136322-01 | | 18,759 | - |
| Complementary Activation of Hydroxylamine Derivatives by Hydrogen-Bond Donor Catalysts to Enable Enantioselective Nitrogen-Atom Transfer Processes | 93.859 | 1F32GM137576-01 | | 5,070 | - |
| Decoding chromosome structure with multiplexed super-resolution microscopy | 93.859 | 5R01GM124401-02 | | 501,425 | - |
| Decoding ribosome-triggered quality control mechanisms | 93.859 | 1DP2GM137415-01 | | 267,446 | - |
| Defining the cellular functions of the conserved transcription complex Spt6/Iws1 in the control of gene expression | 93.859 | 5F32GM119291-03 | | (187) | - |
| Determine the mechanism of recognition of ubiquitin configurations by the 26S proteasome | 93.859 | 1R01GM134064-01 | | 204,364 | - |
| Determining the source of missing heritability | 93.859 | 5R01GM120122-04 | | 338,702 | - |
| Discovering the regulatory roles of transcription during erythropoiesis, one nucleotide at a time | 93.859 | 5F32GM125238-03 | | 61,624 | - |
| Discovery of Small Molecule Immunomodulators from Disease-Associated Microbiome Members | 93.859 | 5F32GM122233-02 | | 1,294 | - |
| Dissecting the establishment and regulation of human pluripotency | 93.859 | 5P01GM099117-08 | | 1,984,874 | 1,029,774 |
| Diversity in Biomedical Sciences Via Personalized Research and Education Programs for Post-Baccalaureates | 93.859 | 5R25GM109436-04 | | 222,537 | - |
| DNA-corralled nanodiscs for study of large membrane proteins and their complexes | 93.859 | 5R01GM131401-02 | | 402,984 | 231,988 |
| Drosophila Transgenic RNAi Resource Project | 93.859 | 5R01GM084947-12 | | 382,845 | - |
| Dual Hydrogen-Bond Donor and Cation-π Catalysis: Enantioselective Cycloadditions of Strained Donor-Acceptor Ring Systems | 93.859 | 5F32GM126636-03 REVISED | | 61,642 | - |
| Dynamic regulatory mechanisms of robust pattern formation in the neural tube | 93.859 | 2R01GM107733-05 | | 163,402 | - |
| Dynamic regulatory mechanisms of robust pattern formation in the neural tube | 93.859 | 5R01GM107733-04 REVISED | | 9,833 | - |
| Dynamics of Cellular Senescence in Single Cells | 93.859 | 5R01GM116864-04 REVISED | | 309,730 | - |
| Dynamics of Signaling Pathways: Mechanism and Function | 93.859 | 3R01GM083303-12S1 | | 402,605 | - |
| Elucidating a physiological role for ARRDC-1 Mediated Microvesicles (ARMMs): A versatile platform for the delivery of biological therapeutics | 93.859 | 5F31GM131567-02REVISED | | 31,869 | - |
| Elucidating the role of an immunomodulator from a gut microbe in inflammatory bowel disease | 93.859 | 5F32GM126650-03 | | 61,753 | - |
| Enhancement of Protein Breakdown through PKG-mediated Phosphorylation of the Proteasome | 93.859 | 5F32GM128322-02 | | 61,444 | - |
| Enhancing Diversity in Academic Medicine through Faculty Networks | 93.859 | 5R01GM111563-04 REVISED | | 99,422 | - |
| Epigenetic Inheritance of Heterochromatin | 93.859 | 5R01GM072805-15 | | 372,386 | - |
| Evolutionary Tradeoffs in Antibiotic Resistance | 93.859 | 1R35GM133700-01 | | 458,254 | - |
| Feedback Control of the Cell Cycle | 93.859 | 5R01GM043987-28 | | 164,108 | - |
| Function and mechanism of the HCV p7 channel and its therapeutic potential | 93.859 | 5R01GM116898-04 | | 234,646 | - |
| Functional characterization of an insulin-like peptide network that regulates learning | 93.859 | 5R01GM108962-04 REVISED | | 20,752 | 15,565 |
| Functional Genomic Analysis by RNAi Screening in Drosophila Cells | 93.859 | 5R01GM067761-16 REVISED | | 11,592 | - |
| Functional genomics resources for the Drosophila and broader research communities | 93.859 | 1P41GM132087-01 | | 1,123,714 | - |
| Furshpan and Potter Native American High School Summer Program | 93.859 | 5R25GM129830-02 | | 120,896 | - |
| Genetic Mechanisms of Axis Formation in Vertebrates | 93.859 | 5R37GM056211-21 REVISED | | 206,352 | - |
| Genetics and Genomics PhD Training Grant | 93.859 | 5T32GM096911-09 | | 285,968 | - |
| Harvard Chemical Biology Graduate Program | 93.859 | 3T32GM095450-09S1 | | 519,699 | - |
| Harvard Systems Biology Graduate Program | 93.859 | 5T32GM080177-10 | | 284,148 | - |
| High Resolution Analysis of Transcription-Splicing Coupling | 93.859 | 5R01GM117333-04 | | 465,377 | - |
| High-throughput optimization of genetically-encoded fluorescent biosensors | 93.859 | 5R01GM124038-03 | | 371,789 | - |
| HMS Laboratory of Systems Pharmacology | 93.859 | 5P50GM107618-05 | | 230,358 | 40,109 |
| Human microbiome metabolites in health and disease | 93.859 | 1R35GM128618-02 | | 392,898 | - |
| Illegitimate Recombination by Drug Resistance Elements | 93.859 | 5R01GM025326-39 | | 442,499 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
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| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Illuminating molecular mechanisms of cellular functions by single-molecule and super-resolution imaging | 93.859 | 5R35GM122487-03 | | 352,239 | - |
| Information Integration and Energy Expenditure in Eukaryotic Gene Regulation | 93.859 | 5R01GM122928-03 | | 502,759 | - |
| Information Processing by Post-translational Modification | 93.859 | 2R01GM105375-05 | | 222,994 | 41,087 |
| Interdisciplinary training: Statistical Genetics/Genomics and Computational Biology | 93.859 | 5T32GM074897-15 | | 327,242 | - |
| Joint Program in Molecules, Cells and Organisms | 93.859 | 3T32GM007598-41S1 | | 519,497 | - |
| Kinetic control of transcription in animals | 93.859 | 5F32GM128310-02 | | 44,927 | - |
| Limits and trade-offs of feedback control | 93.859 | 5R01GM081563-09 | | 140,157 | - |
| Mapping Structure-Activity Relationships of Chemical Inhibitors via Genome- Editing | 93.859 | 1DP2GM137494-01 | | 288,365 | - |
| Mapping the assembly pathways for viral capsids by direct single-particle measurements | 93.859 | 5K99GM127751-02 | | 84,600 | - |
| Mapping vertebrate differentiation hierarchies with high-throughput single cell transcriptomics | 93.859 | 5K99GM121852-02 REVISED | | 3,112 | - |
| Maximizing Investigator's Research Award | 93.859 | 5R35GM127136-02 | | 424,856 | - |
| Measuring and modeling the dynamics of patterning in human stem cells | 93.859 | 5R01GM131105-02 | | 267,295 | - |
| Mechanism and Inhibition of Enzymes that Assemble Bacterial Cell Wall | 93.859 | 5R01GM076710-12 | | 114,251 | - |
| Mechanism of Divalent Metal Transport by NRamp-Family Transporters | 93.859 | 5R01GM120996-04 | | 445,574 | - |
| Mechanism of NEIL3-dependent ICL repair | 93.859 | 5K99GM129422-02 | | 92,801 | - |
| Mechanism of yeast gene regulation | 93.859 | 1R35GM131801-01 | | 659,741 | - |
| Mechanisms of Lipid Droplet Formation | 93.859 | 5R01GM124348-03 | | 436,679 | - |
| Mechanisms of Lipid Droplet Protein Targeting | 93.859 | 5R01GM097194-10REVISED | | 440,148 | 44,361 |
| Mechanisms of Selective Autophagy | 93.859 | 5R01GM095567-08 REVISED | | 47,943 | - |
| Mechanisms of yeast transcriptional initiation | 93.859 | 5R01GM030186-37 | | 294,568 | - |
| Mechanistic Analysis of the Ubiquitin-Proteasome System | 93.859 | 5R35GM127032-02 | | 334,975 | - |
| Mechanistic and proteomic studies of a proteasome-associated ubiquitin ligase | 93.859 | 5F32GM125355-02 | | 9,778 | - |
| Medical Scientist Training Program | 93.859 | 3T32GM007753-41S1 | | 2,623,021 | - |
| Meiotic Chromosome Synapsis and Recombination in Yeast | 93.859 | 5R01GM044794-29 | | 328,916 | - |
| Microbial Adaptation and the Statistics of Epistasis and Pleiotropy | 93.859 | 5R01GM104239-07 | | 276,056 | - |
| Microtubule Dynamics and Mitotic Mechanism | 93.859 | 5R01GM039565-31 | | 7,113 | - |
| Microtubule Integrity Response | 93.859 | 3R01GM122784-02S1 | | 410,107 | - |
| MIDAS Center for Communicable Disease Dynamics | 93.859 | 5U54GM088558-10REVISED | | 1,344,568 | 186,295 |
| Modeling individual-to-collective behavior in mound-building termites | 93.859 | 5R01GM112633-05 | | 151,499 | 48,795 |
| Modeling scientific workforce dynamics using social network analysis | 93.859 | 5U01GM112623-04 REVISED | | 57,652 | - |
| Molecular Biophysics Training Grant | 93.859 | 2T32GM008313-31 | | 573,101 | - |
| Molecular Biophysics Training Grant | 93.859 | 5T32GM008313-30 | | (11) | - |
| Molecular Chaperones and Protein Degradation | 93.859 | 5R01GM051923-23 | | 416,298 | - |
| Molecular Genetic Analysis of Extracellular RNAs in C. elegans | 93.859 | 5R01GM089795-10 | | 451,539 | - |
| Molecular Genetics of the Bithorax Complex | 93.859 | 5R01GM028630-31 REVISED | | 79,389 | - |
| Molecular mechanisms by which mild elevation of mitochondrial superoxide extends lifespan | 93.859 | 1R01GM121756-01 | | 184,436 | - |
| Molecular Mechanisms of Lipopolysaccharide Transport Driven by ABC Transporters | 93.859 | 5R01GM122797-03 | | 382,637 | - |
| Molecular mechanisms of sigma receptor signaling | 93.859 | 5R01GM119185-03 | | 285,429 | - |
| Molecular mechanisms of spore germination | 93.859 | 5F32GM130003-02 | | 61,103 | - |
| Molecular, Cellular and Developmental Dynamics PhD Program | 93.859 | 5T32GM007226-44 | | 848,730 | - |
| mRNA Capping Enzyme | 93.859 | 2R01GM056663-21 | | 577,932 | 9,680 |
| mRNA Capping Enzyme | 93.859 | 5R01GM056663-20 | | 2,161 | - |
| Multiscale study of the phenotypic consequences of protein folding intermediates in dihydrofolate reductase | 93.859 | 5F32GM126651-02 | | 56,704 | - |
| New and Disruptive Technologies to Study Ubiquitin Biology through Sample Multiplexing | 93.859 | 5R01GM067945-16 | | 460,386 | - |
| New approaches to measuring and containing the spatial spread of human pathogens | 93.859 | 5R35GM124715-03 | | 304,345 | - |
| Next Generation Solution NMR Techniques for GPCR Structure, Dynamics and Function | 93.859 | 5R01GM129026-02 | | 572,371 | - |
| Noise, memory, and adaptation in the flagellum system in E.coli. | 93.859 | 1R01GM134275-01 | | 204,939 | - |
| Novel platforms for development of optimized genetically encoded fluorescent biosensors | 93.859 | 5F32GM123577-03 | | 47,722 | - |
| Nuclear-mitochondrial co-regulation during mitochondrial biogenesis | 93.859 | 5R01GM123002-03 | | 301,862 | - |
| Polynuclear iron complexes as functional mimics of the nitrogenase FeMo-cofactor | 93.859 | 5R01GM098395-08 | | 217,567 | - |
| Predictive biophysical models of evolution | 93.859 | 5R01GM068670-16 REVISED | | 555,722 | - |
| Prions in the bacterial domain of life | 93.859 | 1R35GM136247-01 | | 121,642 | - |
| Probing the specificity and activity of the metazoan Integrator complex | 93.859 | 1R01GM134539-01 | | 561,139 | 240,802 |
| Protein Transport Across Membranes | 93.859 | 2R01GM052586-25 | | 579,297 | - |
| Proton Coupled Electron Transfer Mechanism of Ribonucleotide Reductase | 93.859 | 5R01GM047274-28 REVISED | | 177,584 | - |
| Reconstituting heterochromatin and gene silencing in vivo | 93.859 | 5F32GM131438-02 REVISED | | 51,572 | - |
| Reconstitution of heterochromatin and gene silencing in vivo | 93.859 | 1K99GM137045-01 | | 19,506 | - |
| Regulation of translesion synthesis by the bacterial replisome | 93.859 | 5R01GM114065-05 | | 252,967 | - |
| RNA Processing Machines in Biology and Disease | 93.859 | 5R35GM122524-03 | | 467,419 | - |
| Role of RNA polymerase in bacterial differentiation | 93.859 | 5R01GM018568-46 REVISED | | 47,384 | - |
| Salamander Models in Cross-Disciplinary Biological Research | 93.859 | 1R13GM134644-01 | | 1,398 | - |
| Sending and receiving Hedgehog signals | 93.859 | 5R01GM122920-02 | | 362,329 | - |
| Small regulatory RNA functions in the nucleus | 93.859 | 2R01GM088289-10A1 | | 323,365 | - |
| Spatiotemporal Regulation of Liquid-like Condensates in the Germline | 93.859 | 5R01GM132286-02 | | 333,330 | - |
| Structural and Kinetic Characterization of the Flavivirus Membrane Fusion Mechanism | 93.859 | 1F32GM129940-01 | | 22,995 | - |
| Structure of Sphingosine 1-phosphate Receptors | 93.859 | 1F32GM136092-01 REVISED | | 30,606 | - |
| Structure, Function and Inhibition of Human O-GlcNAc Transferase | 93.859 | 5R01GM094263-08 | | 252,885 | - |
| Studies on the Biological Mechanisms of Antibiotics | 93.859 | 5R01GM066174-16 REVISED | | (564) | - |
| Studying the mitochondrial motor/adaptor complex by misdirecting it to peroxisomes | 93.859 | 5F31GM126681-02 | | 32,153 | - |
| Substrate recognition and processing by the proteasome | 93.859 | 5R01GM043601-27 REVISED | | 442,881 | - |
| Synaptonemal complex assembly and function in meiosis | 93.859 | 2R01GM072551-14 | | 382,241 | 13,611 |

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| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Synaptonemal complex assembly and function in meiosis | 93.859 | 5R01GM072551-13 REVISED | | 75,996 | - |
| Systematic elucidation of allele specific proteome at Imprint Control Regions | 93.859 | 1R01GM135377-01 | | 14,775 | - |
| Technologies for visualizing the genome in situ | 93.859 | 5R01GM123289-03 | | 689,650 | - |
| The 3D architecture of the mitochondrial nucleoid and its role in organelle regulation | 93.859 | 5F32GM130028-02 | | 59,342 | - |
| The biosynthesis of N–N bond-containing natural products | 93.859 | 1R01GM132564-01A1 | | 82,128 | - |
| The first secreted Tyrosine kinase | 93.859 | 5R01GM115417-04 REVISED | | 69,151 | 8,450 |
| The genetic mechanisms and dependent pathways of insulin/IGF-like signaling that contribute to ovariole number in the Drosophila ovary | 93.859 | 5F32GM119299-03 REVISED | | 6,969 | - |
| The mechanism of vertebrate DNA replication termination | 93.859 | 5R01GM080676-12 | | 407,534 | - |
| The molecular mechanism of relaxin receptor signaling | 93.859 | 5F31GM128233-02 | | 32,278 | - |
| The of Role DNA LigIV and Its Accessory Factors in the NHEJ Synaptic Complex | 93.859 | 5F32GM129913-02 | | 61,264 | - |
| The RNA polymerase II transcription complex | 93.859 | 5R01GM046498-28 | | 412,689 | 11,827 |
| Training in Pharmacological Sciences | 93.859 | 1T32GM132089-01 | | 378,410 | - |
| Training in Pharmacological Sciences | 93.859 | 5T32GM007306-43 REVISED | | 3,973 | - |
| Using a new regenerative model system to elucidate mechanisms for stem cell regulation | 93.859 | 5R35GM128817-02 | | 252,448 | - |
| Visualizing DNA break repair: single-molecule studies of non-homologous end joining | 93.859 | 2R01GM115487-05 | | 19,556 | - |
| Visualizing DNA break repair: single-molecule studies of non-homologous end joining | 93.859 | 5R01GM115487-04 | | 206,438 | - |
| **Total for CFDA 93.859** | | | | 42,618,855 | 1,922,344 |
| A population-based online study of the transition of young adults with perinatal HIV infection to adult clinical care | 93.865 | 5R01HD089853-04 | | 334,700 | 45,152 |
| Angiotensin receptor blocking antibody fragments as next-generation therapeutics for preeclampsia | 93.865 | 1R21HD101596-01 | | 34,185 | - |
| Archiving and Documenting Health and Human Development Data Sets from | 93.865 | 1R03HD094985-01A1 REVISED | | (2,387) | - |
| Birth Outcomes Surveillance in Botswana | 93.865 | 5R01HD080471-05 | | 139,902 | 137,261 |
| Botswana Birth Outcomes Surveillance Extension | 93.865 | 5R01HD095766-02REVISED | | 859,646 | 648,930 |
| Causal Event Categories in Infancy: The Origins and Consequences of Causal Perception | 93.865 | 5F32HD089595-03 | | 4,615 | - |
| Chemically Modified Peptide Agents for Next-Generation Conjugate Therapies to Treat Duchenne Muscular Dystrophy | 93.865 | 5F30HD093358-04 | | 48,541 | - |
| Comparative Safety of Non-Insulin Agents in Pregnant Women with Pregestational Diabetes | 93.865 | 1R01HD097778-01A1 | | 375,256 | 106,758 |
| Culling the human genome of disease variants using ultraconserved elements | 93.865 | 5R01HD091797-04 | | 897,196 | 65,836 |
| Descending engagement of brainstem neuronal circuits that govern orofacial motor behaviors | 93.865 | 5K99HD096512-02 | | 67,065 | - |
| Determining lineage decisions and gene regulatory networks governing the generation of key progenitor cell types during early human brain development | 93.865 | 1R01HD100036-01A1 | | 9,986 | - |
| Development and function of a neural circuit underlying sex-specificity of social behaviors | 93.865 | 5K99HD092542-02 REVISED | | 3,719 | - |
| Development of a Modular Soft Exosuit Platform Suitable for Community-Based Neurorehabilitation | 93.865 | 5R01HD088619-04 REVISED | | 837,524 | 181,209 |
| Development of children's language comprehension using ERPs during natural listening | 93.865 | 5R03HD097629-02 REVISED | | 65,111 | - |
| Dissecting the mechanism of epigenetic spreading by targeted degradation of architectural proteins | 93.865 | 1F31HD100109-01 | | 17,565 | - |
| DNA-mediated recording of cellular history | 93.865 | 5DP1HD094764-03 REVISED | | 649,162 | - |
| Elucidating the Role of Metabolism in Regulating the Vertebrate Segmentation Clock | 93.865 | 1F31HD100033-01 | | 25,907 | - |
| Embryonic gene regulatory networks from spatially resolved transcriptomes | 93.865 | 5R01HD085905-04 | | 477,525 | - |
| Error Correction in Early Embryos | 93.865 | 5K99HD091291-02 REVISED | | 3,899 | - |
| Finding Genes for Infertility through the Developmental Genome Anatomy Project | 93.865 | 5F31HD090780-02 REVISED | | (113) | - |
| Genetic regulation of ovariole development in Drosophila | 93.865 | 5R01HD073499-05 | | (1,300) | - |
| Genetics of long non-coding RNAs in zebrafish | 93.865 | 5R01HD076708-05 REVISED | | 191,312 | - |
| Global investigation of cell trajectory and lineage relationships in the vertebrate brain with single-cell transcriptomics | 93.865 | 1K99HD098298-01A1 | | 87,445 | - |
| How infants use the affiliations of their caregivers to evaluate others | 93.865 | 1F32HD096829-01 REVISED | | 2,383 | - |
| IDENTIFYING ROADBLOCKS TO LIMB REGENERATION | 93.865 | 1R01HD095494-01A1 | | 321,768 | - |
| Identifying the role of dynamic ECM-derived forces in zebrafish semicircular canal morphogenesis | 93.865 | 1K99HD098918-01 | | 101,741 | - |
| Integrating Forces and Signals in Tissue-Level Patterning of the Developing Digestive Tract | 93.865 | 5R01HD087234-05 | | 365,867 | - |
| Integration of Mechanical Forces and Signaling in the Morphogenesis of the Gut | 93.865 | 5R01HD089934-04 | | 409,894 | - |
| Long-term health consequences of birth by cesarean section | 93.865 | 5R01HD093761-02 | | 825,581 | 376,732 |
| Mapping the signaling landscape of vertebrate development at single cell resolution | 93.865 | 5R01HD096755-02 | | 583,859 | - |
| Maternal Exposure to Childhood Abuse and Disparities in Offspring Neurodevelopment: Identifying Mechanisms | 93.865 | 1R01HD094725-01A1 | | 306,782 | 148,369 |
| Mechanisms of Morphogen Transport and Interpretation in Early Embryos | 93.865 | 5K99HD097297-02 | | 98,061 | - |
| Metabolic control of global gene expression during the Maternal-to-Zygotic Transition | 93.865 | 5F32HD095590-02 REVISED | | 53,163 | - |
| Microcircuits underlying murine parental behavior | 93.865 | 5R01HD082131-05 | | 242,079 | - |
| Pediatric HIV/AIDS Cohort Study (PHACS) Data and Operations Center | 93.865 | 5U01HD052102-15 REVISED | | 20,023,636 | 16,451,733 |
| Predictive coding in typical speech perception and dyslexia | 93.865 | 1F31HD100101-01A1 | | 17,565 | - |
| Pregnancy Registries Nested in International Pooled Health Care Databases | 93.865 | 1R21HD092879 - 01 | | 47,817 | 47,817 |
| Proteomics of Cell Signaling in Embryogenesis | 93.865 | 5R01HD091846-08 | | 492,450 | - |
| Recapitulating the Placental Microenvironment to Improve Models of the Maternal-Fetal Barrier for Toxicity Screening | 93.865 | 5F31HD095594-02 | | 31,759 | - |
| SCH: Flexible Electronics For Assessment fo Planning By Children Born Prematurely | 93.865 | 5R01HD090985-04 | | 458,533 | 65,695 |
| Social determinants of corticolimbic development and aggressive behavior | 93.865 | 5F31HD096820-02 | | 32,301 | - |
| Systems Analysis of cell type differentiation in Xenopus development | 93.865 | 5R01HD073104-08 | | 581,851 | 10,654 |
| The biophysical and genetic basis of robust pattern formation and morphogenesis in zebrafish spinal cord | 93.865 | 5K99HD092623-02 REVISED | | 56,597 | - |
| The Development and Nature of the Processes that Underlie the Representation of Center-embedded, Recursive Structures | 93.865 | 1F32HD101208-01 | | 44,186 | - |
| The reprogramming of limb progenitor cells | 93.865 | 5R01HD032443-23 | | 453,607 | - |
| The Ventral Medulla and the Sudden Infant Death Syndrome | 93.865 | 5P01HD036379-20 | | 55,045 | 55,045 |
| Trial of Vitamin D in Maternal HIV Progression and Child Health | 93.865 | 5R01HD083113-05 | | 279,397 | 195,940 |
| Uncovering mechanisms and progenitors responsible for limb regeneration | 93.865 | 5F32HD092120-03 | | 79,442 | - |
| **Total for CFDA 93.865** | | | | 31,091,825 | 18,537,131 |
| (R37 Merit Extension) SIRT1 as a regulator of health and lifespan of mammals | 93.866 | 5R37AG028730-14 | | 350,332 | - |
| A Contextual Approach to Understanding Operative Volume and Mortality | 93.866 | 1F32AG064831-01 | | 53,111 | - |
| A New Pathway for Reversing Cardiac Aging | 93.866 | 5R01AG047131-06 | | 193,948 | - |
| Aging Memory | 93.866 | 5R01AG008441-28 REVISED | | 362,718 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Cell Non-autonomous Regulation of Aging via Neuronal TORC1 | 93.866 | 5R01AG059595-02 | | 380,651 | - |
| Characterizing the mechanisms behind the association between purpose in life and health | 93.866 | 5K99AG055696-02 | | 134,966 | - |
| Cognitive Function, Alzheimer's Disease and Related Disorders in the HAALSI Cohort | 93.866 | 5R01AG054066-02 | | 1,000,217 | 550,659 |
| Comparing hospitalization rates, outcomes, and treatment intensity for elderly patients across OECD countries | 93.866 | 1R01AG058878-01A1 REVISED | | 86,848 | - |
| Deciding about Dialysis: Improving Decision-Making Among Older Adults with ESRD | 93.866 | 5K23AG049088-05 | | 118,136 | - |
| Defining Functional Outputs of Mitochondrial Networks in Longevity | 93.866 | 5R21AG056930-02 | | 181,755 | - |
| Dietary methionine restriction as an exercise mimetic via increased muscle oxidative metabolism | 93.866 | 1F31AG064863-01REVISED | | 15,933 | - |
| Disability among Older Low-Skilled Workers | 93.866 | 5R01AG056239-04 | | 342,220 | 130,488 |
| Dissociating Intrinsic and Extrinsic Motor Learning in Alzheimer's Disease | 93.866 | 4R01AG041878-05 REVISED | | (2,637) | - |
| Elucidating SHIP1 in microglia in health and disease | 93.866 | 1F31AG063398-01A1 | | 22,218 | - |
| Elucidating the role of SORL1 as an APOE receptor in human astrocytes | 93.866 | 1F31AG063399-01A1 | | 2,110 | - |
| Examining Trajectories of Lifestyle Factors Associated with Healthy Aging and Longevity Using a Novel Mixture Model | 93.866 | 5R03AG060247-02 | | 96,745 | 21,278 |
| Exploration of MRI measures of neurodegeneration within individuals over short intervals | 93.866 | 1R01AG067420-01 | | 38,472 | - |
| Exploring Mechanisms of Pathogenicity in C9ORF72 Frontotemporal Dementia and Amyotrophic Lateral Sclerosis | 93.866 | 5K99AG057808-02 | | 102,238 | - |
| Frailty, Statins, and Cardiovascular Disease Burden in Older Adults | 93.866 | 5R03AG060169-02 | | 44,141 | 44,141 |
| Frontiers of Aging: From Molecules to Physiology | 93.866 | 1R13AG063483-01 | | 50,000 | 50,000 |
| Gene Therapy for Alzheimer's Disease | 93.866 | 5R21AG059157-02 | | 251,497 | 93,095 |
| Genome Engineering an IPSC Model of Alzheimer's Disease | 93.866 | 1RF1AG048056-01 REVISED | | (9,044) | - |
| Health and Aging in Africa: Longitudinal Studies of an INDEPTH Community | 93.866 | 5P01AG041710-06 REVISED | | 1,706,585 | 721,207 |
| Health and Human Capital over the Life Course | 93.866 | 5R01AG056238-04 | | 529,484 | 404,525 |
| Human Capital of Disabled Workers | 93.866 | 5R01AG046290-06 | | 626,574 | 206,298 |
| Impact of social cohesion on functional recovery after earthquake and tsunami | 93.866 | 5R01AG042463-07 | | 485,372 | 229,685 |
| Improving Medicare in an Era of Change | 93.866 | 2P01AG032952-11 | | 286,190 | - |
| Improving the quality of care provided through bundled payments for patients with Alzheimer's Disease or Other Forms of Dementia or Frailty | 93.866 | 1R01AG060935-01REV | | 688,796 | 252,216 |
| Investigating GDF11 and MSTN as candidate circulating geronic factors | 93.866 | 5R01AG057428-03 | | 452,117 | - |
| Investigating the neuroinflammatory role of RIP1 kinase | 93.866 | 3R01AG047231-05S1 | | 100,214 | - |
| Investigating the role and mechanism of RIPK1 in mediating cerebrovascular pathology of AD | 93.866 | 5R21AG059073-02 | | 104,857 | - |
| MD-PhD Training Program in Aging and the Social/Behavioral Sciences | 93.866 | 5T32AG051108-05 | | 193,712 | - |
| Mechanisms of Intermittent Fasting and Longevity in C. elegans | 93.866 | 1F31AG066458-01 | | 20,746 | - |
| Mechanisms Specific to the Beneficial Effects of Dietary Restriction | 93.866 | 5R01AG044346-05 | | (146) | - |
| Medicare in a Restructured Delivery System | 93.866 | 5P01AG032952-10 REVISED | | 1,274,515 | 178,295 |
| Multifunctional tough adhesive hydrogels to recruit, expand, and deliver tendon cells during aging and injury | 93.866 | 1K99AG065495-01 | | 17,133 | - |
| Myocardial Effects of Caloric Restriction in Primates | 93.866 | 5R03AG059129-02 | | 69,845 | - |
| National Cohort Studies of Alzheimer's Disease, Related Dementias and Air Pollution | 93.866 | 1R01AG066793-01 | | 40,262 | - |
| Neurodegenerative diseases and the role of green space: A deep learning assessment | 93.866 | 1K99AG066949-01REVISED | | 8,983 | - |
| Neuronal Circuit Maintenance in Healthy Aging | 93.866 | 1K99AG064042-01A1 | | 65,019 | - |
| Novel Age-Dependent DNA Modifications | 93.866 | 5R01AG063341-02 REVISED | | 431,741 | 165,057 |
| On-Demand Stem Cell Delivery Systems for Tendon Healing Throughout Aging | 93.866 | 5F32AG057135-03 | | 41,218 | - |
| Optimism and Exceptional Longevity | 93.866 | 5R01AG053273-04 | | 632,133 | 308,628 |
| Post-Acute Care Referral and Outcomes for Patients with Alzheimer's Disease and Related Dementias | 93.866 | 1R56AG062544-01A1 REVISED | | 130,843 | - |
| Regulation and function of Growth Differentiation Factor 11 during development and aging | 93.866 | 3R01AG048917-02S1 | | 376,496 | 16,227 |
| Reversing Loss of Metabolic Homeostasis to Ameliorate Alzheimer's Disease Pathogenicity | 93.866 | 1R01AG067106-01 | | 22,626 | - |
| Role of epigenetic decay in cell senescence and aging | 93.866 | 3R01AG019719-13S1 | | 653,545 | - |
| Single cell RNA-seq analyses of age-related changes in glial cells and in AD | 93.866 | 1RF1AG055521-01A1 REVISED | | 1,117,805 | - |
| Slow-wave activity as a modifier of the progression of neurodegeneration in Alzheimer's disease | 93.866 | 1RF1AG061774-01 REVISED | | 812,725 | 509,562 |
| Studying methionine flux and its role in aging and neurodegeneration | 93.866 | 5K99AG057792-02 REVISED | | 68,996 | - |
| Targeting a Novel Regulator of Brain Aging and Alzheimer's Disease | 93.866 | 5R01AG046174-05 | | 414,120 | 35,898 |
| Targeting RNA homeostasis to promote healthy aging | 93.866 | 5R01AG051954-03 | | 451,110 | - |
| The Center for the Global Demography of Aging | 93.866 | 5P30AG024409-14 REVISED | | 352,297 | - |
| The Changing Landscape of Post-Acute Care and Health Outcomes for Older Adults | 93.866 | 5K23AG058806-02 | | 159,903 | - |
| The Impact of Employee Wellness Programs | 93.866 | 5R01AG050329-04 | | 470,336 | - |
| The Longitudinal Aging Study in India | 93.866 | 3R01AG042778-05S1 | | 361,789 | 205,392 |
| The role of epigenetics in age-related cognitive decline and Alzheimer's disease | 93.866 | 5K99AG055683-02 REVISED | | 47,833 | - |
| Training in the Molecular Biology of Neurodegeneration | 93.866 | 5T32AG000222-28 | | 589,556 | - |
| Transgenerational Inheritance of Protein Aggregates in Animals | 93.866 | 5R21AG061850-02 | | 112,343 | - |
| Ubiquitin-mediated proteolysis and cell cycle control | 93.866 | 5R01AG011085-26 | | 543,634 | 280,904 |
| Uncovering the Human Secretome | 93.866 | 5DP1AG058605-03 | | 1,033,415 | - |
| Understanding how physician cognitive biases affect the treatment of older adults with dementia and other vulnerable populations | 93.866 | 5F32AG060650-02 | | 73,070 | - |
| Use of prescription opioids following surgery and associated adverse patient outcomes in older adults | 93.866 | 1R56AG059620-01A1 REVISED | | 135,404 | - |
| Utilizing DNA Methylation Age to Understand The Effects of Fine Particles on Cognition | 93.866 | 5F31AG056124-02 | | 2,027 | - |
| Vascular mechanisms and tDCS treatment of gait and posture in aging and age related disease | 93.866 | 5K99AG051766-03 REVISED | | 72,155 | - |
| Welfare Effects of Balancing the Federal Social Security and Health Care Budgets | 93.866 | 5R01AG048037-05 | | 204,927 | 83,970 |
| **Total for CFDA 93.866** | | | | 19,798,880 | 4,487,525 |
| AAV Induced Toxicity in the Eye | 93.867 | 1R01EY029348-01A1 | | 327,435 | - |
| Characterizing and Remediating Recollection-Specific Face Recognition Deficits in Developmental Prosopagnosia | 93.867 | 1R21EY031000-01 | | 31,258 | - |
| Characterizing training-related neuroplasticity in developmental prosopagnosia | 93.867 | 5R01EY026057-04 | | 404,494 | - |
| Combinatorial roles of cadherins in retinal circuit assembly. | 93.867 | 5R01EY022073-09 REVISED | | 160,232 | - |
| CORE GRANT FOR VISION RESEARCH | 93.867 | 5P30EY012196-21 REVISED | | 791,634 | 137,398 |
| Cortico-Cortical Feedback | 93.867 | 5R01EY011379-22 | | 368,622 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Defining cell types of foveal and peripheral retina by high-throughput, single-cell transcriptional profiling | 93.867 | 5R21EY028633-02 | | 118,973 | 89,582 |
| Determinants of type-dependent retinal ganglion cell resilience: potential targets for neuroprotection and axon regeneration | 93.867 | 5K99EY029360-02 | | 91,984 | - |
| Determination of Cone Photoreceptor Fate | 93.867 | 5R01EY029771-02 REVISED | | 489,171 | - |
| Dissecting sensory and circadian circuitry that control the timing of sleep | 93.867 | 5F31EY027252-03 | | 4,054 | - |
| Elucidation of cellular reprogramming processes that drive lens regeneration in axolotl as a basis for future therapeutic approaches | 93.867 | 1K99EY029361-01A1 | | 102,602 | - |
| Investigation of the Mechanisms of Cone Degeneration in Retinitis Pigmentosa | 93.867 | 1K99EY030951-01 | | 47,579 | - |
| Mechanisms of Morphogen Secretion in Visual System Development and Disease | 93.867 | 5R01EY024093-05 REVISED | | 190,213 | - |
| Molecular control of neuronal shape and connectivity in the developing retina | 93.867 | 5R01EY024884-04 | | 139,642 | - |
| Research Training in Visual Neuroscience | 93.867 | 2T32EY007110-31 | | 69,682 | - |
| Research Training in Visual Neuroscience | 93.867 | 5T32EY007110-30 | | 8,757 | - |
| Reverse Correlation Mapping in Face Patches | 93.867 | 5R01EY016187-14 REVISED | | 357,417 | - |
| Structure and Interactions of Conformational Intermediates in gamma-D Crystallin Aggregation, and Their Targeting for Cataract Prevention | 93.867 | 1R01EY030444-01A1 | | 33,906 | - |
| The normal development of inferotemporal cortex | 93.867 | 5R01EY025670-04 | | 426,043 | - |
| **Total for CFDA 93.867** | | | | 4,163,698 | 226,980 |
| Boston-Area Research Training Program in Biomedical Informatics | 93.879 | 5T15LM007092-28 REVISED | | 960,184 | - |
| Bridges to Health Information for Individuals with Serious Mental Illness | 93.879 | (08) GLM012154B | | 12,199 | 10,291 |
| Statistical and Quantitative Training in Big Data Health Science | 93.879 | 5T32LM012411-04 | | 297,527 | - |
| **Total for CFDA 93.879** | | | | 1,269,910 | 10,291 |
| Academic Units for Primary Care Training and Enhancement | 93.884 | 6 UH1HP299620402 | | 705,520 | 185,270 |
| Primary Care Training and Enhancement Program | 93.884 | 5 T0BHP299970400 | | 443,152 | 242,818 |
| **Total for CFDA 93.884** | | | | 1,148,672 | 428,088 |
| Dietary Patterns and Risk of Cardiovascular Disease | 93.897 | 5R01HL060712-17 | | 806,410 | 482,331 |
| **Total for CFDA 93.897** | | | | 806,410 | 482,331 |
| Ryan White HRSA Dental Reimbursement Program | 93.924 | 1 T22HA336810100 | | 34,003 | - |
| **Total for CFDA 93.924** | | | | 34,003 | - |
| 2/2-Air Pollution and Health GeoHealth Hub Research and Capacity Building-US | 93.989 | 5U2RTW010108-05 | | 289,568 | - |
| Fogarty HIV Research Training Program for Low and Middle-Income Countries | 93.989 | 5D43TW009610-05REVISED | | (277) | - |
| Novel therapeutic agents from the bacterial symbionts of Brazilian invertebrates | 93.989 | 3U19TW009872-05S1 | | 285,559 | 98,480 |
| Partnership for Global Health Research Training Program | 93.989 | 5D43TW010543-03 | | 725,178 | 175,541 |
| Tanzania Infectious Disease Research Training Program | 93.989 | 5D43TW007886-10REV | | 198,634 | 58,044 |
| Telemedicine to improve the diagnosis of surgical site infections post-cesarean delivery in rural Rwanda | 93.989 | 3R21TW011229-02S1 REVISED | | 251,429 | 140,212 |
| Training in HIV/AIDS Prevention and Treatment Research in Botswana | 93.989 | 5D43TW009610-07 | | 269,175 | 105,000 |
| Training Tanzanian Researchers for HIV/AIDS Implementation Science | 93.989 | 5D43TW009775-05 | | 225,419 | 10,098 |
| **Total for CFDA 93.989** | | | | 2,244,685 | 587,375 |
| A Systems Approach to Measuring and Modeling Toxic Responses | 93.RD | HHSF223201400052C | | (33,533) | - |
| Center for Food Safety and Applied Nutrition (CFSAN) United States Population Longitudinal Data and Specialized Analytic Support | 93.RD | HHSF223201610080C | | 30,970 | - |
| Harvard School of Public Health (HSPH)/United States Population Longitudinal Data and Specialized Analytic Support: Research on energy drinks/other dietary intakes/health outcomes over time | 93.RD | 75F40119P10486 | | 79,053 | - |
| Human Organ Chips for Radiation Countermeasure Development | 93.RD | 75F40119C10098 | | 922,875 | 152,874 |
| Identifying Information Needs and communication Channels for researching at-risk populations during Emergencies | 93.RD | 75D30118C03566 | | 370,547 | 100,510 |
| Inter-professional Case-based Pain Medicine Curriculum for Students of Dentistry, Medicine, Pharmacy, Psychology, and Nursing in Boston, MA | 93.RD | HHSN271201500075C | | 51,068 | - |
| Long-term transgenerational health impacts of maternal obesity and gestational diabetes and their determinants | 93.RD | HHSN275201600003I | | (7,141) | - |
| Organ-on-Chips Tools for Testing of Radiation Countermeasures | 93.RD | HHSF223201310079C | | (2) | - |
| **Total for 93.RD** | | | | 1,413,837 | 253,384 |
| **Total for DHHS Direct Awards** | | | | 388,757,241 | 93,758,591 |
| **Agency for International Development** | | | | | |
| Advancing Economic Diversification in Ethiopia | 98.001 | 72066319CA00005 | | 979,886 | - |
| Raskin Welfare Reform: Transition to Electronic Distribution | 98.001 | 7200AA19FA00002 | | 292,848 | 22,991 |
| **Total for CFDA 98.001** | | | | 1,272,734 | 22,991 |
| **Total for Agency for International Development Direct Awards** | | | | 1,272,734 | 22,991 |
| **Reseach and Development Cluster Direct Awards Subtotal** | | | | 523,742,526 | 113,035,322 |
| **Reseach and Development Cluster (R & D)** | | | | | |
| **Subaward Received** | | | | | |
| **Department of Agriculture** | | | | | |
| CRDF Global - Randomised trial of an intervention to increase tuberculosis notifications by private practitioners in Indonesia, plus sequencing and susceptibility sub studies | 10.001 | | DAA3-19-64909-2 | 23,313 | - |
| **Total for CFDA 10.001** | | | | 23,313 | - |
| Trustees of Boston University - Fragmentation effects on forest productivity across managed ecosystem gradients | 10.310 | | 4500002411 | 62,153 | - |
| **Total for CFDA 10.310** | | | | 62,153 | - |
| Community Outreach and Patient Empowerment - Navajo Fruit and Vegetable Prescription Program | 10.331 | | AVA0417 | 7,964 | - |
| **Total for CFDA 10.331** | | | | 7,964 | - |
| **Total for Department of Agriculture Subaward Received** | | | | 93,430 | - |
| **Department of Commerce** | | | | | |
| Georgetown University - Formal Privacy Models and Title 13 | 11.016 | | AWD7772402-GR205353 | 397,471 | - |
| **Total for CFDA 11.016** | | | | 397,471 | - |
| **Total for Department of Commerce Subaward Received** | | | | 397,471 | - |
| **Department of Defense** | | | | | - |

**Harvard University**
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| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Columbia University - Imaging how a neuron computes | 12.300 | | 1 (GG008784) | 87,978 | - |
| Cornell University - Event-based Integrated Sensorimotor Planning and Control for Insect-scale Robots | 12.300 | | 80480-10878 | 98,947 | - |
| Drexel University - Learning to swim: principles for the neural control and coordination of multiple fins and segmented bodies for effective swimming and maneuvering | 12.300 | | 840026 | 129,495 | - |
| Drexel University - Neuromechanics of sensory-mediated gait control in fish swimming | 12.300 | | 204135-Harvard | (406) | - |
| Regents of the University of California - A Computational Cognitive Neuroscience Approach to Understanding Event Representation and Episodic Memory | 12.300 | | A17-0260-S004 | 222,447 | - |
| Regents of the University of California - Berkeley - Carbon-based Hierarchically Integrated Synthetic Electronics (CHISEL) | 12.300 | | 9294 | 105,080 | - |
| University of Maryland, College Park - SEA-STAR: Soft Echinoderm-Inspired Appendages for Strong Tactile Amphibious Robots | 12.300 | | 43637-Z8665002 | 162,082 | - |
| University of Virginia - EN-MAE Bio-Inspired Flexible Propulsors for Fast, Efficient Swimming: What Physics are we missing | 12.300 | | GG13311 146905 | 169,846 | - |
| University of Washington - High Dimensional Causal Model Search | 12.300 | | UWSC11180 | 101,419 | - |
| **Total for CFDA 12.300** | | | | 1,076,888 | - |
| Regents of the University of Michigan - Topobiological Targeting of the Blood Brain Barrier | 12.351 | | 3004717569 | 69,656 | - |
| **Total for CFDA 12.351** | | | | 69,656 | - |
| Brigham and Women's Hospital, Inc - Extremity regeneration of soft tissue lijury using growth factor impregnated gels | 12.420 | | 115662 | 163,157 | - |
| Dana-Farber Cancer Institute - Ultra-Sensitive Detection of Subclinical Lung Cancer by Statistical Analysis of Plasma-cfDNA-Derived Whole-Genome Sequencing Data | 12.420 | | 3084501 | 42,114 | - |
| Johns Hopkins School of Medicine - Developing a PTEN-ERG Signature to Improve Molecular Risk Stratification in Prostate Cancer | 12.420 | | 2003162452 | 2,529 | - |
| Johns Hopkins University - Defining IL-4-Activated Monocytes as Viable Cellular Immunotherapy in Acute Lung Injury | 12.420 | | 2003770543 | (2,011) | - |
| Memorial Sloan Kettering Cancer Center - SLCO2B1 and SLCO1B3 as new targets for enhancing androgen deprivation therapy for prostate cancer | 12.420 | | BD524801 | 48,864 | - |
| The Metis Foundation - A Platform for Burn Treatment and for Delayed Evacuation of Service Members | 12.420 | | S-W81XWH-16-1-0784-001 | 45 | - |
| **Total for CFDA 12.420** | | | | 254,698 | - |
| Board of Regents of the University of Wisconsin System - OPTION 1: Qubits in Gate-Defined Silicon Quantum Dots | 12.431 | | 752K205 | 282,936 | - |
| California Institute of Technology - Nonlinearity beats Damping: A New Class of Soft Active Metamaterials for Mechanical Logic, Signal Processing, and Autonomous Systems | 12.431 | | S384025 | 37,058 | - |
| Duke University - Evolutionary Mechanics of Impulsive Biological Systems: Guiding Scalable Synthetic Design | 12.431 | | 313-0588 | 266,658 | - |
| Massachusetts Institute of Technology - Ab-Initio Solid-State Quantum Materials: Design, Production, and Characterization at the Atomic Scale | 12.431 | | S4667 - PO 226099 | 238,841 | - |
| Massachusetts Institute of Technology - Efficient light-matter interfaces for Rydberg arrays and entanglement in topological quantum networks | 12.431 | | S4963 - PO 420751 | 8,058 | - |
| Massachusetts Institute of Technology - Managing Uncertainty: Principles for Robust and Dextrous Continuum Mechanics | 12.431 | | 5710003877 | (238) | - |
| Massachusetts Institute of Technology - Multi- Qubit Enhanced Sensing and Metrology | 12.431 | | 5710003135 | 316,398 | - |
| Regents of the University of California - Los Angeles - Dissecting microbiome-gut-brain circuits for microbial modulation of host cognition in response to diet and stress | 12.431 | | 0845 G XA622 | 81,279 | - |
| Regents of the University of California - San Diego - Dynamic Artificial Cells Composed of Synthetic Bioorthogonal Membranes | 12.431 | | 28401353 (MP invoice S9000469) | 50,084 | - |
| Regents of the University of California - Santa Barbara - Exotic Transport Properties and Unique Applications of Intercalated van der Waals Materials | 12.431 | | KK1913 | 120,364 | - |
| Regents of the University of Michigan - MultiScale Network Games of Collusion and Competition | 12.431 | | SUBK00012224 | 232,681 | - |
| Regents of the University of Minnesota - MURI: Multiscale Mathematical Modeling and Design Realization of Novel 2D Functional Materials | 12.431 | | A004135001 | 33,075 | - |
| Stanford University - Precision Measurements of Transverse Transport Coefficients by Torque Magnetometry | 12.431 | | 61651086-127442 | 100,699 | - |
| University of Chicago - Fundamental Issues in Non-equilibrium Dynamics (MURI) | 12.431 | | FP054294-B | 70,418 | - |
| University of Maryland, College Park - Center for Distributed Quantum Information | 12.431 | | 26234–Z8401003 | 411,464 | - |
| University of Missouri - Columbia - Quantum State Control of Molecular Collision Dynamics | 12.431 | | C00064278-1 | 156,012 | - |
| University of New South Wales Australia - OPTION 1: Donor-based Silicon Quantum Computing | 12.431 | | RG162743 | 87,415 | - |
| University of Pittsburgh - Adaptive Self-assembled Systems: Exploiting Multifunctionality for Bottom-up Large-scale Engineering (ASSEMBLE) | 12.431 | | CNVA0056411 (413469-1) | 583,245 | - |
| University of Rochester - Giant Nonlinear Response of ENZ Metastructures | 12.431 | | 417359 / URFAO: GR510802 | 244,232 | - |
| University of Southern California - Closed-Loop Multisensory Brain-Computer Interface for Enhanced Decision Accuracy | 12.431 | | 79575749 | 38,510 | - |
| Yale University - High-Resolution Quantum Control of Chemical Reactions | 12.431 | | C13J11491(CON-80000014) | (1,552) | - |
| **Total for CFDA 12.431** | | | | 3,357,637 | - |
| Henry M. Jackson Fndn for the Advancement of Military Med - Army Study to Assess Risk and Resilience in Service Members (STARRS 2) | 12.750 | | 2878 | 1,909,458 | 30,000 |
| Henry M. Jackson Fndn for the Advancement of Military Med - Army Study to Assess Risk and Resilience in Service Members (STARRS 2) | 12.750 | | 4908 | 586,220 | - |
| Henry M. Jackson Fndn for the Advancement of Military Med - Identifying Predictors of Treatment Response in Servicemembers with Post Traumatic Stress Disorder-Related Sleep Disturbances: Use of Large Datasets to Improve Treatment Selection over the Military Life | 12.750 | | 65476 | 90,330 | - |
| **Total for CFDA 12.750** | | | | 2,586,008 | 30,000 |
| Brown University - Information Methods for Uncertainty Quantification and Performance Guarantees in Predictive Modeling | 12.800 | | 1449 | 58,328 | - |
| Cornell University - Plant-mimetic functional materials for thermal management and suppression of freezing | 12.800 | | 87230-11088 | 39,479 | - |
| Massachusetts Institute of Technology - Foldable and Adaptive Two-Dimensional Electronics | 12.800 | | 5710003988 | 223,863 | - |
| Massachusetts Institute of Technology - Optimal Measurements for Scalable Quantum Technologies | 12.800 | | 5710003649 | (913) | - |
| University of Maryland, College Park - Photonic Quantum Matter | 12.800 | | 42692-Z8183002 | 407,158 | - |
| University of Texas - Austin - Ultralow power, Ultrafast, Integrated Nano-Optoelectronics | 12.800 | | UTA16-001252 | 197,022 | - |
| **Total for CFDA 12.800** | | | | 924,937 | - |
| Board of Regents of the University of Arizona - Global Reading and Assembly for Semantic, Probabilistic World Models (GRASP) | 12.910 | | 431715 | 236,214 | - |
| General Biologics - Patterned, Responsive Cellular Therapies Using Novel Mammalian Cellular Regulator Systems | 12.910 | | GenBio-00001 | 18,773 | - |
| International Business Machines Corporation - Harvard-IBM RFP for DARPA HR001117S0055 (DSSoC) | 12.910 | | CW2913640 | 811,650 | - |
| Massachusetts Institute of Technology - Many-body atomic clocks based on non-equilibrium correlated quantum matter | 12.910 | | S4759 - PO 303791 | 209,972 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Regents of the University of California - Berkeley - Driven Quantum Matter for Metrology (DQM2) | 12.910 | | 9965 | 497,760 | - |
| Regents of the University of California - San Diego - Non-equilibrium Order Parameter Optoelectronics for Quantum Information Processing | 12.910 | | 111684807 | 399,629 | - |
| Regents of the University of Michigan - A Mathematical Theory of Learning Guided by the Immune System | 12.910 | | SUBK00009294 | 44,790 | - |
| Regents of the University of Michigan - Robust AI Guided by the Immune System | 12.910 | | SUBK00011197 | 66,561 | - |
| Regents of the University of Michigan - Towards a Definition of Emergence | 12.910 | | 3004298846 | 3,962 | - |
| Stottler Henke Associates, Inc. - Pathogen Classification Tool | 12.910 | | 7872192-01 | 76,782 | - |
| University of Southern California - Graphical Encoding of First Principles for Agent-Based Social Simulation (GEFPABSS) | 12.910 | | 125372408 | 134,164 | - |
| **Total for CFDA 12.910** | | | | 2,500,257 | - |
| Charles River Analytics Inc. - Probabilistic Representation of Intent Commitments to Ensure Software Survival (PRINCESS) | 12.RD | | SC1512202 | 220,565 | - |
| Charles Stark Draper Laboratory, Inc. - Nano-Litz: Braided Nano-wires for High Performance RF Components | 12.RD | | SC001-0000000949 | 66,491 | - |
| Charles Stark Draper Laboratory, Inc. - Nano-Litz: Braided Nano-wires for High Performance RF Components | 12.RD | | SC001-0000000950 | 37,231 | - |
| Galois, Inc. - Merged Analysis To prevent Exploits (MATE) | 12.RD | | 2019-004 | 181,186 | - |
| HRL Laboratories, LLC - Hybrid Forecast Competition | 12.RD | | 16102-172910-QS | (84) | - |
| International Business Machines Corporation - Artificial Mental Models for Machine Common Sense | 12.RD | | CW3013552 | 112,150 | - |
| KeyW Corporation - Replication Markets | 12.RD | | 50003016 | 176,406 | - |
| Lincoln Laboratory - 3D Printing for Low-loss RF Components | 12.RD | | 7000445922 | 17,595 | - |
| Nano Terra - A Novel Strategy for Treating Peripheral Nerve Injury | 12.RD | | 20160229 | 26,632 | 26,632 |
| Radiation Monitoring Devices, Inc. - Atomic Layer Deposition of Highly Conductive Metals - Phase II | 12.RD | | C19-13 | 137,325 | - |
| Raytheon BBN Technologies Corp - INSPECT: IN Situ Phenotype Evaluation using CMOS Technology | 12.RD | | W911NF-19-C-0008 | 176,989 | - |
| Raytheon BBN Technologies Corp - Monolithic Integration of Lithium Niobate Photonics on GaN Electronics for THz for Communications and Signal Processing | 12.RD | | 90127 | 14,691 | - |
| Regents of the University of Michigan - ADA Jump | 12.RD | | 3004811120 | 550,599 | - |
| Southern Methodist University - Obtaining Multipath and Non-line-of-sight Information by Sensing Coherence and Intensity with Emerging Novel Techniques | 12.RD | | G001534-7510 | 27,052 | - |
| The Broad Institute - Molecular Encoding Technologies for Archiving | 12.RD | | 5012031-5500001336 | 251,514 | - |
| UES, Inc. - Predicting Fluid Rheology from Printing Process Parameters | 12.RD | | S-124-020-001 | 31,461 | - |
| University of Southern California - Realizing Cyber Inception: Towards a Science of Personalized Deception for Cyber Defense | 12.RD | | 123811799 | 235,258 | - |
| Aptima, Inc. - 2011 VALIDATE | 12.RD | | 1362-2011 | 55,049 | - |
| Charles Stark Draper Laboratory, Inc. - Draper Team Felix Proposal | 12.RD | | SC001-0000001214 | 238,895 | - |
| Charles Stark Draper Laboratory, Inc. - Thin-film lithium niobate (LN) Y-junction phase-modulator development | 12.RD | | SC001-0000001245 | 136,392 | - |
| Charles Stark Draper Laboratory, Inc. - SHRIMP is SHort-Range Independent Micro-robotic Platforms | 12.RD | | SC001-0000001267 | 164,958 | - |
| MITRE Corporation - Development of NV Diamond Integrated Circuit (IC) Imager | 12.RD | | 124787 | 451,069 | - |
| **Total for CFDA 12.RD** | | | | 3,309,424 | 26,632 |
| **Total for Department of Defense Subaward Received** | | | | 14,079,505 | 56,632 |
| **Department of Housing & Urban Development** | | | | | |
| The German Marshall Fund of the United States - Shared Housing: What can the United States learn from the Federal Republic of Germany's Shared Multigenerational Housing Model | 14.506 | | No Award Number | 18,466 | - |
| **Total for CFDA 14.506** | | | | 18,466 | - |
| George Washington University - The impact of housing assistance on residential environmental exposures | 14.906 | | 20-M01 | 4,853 | - |
| **Total for CFDA 14.906** | | | | 4,853 | - |
| **Total for Department of Housing & Urban Development Subaward Received** | | | | 23,319 | - |
| **Department of State** | | | | | |
| New America Foundation - A blockchain-based indexing system for factories | 19.345 | | SLMAQM18GR2203 | 85,149 | - |
| **Total for CFDA 19.345** | | | | 85,149 | - |
| **Total for Department of State Subaward Received** | | | | 85,149 | - |
| **NASA** | | | | | |
| California Institute of Technology - Collaborative Research: MAG Planning for the analysis of Proximal Orbit Data | 43.001 | | S407433 | 39,705 | - |
| Georgetown University - Agnostic Biosignatures for Extant Life | 43.001 | | AWD7773186-GR205803 | 98,267 | - |
| Jet Propulsion Laboratory - Measuring the fracture toughness and adhesion of metallization layers to thermoelectric substrates | 43.001 | | 1636472 | 107,467 | - |
| Ohio State University - Seeing in the dark: revealing dark matter microphysics with substructure lensing | 43.001 | | 60067579 | 13,533 | - |
| Planetary Science Institute - An Integrated Atmospheric and Subsurface Investigation of the Evolution of the Early Martian Hydrosphere: Implications for the Occurrence and Duration of Potentially Habitable Liquid Water Environmen | 43.001 | | 1599 | 64,616 | - |
| Regents of the University of California - Irvine - Quantifying and reducing uncertainty in future global and local sea-level estimates: linking physics, observations, and risk analysis to inform climate adaptation | 43.001 | | 2017-3520 | 41,562 | - |
| University of Chicago - Ocean and cryosphere dynamics and the habitable zone: through thick and thin ice | 43.001 | | FP062796-A | 30,303 | - |
| University of Colorado at Boulder - Airborne seasonal survey of CO2, CH4 and CO across the ABoVE Domain | 43.001 | | 1556305 | 77,523 | - |
| University of Southern California - Source-differentiated air quality system to safeguard the respiratory health of US military personnel deployed in Southwest Asia, Djibouti, and Afghanistan | 43.001 | | 117990936 | 103,089 | - |
| University of Texas - Austin - Evolution of Mercury's Core Dynamo | 43.001 | | UTA19-000492 | 11,259 | - |
| University of Washington - The Virtual Planetary Laboratory: Advancing the Search for Life Beyond the Solar System | 43.001 | | UWSC10439 | 32,076 | - |
| Washington University - Development of the High Performance Version of GEOS-Chem (GCHP) to enable broad community access to high-resolution atmospheric composition modeling and chemical data assimilation | 43.001 | | 80NSSC20K0281 | 19,995 | - |
| WGBH Educational Foundation - Bringing the Universe to America's Classroom | 43.001 | | K190080 | 66,435 | - |
| WGBH Educational Foundation - Bringing the Universe to America's Classroom | 43.001 | | K201800924 | (2) | - |
| Woods Hole Oceanographic Institution - Exploring Ocean Worlds: Ocean System Science to Support the Search for Life | 43.001 | | 23142700 | 8,671 | - |
| **Total for CFDA 43.001** | | | | 714,499 | - |
| Baylor College of Medicine - Omics in space (OIS): Technology Development for Omics Instrumentations and Biomarker Measurements | 43.003 | | T0101 | (8,020) | - |
| **Total for CFDA 43.003** | | | | (8,020) | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Arizona State University - High dimensional biology to understand the functional response of Salmonella to long-term multigenerational growth in the chronic stress of microgravity | 43.007 | | 17-034 | 3 | - |
| **Total for CFDA 43.007** | | | | 3 | - |
| Purdue University - Resilient ExtraTerrestrial Habitats institute (RETHi) | 43.012 | | 12000295-027 | 196,464 | - |
| **Total for CFDA 43.012** | | | | 196,464 | - |
| Atmospheric and Environmental Research, Inc - Prototype regional carbon monitoring systems for urban regions | 43.RD | | P2088-003 | 10,286 | - |
| Board of Regents of the University of Arizona - JWST Near Infrared Camera (NIRCam) | 43.RD | | 152977 | 166,697 | - |
| California Institute of Technology - Impacts of Droughts on Carbon Stocks and Fluxes of Amazonian Forest Ecosystems | 43.RD | | 1598815 | 84,860 | - |
| Massachusetts Institute of Technology - REXIS for OSIRIS-Rex Mission Phase E | 43.RD | | 5923-007 | 546,237 | - |
| Smithsonian Astrophysical Observatory - Participation in the Transiting Exoplanet Survey Satellite (TESS) Mission | 43.RD | | SV9-89017 | 160,670 | - |
| Smithsonian Astrophysical Observatory - Participation in the Transiting Exoplanet Survey Satellite (TESS) Mission | 43.RD | | SV9-89018 | 86,886 | - |
| Southwest Research Institute - Juno Project | 43.RD | | 699042X | 428,538 | - |
| **Total for 43.RD** | | | | 1,484,174 | - |
| **Total for NASA Subaward Received** | | | | 2,387,120 | - |
| **Institute of Museum and Library Services** | | | | | |
| Simmons University - Retooling the Librarian Workforce: Innovative Post-Master's Certificate Program for Developing Inter-Professional Informationalists (IPI) | 45.313 | | S400019HMS | 39,177 | - |
| **Total for CFDA 45.313** | | | | 39,177 | - |
| **Total for Institute of Museum and Library Services Subaward Received** | | | | 39,177 | - |
| **National Science Foundation** | | | | | |
| Massachusetts Institute of Technology - DMREF: Computational Design of Next-generation Nanoscale DNA-based Materials | 47.041 | | 74850 | 60,711 | - |
| Massachusetts Institute of Technology - EFRI ACQUIRE: Scalable Quantum Networks with Error-Corrected Semiconductor Qubits | 47.041 | | 5710004174 | 75,266 | - |
| Massachusetts Institute of Technology - EFRI C3 SoRo: Soft, Strong, and Safe Configurable Robots for Diverse Manipulation Tasks | 47.041 | | S4649 - PO 217699 | 253,615 | - |
| Stanford University - RAISE TAQS: Engineering high quality, practical qubits in diamond | 47.041 | | 62035117-137164 | 163,884 | - |
| Michigan State University - ISN2 Detecting and Interdicting Illicit Wildlife Trafficking Supply Chains | 47.041 | | RC110481HU | 7,665 | - |
| Trustees of Boston University - Nanosystems Engineering Research Center for Directed Multiscale Assembly of Cellular Metamaterials with Nanoscale Precision: CELL-MET | 47.041 | | 4500003223 | 131,064 | - |
| Perceptive Automata, Inc. - Phase II: Human Agent prediction for autonomous vehicles | 47.041 | | No Award Number | 29,405 | - |
| Trustees of Boston University - Nanosystems Engineering Research Center for Directed Multiscale Assembly of Cellular Metamaterials with Nanoscale Precision: CELL-MET | 47.041 | | 4500003224 | 85,152 | - |
| University of Illinois at Urbana - Champaign - EFRI C3 SoRo: An integrated approach towards the computational design, fabrication and understanding of bio-hybrid soft architectures capable of adaptive behavior | 47.041 | | 093088-17158 | 37,693 | - |
| **Total for CFDA 47.041** | | | | 844,455 | - |
| Association of Universities for Research in Astronomy, Inc. - LSST Atmospheric Calibration | 47.049 | | N67177C-L | 16,155 | - |
| California Institute of Technology - Powering the Planet: A CCI Center for the Direct Conversion of Sunlight into Chemical Fuel | 47.049 | | 68D-1094592 | 87 | - |
| Columbia University - Columbia MRSEC | 47.049 | | 2(GG008600-13) | 27,870 | - |
| Massachusetts Institute of Technology - Characterizing and Utilizing 2D van der Wals Materials with Superconducting Qubits | 47.049 | | S4874 - PO 382989 | 117,553 | - |
| Massachusetts Institute of Technology - NSF PFC Center for Ultracold Atoms Renewal | 47.049 | | S4528 - PO 128237 | 1,038,125 | - |
| National Radio Astronomy Observatory - NRAO Student Observing Support Award to Tarraneh Eftekhari | 47.049 | | SOSA6-008 | 17,866 | - |
| National Radio Astronomy Observatory - NRAO Student Observing Support Award to Tarraneh Eftekhari | 47.049 | | SOSPA7-002 | 7,191 | - |
| Navajo Technical University - VENTURES - Vision for Excellence at Navajo Technical University in Research and Education in STEM | 47.049 | | 42766-00-1174 | 28,528 | - |
| Northwestern University - ACME - Advanced Cold Molecule Electron Electric Dipole Moment Search | 47.049 | | 60050198 HC | 127,104 | - |
| Northwestern University - Surfaces of Secondary Organic Aerosol Particles | 47.049 | | SP0036066-PROJ0009763 | 98,640 | - |
| Purdue University - RAISE-TAQS: Multifunctional Hybrid Quantum Systems for Spin-Based Quantum Control and Metrology | 47.049 | | 10001431-011 | 117,110 | - |
| Stanford University - MSIP: Innovation to Achieve the Full Science Reach of the BICEP Array Stage 3 CMB Polarization Experiment | 47.049 | | 61941274-134448 | 244,425 | - |
| Yale University - ACME III: Advanced Cold Molecule Electron Electric Dipole Moment Search | 47.049 | | GR107173(CON-80001858) | 191,760 | - |
| Yale University - ACME: Advanced Cold Molecule Electron Electric Dipole Moment Search | 47.049 | | C15D11959(CON-80000041) | (218) | - |
| **Total for CFDA 47.049** | | | | 2,032,196 | - |
| California Institute of Technology - MRI: Development of a 150 GHz Receiver for the BICEP Array CMB Polarimeter | 47.050 | | S386502 | 56,866 | - |
| Massachusetts Institute of Technology - INSPIRE: Search for Records of the Hadean Dynamo in Detrital Zircons | 47.050 | | 5710004192 | (2,022) | - |
| Southern California Earthquake Center - SCEC5 NSF Research Collaboration at Harvard University | 47.050 | | 118062181 | 92,768 | - |
| University of Massachusetts - Lowell - Collaborative Project: Magnitude and pathways of gaseous atmospheric mercury deposition in forests | 47.050 | | S52100000041358 | 15,066 | - |
| **Total for CFDA 47.050** | | | | 162,678 | - |
| Massachusetts Institute of Technology - A Center for Brains, Minds, and Machines: The Science and the Technology of Intelligence | 47.070 | | 5710003525 | 697,743 | 172,137 |
| Trustees of Boston University - CIF21 DIBBs: EI: North East Storage Exchange, | 47.070 | | 4500002550 | 227,342 | - |
| University of Delaware - NRI: INT: COLLAB: Anthropomorphic Robotic Ankle Prosthesis with Programmable Materials | 47.070 | | 57023 | 3,448 | - |
| University of Illinois at Urbana - Champaign - Sustained-Petascale in Action: Blue Waters Enabling Transformative Science and Engineering | 47.070 | | 067846-17489 | 26,209 | - |
| University of Southern California - NeTS: Large: Collaborative Research: Programmable Inter-Domain Observation and Control | 47.070 | | 101504188 | 206,364 | - |
| Yale University - NeTS: Small: A Virtualized Network Resource Pool for Software-Defined Network Management | 47.070 | | GR10481(CON-80001472) | 8,031 | - |
| **Total for CFDA 47.070** | | | | 1,169,137 | 172,137 |
| Northern Arizona University - Collaborative Proposal: MSB-FRA: Improved Understanding of Feedbacks between Ecosystem Phenology and the Weather-Climate Nexus at Local-to-Continental Scales | 47.074 | | 1003392-01 | 12,456 | - |
| Northern Arizona University - Collaborative Proposal: NSFDEB-NERC: Addressing the plant growth source-sink debate through observations, experiment, and modeling. | 47.074 | | 1003391-01 | 12,722 | - |
| Regents of the University of California - Davis - VISABLI, an RCN-UBE for Visualizations, Interactive Simulations, and Animations for Biology Learning and Instruction | 47.074 | | A19-0888-S001-A01 | 39,745 | - |
| Regents of the University of California - Santa Barbara - IDBR TYPE A: Definitive Chemical Analysis of Microbial Volatile Mixtures via Microwave Spectroscopy | 47.074 | | KK1874 | 52,827 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Texas A and M University - Digitization TCN: Collaborative: American Crossroads: Digitizing the vascular flora of the south-central United States | 47.074 | | M1903686 | 77,408 | - |
| Yale University - Analysis of transient nuclear ruptures during development | 47.074 | | GR105087(CON-80001599) | 76,257 | - |
| **Total for 47.074** | | | | 271,415 | - |
| Northeastern University - CRISP Type 2: Interdependent Network-based Quantification of Infrastructure Resilience (INQUIRE) | 47.075 | | 502536-78051 | 70,022 | - |
| Regents of the University of California - Irvine - Multidimensionality of Race and Social Networks | 47.075 | | 2019-3781 | 21,674 | - |
| Tufts University - 2020 Cooperative Congressional Election Study | 47.075 | | SF0085 | 7,984 | - |
| University of Maryland, College Park - Economic Mobility: The Impact of Individual, Parent and Spatial Factors using National Survey Data | 47.075 | | 53730-Z3111201 | 50,763 | - |
| **Total for CFDA 47.075** | | | | 150,443 | - |
| Carnegie Mellon University - Collaborative Research: Using Educational Data Mining Techniques to Uncover How and Why Students Learn from Erroneous Examples | 47.076 | | 1122530-383320 | 36,912 | - |
| **Total for CFDA 47.076** | | | | 36,912 | - |
| Board of Regents of the University of Arizona - PIRE: Black-Hole Astrophysics in the Era of Distributed Resources and Expertise | 47.079 | | 438295 | 126,569 | - |
| CRDF Global - JIAS Modeling Guide to Practice - Harvard | 47.079 | | OISE-17-62965-1 | 10,000 | - |
| University of Chicago - PIRE: International Partnership for Cirrus Studies | 47.079 | | FP065300-A | 107,725 | - |
| **Total for CFDA 47.079** | | | | 244,294 | - |
| Smithsonian Astrophysical Observatory - The Event Horizon Telescope Experiment (MSIP) | 47.RD | | SV5-85010 | 162,466 | - |
| Smithsonian Astrophysical Observatory - The Spectrum Laboratory: Toward Authentic Inquiry for All | 47.RD | | SV8-88015 | 57,587 | - |
| **Total for 47.RD** | | | | 220,053 | - |
| **Total for National Science Foundation Subaward Received** | | | | 5,131,583 | 172,137 |
| **EPA** | | | | | |
| Health Effects Institute - Assessing Adverse Health Effects of Long-Term Exposure to Low Levels of Ambient Air Pollution | 66.511 | | 4953-RFA14-3/16-4-4 | 488,069 | 23,190 |
| **Total for CFDA 66.511** | | | | 488,069 | 23,190 |
| **Total for EPA Subaward Received** | | | | 488,069 | 23,190 |
| **Department of Energy** | | | | | |
| California Institute of Technology - Quantum Communication Channels for Fundamental Physics (QCCFP) | 81.049 | | S400020 | 211,151 | - |
| National Renewable Energy Laboratory - Center for Next Generation of Materials by Design: Incorporating Metastability | 81.049 | | ZGJ-4-42246-01 | 127 | - |
| Northwestern University - Center for Bio-Inspired Energy Science (CBES) | 81.049 | | SP0027267-PROJ0007134 | 223,110 | - |
| Northwestern University - Center for Bio-Inspired Energy Science | 81.049 | | 60038340 | 57,451 | - |
| Regents of the University of California - Los Angeles - Molecules Functionalized with Cycling Centers for Quantum Information Science | 81.049 | | 1000 G WB867 | 51,152 | - |
| Stanford University - Controlled synthesis of solid-state quantum emitter arrays for quantum computing and simulation | 81.049 | | 62267247-151086 | 126,503 | - |
| Stanford University - Photonics at Thermodynamic Limits | 81.049 | | 61961562-136555 | 300,174 | - |
| University of Texas - Arlington - QPix Technology: Quantifying the physics potential of a kiloTon scale pixelated LArTPC | 81.049 | | 12608015662 | 33,028 | - |
| **Total for CFDA 81.049** | | | | 1,002,696 | - |
| Clemson University - All-Digital Plug and Play Passive RFID Sensors for Energy Efficient Building Control | 81.086 | | 1883-219-2021621 | 22,576 | - |
| **Total for CFDA 81.086** | | | | 22,576 | - |
| California Institute of Technology - Real-time optimization and control of next-generation | 81.135 | | S437235 | 10,568 | - |
| United Technologies Research Center - Synergistic Membranes and Reactants for Transformational Flow-Battery System | 81.135 | | 1231122 | 104,365 | - |
| **Total for CFDA 81.135** | | | | 114,933 | - |
| Argonne National Laboratory - Connecting Optical Models to Measurements | 81.RD | | 0F-60073 | 57,466 | - |
| Brookhaven National Laboratory - ATLAS ITk Upgrade Strip Stave Assembly | 81.RD | | 336319 | 23,417 | - |
| Brookhaven National Laboratory - ATLAS Phase II Upgrade: ITk Strip Stave Assembly | 81.RD | | 340452 | 46,313 | - |
| Brookhaven National Laboratory - WBS 1.2.4.1 Trigger Processor Integration and Commissioning | 81.RD | | 358424 | 125,790 | - |
| Iowa State University - EFRC: Center for the Advancement of Topological Semimetals | 81.RD | | SC-19-488 | 408,110 | - |
| Lawrence Berkeley National Lab - Operation of the Harvard Forest Core Site in the AmeriFlux Network Management Project (ANMP) | 81.RD | | 7086573 | 216,025 | - |
| Lawrence Livermore Laboratory - Computational Design of Broadly Neutralizing Vaccines for Highly Mutable Pathogens | 81.RD | | B620984 | 37,283 | - |
| Oak Ridge National Laboratory - Development and Testing Quantum Algorithms Using Programmable Quantum Simulators | 81.RD | | 4000171155 | 76,308 | - |
| Oak Ridge National Laboratory - Understanding and Controlling Entangled and Correlated Quantum States in Confined Solid-state Systems Created via Atomic Scale Manipulation | 81.RD | | 4000169326 | 137,405 | - |
| Pacific Northwest National Laboratory - AQUEOUS SOLUBLE ORGANIC MOLECULE AND ELECTRODE DEVELOPMENT | 81.RD | | 428977 | 232,756 | - |
| Pacific Northwest National Laboratory - SODALITE (DARPA RTML) collaboration | 81.RD | | 488872 Modification 1 | 9,172 | - |
| **Total for 81.RD** | | | | 1,370,045 | - |
| **Total for Department of Energy Subaward Received** | | | | 2,510,250 | - |
| **Department of Education** | | | | | |
| Ascend Learning Inc - Rigorous Evaluation of the Ascend Learning Model | 84.282M | | No Award Number | 57,399 | - |
| **Total for CFDA 84.282M** | | | | 57,399 | - |
| Manpower Demonstration Research Corporation - Supporting Early Learning from Preschool Through Elementary School Grades: Research Network Proposal | 84.305 | | No Award Number | 280,755 | - |
| **Total for CFDA 84.305** | | | | 280,755 | - |
| American Institutes for Research - Building and Sustaining the Capacity of Local Math Coaches to Support College- and Career-Ready Mathematics Instruction | 84.305A | | 482000001 | 100,433 | - |
| Florida State University - Efficacy of the Core Knowledge Language Arts Listening and Learning Read Aloud Program in Kindergarten through Second Grade Classrooms | 84.305A | | R01972 | 18,866 | - |
| Northwestern University - Contexts Inside and Outside of School Walls as Predictors of Differential Effectiveness in Preschool Professional Development | 84.305A | | SP0034839-PROJ0009316 | 14,955 | - |
| **Total for CFDA 84.305A** | | | | 134,254 | - |
| Tennessee Department of Education - Setting Students Up for Success | 84.372A | | 33145-01417 | 59,066 | - |
| Tennessee Department of Education - Setting Students Up for Success: Research, Evaluation, and Guidance on College Going Interventio | 84.372A | | 33145-02720 | 52,415 | - |
| **Total for CFDA 84.372A** | | | | 111,481 | - |

**Harvard University**
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| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| University of Colorado at Boulder - Center for the Study of Interactive Knowledge Utilization | 84.RD | | 1551538 | (1) | - |
| **Total for CFDA 84.RD** | | | | (1) | - |
| **Total for Department of Education Subaward Received** | | | | 583,888 | - |
| **DHHS** | | | | | |
| Jos University Teaching Hospital - Reaching 90 percent target of HIV viral suppression: The role of point of care VL monitoring in resources constrained settings | 93.067 | | SPH | 190,640 | - |
| **Total for CFDA 93.067** | | | | 190,640 | - |
| Silent Spring Institute - Assessment of PFAS exposures and health effects in two Massachusetts communities with PFAS drinking water contamination | 93.070 | | 7101-HSPH-Y1 | 11,181 | - |
| **Total for CFDA 93.070** | | | | 11,181 | - |
| Stanford University - Prevention Policy Modeling Lab | 93.084 | | 62380390-148206 | 75,010 | - |
| University of Utah - Modeling and Simulation to Support Antibiotic Stewardship and Epidemiological Decision-Making in Healthcare Settings | 93.084 | | 10044546-01 | 271,035 | - |
| **Total for CFDA 93.084** | | | | 346,045 | - |
| Medical Device Innovation Consortium - NESTcc Methods Subcommittee Support | 93.103 | | 6292-2018-M-001 | 3,502 | - |
| Weill Medical College of Cornell University - Creating National Surveillance Infrastructure for Priority Medical Devices | 93.103 | | 184021 | 15,776 | - |
| **Total for CFDA 93.103** | | | | 19,278 | - |
| Brown University - Evidence to improve heat warning effectiveness in reducing morbidity and mortality | 93.112 | | 1335 | 104,197 | - |
| **Total for CFDA 93.112** | | | | 104,197 | - |
| Beth Israel Deaconess Medical Center - Maternal organophosphate pesticide exposure, low birth weight and placental injury | 93.113 | | 1060906 | 53,548 | - |
| Board of Trustees of the University of Illinois - Phthalate and Hot Flashes in Women | 93.113 | | 086885-16438 | 68,300 | - |
| Boston University School of Public Health - Development and testing of response surface methods for investigating the epidemiology of exposure to mixtures | 93.113 | | 4500002635 | 220,808 | - |
| Boston University School of Public Health - Endocrine Disrupting Chemicals and Risk of Uterine Fibroids: A Prospective Study | 93.113 | | 4500001944 | 23,437 | - |
| Boston University School of Public Health - Validation of Portable XRF for Invivo Measurement of Heavy Metal Exposures | 93.113 | | 4500002203 | 473 | - |
| Brigham and Women's Hospital, Inc - The effects of environmental exposures on semen quality and the sperm epigenome | 93.113 | | 118582 | 256,057 | - |
| Children's Hospital Boston - Arsenic related cystic fibrosis (administrative supplement) | 93.113 | | GENFD0001723790 | 8,239 | - |
| Children's Hospital Boston - Arsenic-related cystic fibrosis. | 93.113 | | GENFD0001644590 | 14,715 | - |
| Children's Hospital Boston - Does Arsenic Increase Risk of Neural Tube Defect in a Highly-exposed Population | 93.113 | | GENFD0001650679 | 19,080 | - |
| Children's Hospital Boston - Indoor Air Quality and Respiratory Morbidity in School-Aged Children with Bronchopulmonary Dysplasia | 93.113 | | GENFD0001780031 | 98,578 | - |
| Columbia University - Air Pollution Exposure and Risk of Amyotrophic Lateral Sclerosis (ALS) | 93.113 | | 1(GG013011-01) | 21,233 | - |
| Columbia University - Circulating microRNAs in Extracellular Vesicles, Air Particulate Pollution, and Lung Function in an Aging Cohort | 93.113 | | 1(GG010691-01) | 62,708 | - |
| Columbia University - Effect of Early-Life Exposure to Metal Mixtures on Lung Function and Mitochondrial DNA in Children | 93.113 | | 3(GG015212-01) | 5,897 | - |
| Columbia University - Integrating air pollution prediction models: Uncertainty quantification and propagation in health studies | 93.113 | | 1(GG014961-01) | 35,896 | - |
| Columbia University - The Impact of Unconventional Natural Gas Development on Maternal, Perinatal, and Childhood Health: an Electronic Health Record Approach | 93.113 | | 2(GG014926-01) | 12,440 | - |
| Harvard Pilgrim Health Care, Inc - Longitudinal Associations of PFCs with Obesity Diabetes, and Metabolic Syndrome | 93.113 | | PH000552E | 68,388 | - |
| Icahn School of Medicine at Mount Sinai - Developmental exposure to perfluoroalkyl substances and cardiometabolic outcomes in adulthood: Potential links via the plasma metabolome | 93.113 | | 0255-C831-4609 | 11,564 | - |
| Icahn School of Medicine at Mount Sinai - Methods for data integration and risk assessment for environmental mixtures | 93.113 | | 0255-A401-4609 | 120,157 | - |
| Icahn School of Medicine at Mount Sinai - Neurologic Function in Children Exposed to Ambient Manganese | 93.113 | | 0255-0182-4609 | 23,585 | - |
| Icahn School of Medicine at Mount Sinai - Prenatal metal mixtures and neurodevelopment: Role of placental extracellular microRNAs | 93.113 | | 0255-B981-4609 | 108,626 | - |
| Icahn School of Medicine at Mount Sinai - Stress-Chemical Interactions and Neurobehavior in School Age Children | 93.113 | | 0255-5545-4609 | 48,785 | - |
| Mount Sinai Medical Center - Novel Biomarker to Identify Critical Windows of Susceptibility to Metal Mixtures: Resubmission | 93.113 | | 0255-1871-4609 | 23,585 | - |
| University of Massachusetts - Amherst - Paternal preconception phthalates and reproductive health - potential mediation through sperm DNA methylation | 93.113 | | 19-010627-A01 | 103,695 | - |
| University of Texas - Causal Inference with Interference for Evaluating Air Quality Policies | 93.113 | | UTA19-000141 | 59,599 | - |
| Washington State University - The UGT2A and 3A Metabolizing Enzymes and Tobacco-Related Cancer Risk | 93.113 | | 124336G003759 | 58,592 | - |
| Yale University - Comprehensive Translational Science Analytics Tools for the Global Health Agenda | 93.113 | | GR105382 (CON-80001652) | 44,162 | - |
| Yale University - Statistical Methods to Account for Exposure Uncertainty in Environmental Epidemiology | 93.113 | | GR104702 (CON-80001508) | 264,164 | - |
| **Total for CFDA 93.113** | | | | 1,836,311 | - |
| Boston University School of Public Health - Validation of Portable XRF for Invivo Measurement of Heavy Metal Exposures | 93.114 | | 4500002875 | 2,231 | - |
| **Total for CFDA 93.114** | | | | 2,231 | - |
| Kaiser Foundation Research Institute - Particulate Air Pollution, Cardiovascular Events, and Susceptibility Factors (PACES) | 93.117 | | RNG209805-HSPH-01 | 41,563 | - |
| **Total for CFDA 93.117** | | | | 41,563 | - |
| Physical Sciences Inc. - Optical Probe for real-time assessment of periodontal health status | 93.121 | | SC 82527-1976-46 | 28,105 | - |
| Regents of the University of Michigan - Michigan-Pittsburgh-Wyss Resource Center: Supporting Regenerative Medicine in Dental Oral and Craniofacial Technologies | 93.121 | | 3004400289 | 116,543 | - |
| The Forsyth Institute - Bayesian multivariate image analysis for studying oral microbiome biogeography | 93.121 | | HSPH026872-2625 | 21,547 | - |
| The Forsyth Institute - Regulartory B cells in periodontal disease | 93.121 | | HSDM025255-2550 | 50,986 | - |
| University of South Florida - The Oral Microbiome in Type 1 Diabetes and Sub-Clinical Cardiovascular Disease | 93.121 | | 6403-1081-00-A | 54,199 | - |
| University of Texas Health Science Center at Houston - Implementing Dental Quality Measures in Practice | 93.121 | | 0010816A | 17,294 | - |
| **Total for CFDA 93.121** | | | | 288,674 | - |
| Massachusetts General Hospital - Clinic and Community Approaches to Healthy Weight | 93.136 | | 229250 | 11,144 | - |
| **Total for CFDA 93.136** | | | | 11,144 | - |
| Indiana University - NIEHS Worker Trainer Grant | 93.142 | | BL-4645510-HARV | 12,719 | - |
| **Total for CFDA 93.142** | | | | 12,719 | - |
| University of Rhode Island - Impacts of geochemistry and transport on PFAS exposures from drinking water and fish | 93.143 | | 0006745-11317 | 290,621 | 49,131 |
| University of Rhode Island - Sources, Transport, Exposure and Effects of Perfluoroalkyl Substances (STEEP) Center | 93.143 | | 0006660-11117 | 17,398 | - |
| University of Rhode Island - Sources, Transport, Exposure and Effects of Perfluoroalkyl Substances (STEEP) Center | 93.143 | | 0006746-11217 | 150,740 | 82,983 |

**Harvard University**
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| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| **Total for CFDA 93.143** | | | | 458,759 | 132,114 |
| University of Miami - Environmental Risk Factors and Gene-Environment Interactions in ALS Risk and Progression | 93.161 | | SPC-000701 | (188) | - |
| **Total for CFDA 93.161** | | | | (188) | - |
| Brigham and Women's Hospital, Inc - Integrated pathogenicity assessment of clinically actionable genetic variants | 93.172 | | 120308 | 147,969 | - |
| California Institute of Technology - Alliance Central: A platform for sustainable development of next generation genome knowledgebases | 93.172 | | S454486 | 522,378 | - |
| California Institute of Technology - The Alliance of Genomic Resources: towards integration of six model organism databases and the Gene Ontology Consortium | 93.172 | | S405063 | 3,546 | - |
| Dana-Farber Cancer Institute - Overcoming Bias and Unwanted Variability in Next Generation Sequencing | 93.172 | | 1228008 | (3,248) | - |
| Johns Hopkins University - Direct nanopore detection of modified RNA to probe structure and dynamics | 93.172 | | R01HG010538 | 384,564 | - |
| Lawrence Berkeley National Lab - Systematic, Genome-Scale Functional Characterization of Conserved smORFs | 93.172 | | 7374618 | 124,994 | - |
| Ontario Institute for Cancer Research - Scaling up structured biological pathway knowledge acquisition at Reactome using text mining and crowdsourcing | 93.172 | | P2019-0015 | 234,807 | - |
| Regents of the University of California - Los Angeles - Integrative approaches for mapping the genetic risk of complex traits | 93.172 | | 1625GUE724 | 98,123 | - |
| The Broad Institute - A Catalog of Cell Types and Genomic Elements in Tissues, Organoids and Disease | 93.172 | | 5000313-5500000958 | 108,353 | - |
| The Broad Institute - In situ ATAC-seq, a novel technology for structural epigenomics | 93.172 | | 5000880-5500001243 | (10,700) | - |
| **Total for CFDA 93.172** | | | | 1,610,786 | - |
| Brandeis University - Towards molecular mechanisms of invertebrate Gustatory Receptors | 93.173 | | GR403926 | 7,108 | - |
| Massachusetts Eye and Ear Infirmary - Cochlear Synaptopathy: Prevalence, Diagnosis and Functional Consequences | 93.173 | | 2300175 | 78,008 | - |
| Massachusetts General Hospital - Enhanced gene delivery for CNS and Sensory Disorders | 93.173 | | 234217 | 48,216 | - |
| San Diego State University Research Foundation - The Association of Perinatal HIV Infection and Hearing Loss in Children of Cape Town, South Africa | 93.173 | | SA0000594 | 41,197 | - |
| **Total for CFDA 93.173** | | | | 174,529 | - |
| COVID-19 - Carnegie Mellon University - Delphi Influenza Forecasting Center of Excellence | 93.185 | | 1090610-425284 | 20,729 | - |
| **Total for CFDA 93.185** | | | | 20,729 | - |
| Beth Israel Deaconess Medical Center - Coupling technology and mind-body exercise to facilitate physical activity in chronic cardiopulmonary disease | 93.213 | | 1029585 | 3,984 | - |
| Beth Israel Deaconess Medical Center - Tai Chi after Pulmonary Rehabilitation in Patients with COPD: A Randomized Trial | 93.213 | | 1029129 | 2,198 | - |
| Brigham and Women's Hospital, Inc - Contribution of phytochemicals to gut symbiont colonization and synthesis of immunomodulatory sphingolipids | 93.213 | | 120907 | 79,063 | - |
| Emory University - Mechanistic studies on analgesic effects of terpene enriched extracts from hops | 93.213 | | A250025 | 67,600 | - |
| **Total for CFDA 93.213** | | | | 152,845 | - |
| Brigham and Women's Hospital, Inc - Identifying Cascades of Low-Value Care and the Organizational Practices that Prevent them | 93.226 | | 117961 | 19,110 | - |
| Children's Hospital Boston - Improving Child Health and Healthcare through Dissemination and Implementation of Pediatric Quality Measures | 93.226 | | GENFD0001728451 | 18,249 | - |
| Harvard Pilgrim Health Care, Inc - Decision Making Challenges and Needs for Health Insurance Exchange Enrollees | 93.226 | | No Award Number | 109,530 | - |
| Massachusetts General Hospital - Federally Qualified Health Centers and Care for Vulnerable Polpulations | 93.226 | | 231035 | 12,609 | - |
| Massachusetts General Hospital - Medicaid Payment Policy and Access to Care for Dual-Eligible Beneficiaries | 93.226 | | 229188 | 48,370 | - |
| National Bureau of Economic Research - Measuring the Clinical and Economic Outcomes Associated with Delivery Systems | 93.226 | | 41610.01.13.00-HMS | 917,660 | - |
| National Bureau of Economic Research - The Impact of Direct-to-Consumer, Video Telehealth | 93.226 | | 41740 | 58,305 | - |
| Rand Corporation - Understanding the role of physician group organizational capabilities and integration in PCOR implementation and outcomes | 93.226 | | 9920190031 | 29,698 | - |
| Regents of the University of Minnesota - Medical reversals: De-implementing ineffective and unsafe treatments | 93.226 | | P006920953 | 18,925 | - |
| Trustees of Dartmouth College - Accelerating the Use of Evidence-based Innovations in Healthcare Systems | 93.226 | | R817 | 238,529 | - |
| University of Chicago - Effects of Ambulance, Transport Distance, and Hospital Destination on Health Outcomes of Out of Hospital Medical Emergencies | 93.226 | | FP066242 | 132,020 | - |
| Yale University - Consumer Assessment of Healthcare Providers and Systems (CAHPS V) | 93.226 | | GR107654 (CON-80001942) | 95,361 | - |
| **Total for CFDA 93.226** | | | | 1,698,366 | - |
| Beth Israel Deaconess Medical Center - Mechanisms of Arousal in Sleep Apnea | 93.233 | | 1061584 | 226,755 | - |
| **Total for CFDA 93.233** | | | | 226,755 | - |
| Allen Institute for Brain Science - A comprehensive whole-brain atlas of cell types in the mouse | 93.242 | | 2017-0570 | 634,028 | - |
| Beth Israel Deaconess Medical Center - 3/9 Predictors and Mechanisms of Conversion to Psychosis | 93.242 | | 1061037 | 7,322 | - |
| Beth Israel Deaconess Medical Center - A Psychobiological Follow-up Study of Transition from Prodrome to Early Psychosis | 93.242 | | 1029400 | 47,455 | - |
| Board of Trustees of the University of Alabama-Birmingham - PrEP uptake/adherence to reduce periconception HIV risk for South African women | 93.242 | | 000523846-003 | 7,773 | - |
| Brigham and Women's Hospital, Inc - In-utero exposure to psychotropic medications and the risk of neurodevelopmental disorders | 93.242 | | 119487 | 46,604 | - |
| Brigham and Women's Hospital, Inc - Rare and common variants in complex disease | 93.242 | | 117943 | 211,174 | - |
| Cambridge Health Alliance - Medicaid Value Based Payment Models and Healthcare Equity for Adults with Serious Mental Illnesses | 93.242 | | 3304-1- HMS | 25,616 | - |
| Case Western Reserve University - The Brainstorm Project: A Collaborative Approach to Developing the Neuroethics of Bioengineered Brain Modeling Research | 93.242 | | RES514724 | 110,851 | - |
| Children's Hospital Boston - 1/2 Somatic mosaicism and autism spectrum disorder | 93.242 | | GENFD0001705976 | 437,645 | - |
| Children's Hospital Boston - Admin Core: Complement regulation and critical periods in diverse CNS cell types | 93.242 | | GENFD0001694650 | 22,513 | - |
| Children's Hospital Boston - An environment-wide association study in autism spectrum disorders using novel bioinformatics methods and metabolomics via mass spectrometry | 93.242 | | GENFD0001732423 | 118,524 | - |
| Children's Hospital Boston - Complement regulation and critical periods in diverse CNS cell types | 93.242 | | GENFD0001696759 | 396,172 | - |
| Children's Hospital Boston - Neural-immune mechanisms and synaptic connectivity in psychiatric illness | 93.242 | | GENFD0001696650 | 111,822 | - |
| Children's Hospital Boston - Novel epigenetic mechanisms in neuronal development and cognitive function | 93.242 | | GENFD0001717137 | 88,375 | - |
| Children's Hospital Boston - Research Support Core: Complement regulation and critical periods in diverse CNS cell types | 93.242 | | GENFD0001696649 | 163,587 | - |
| Cold Spring Harbor Laboratory - A Comprehensive Center for Mouse Brain Cell Atlas | 93.242 | | 64580221 / 64580229 | 2,376,609 | - |

**Harvard University**
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| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Dartmouth-Hitchcock Medical Center - Peer Support and Mobile Technology Targeting Cardiometabolic Risk Reduction in Young Adults with SMI | 93.242 | | GC10036-01-05 | 9,442 | - |
| Desmond Tutu HIV Foundation - Design and delivery of combination HIV prevention in young South African women | 93.242 | | NIH-3P-HC-04 | 34,521 | - |
| FlySorter, LLC - A Modular Automated Platform for Large-scale Drosophila Experiments and Handling | 93.242 | | No Award Number | 32,676 | - |
| Icahn School of Medicine at Mount Sinai - Somatic Mosaicism in Schizophrenia and Control Brains | 93.242 | | 0255-0428-4609 | 167,160 | - |
| Massachusetts General Hospital - 2/7 Psychiatric Genomics Consortium: Finding actionable variation | 93.242 | | 228900 | 26,742 | - |
| Massachusetts General Hospital - Improved multifactorial prediction of suicidal behavior through integration of multiple datasets | 93.242 | | 233187 | 23,718 | - |
| Massachusetts General Hospital - Machine Learning for Data-driven Subtyping in Depression | 93.242 | | 233133 | 253,408 | - |
| Massachusetts Institute of Technology - A Molecular and Cellular Atlas of the Marmoset Brain | 93.242 | | S4495 PO 329629 | 753,984 | 294,380 |
| Massachusetts Institute of Technology - Network-based prediction and validation of causal schizophrenia genes and variants | 93.242 | | S4614 | 215,286 | - |
| Massachusetts Institute of Technology - Network-based prediction and validation of causal schizophrenia genes and variants | 93.242 | | S4616 | 17,455 | - |
| Rand Corporation - Improving Value of Publicly Funded Mental Health Care | 93.242 | | 9920160099 | 169,848 | - |
| Regents of the University of California - Irvine - Understanding neural circuits for associative memory in the lateral entorhinal cortex | 93.242 | | 2019-3822 | 17,160 | - |
| Regents of the University of California - Los Angeles - Joint Genomic and Statistical Analyses of Schizophrenia and Bipolar to Decipher Genetic Susceptibility | 93.242 | | 2000GVR227 | 106,489 | - |
| Regents of the University of California - San Diego - Efficacy of ART to interrupt HIV transmission networks | 93.242 | | 58328838 | 7,552 | - |
| Regents of the University of California - San Diego - Psychiatric Genomics Consortium for PTSD | 93.242 | | 123557538 | 70,545 | - |
| Regents of the University of California - San Diego - Psychiatric Genomics Consortium for PTSD | 93.242 | | 78931958 | 2,534 | - |
| Rutgers University - New Brunswick - Real-time Intervention for Reducing Suicide Risk | 93.242 | | 942 | 42,340 | - |
| Rutgers University - New Brunswick - Using ambulatory physiological monitoring to improve detection of harmful behaviors on adolescent inpatient psychiatry units | 93.242 | | 920 | 39,407 | - |
| San Diego State University - Enhanced Linkage to HIV Care and Treatment following Home-Based HIV testing in Rural Uganda | 93.242 | | SA0000486 | 19,574 | - |
| The Broad Institute - Genetic neuroscience: How human genes and alleles shape neuronal phenotypes | 93.242 | | 5000482-5500001103 | 786,711 | - |
| The Broad Institute - Genetic neuroscience: How human genes and alleles shape neuronal phenotypes | 93.242 | | 500483-5500001075 | 785,163 | - |
| The Broad Institute - Psychosis Genetics Research in Africa: Building Capacity by Investing in People | 93.242 | | 5000701-5500001338 | 133,947 | - |
| The Broad Institute - Statistical methods to localize disease heritability and identify biological mechanisms | 93.242 | | 5001510-5500001234 | 129,871 | - |
| The McLean Hospital Corporation - Laboratory for Early Psychosis Research (LEAP) - Methods Core | 93.242 | | 401567 | 162,567 | - |
| The McLean Hospital Corporation - Laboratory for Early Psychosis Research (LEAP) – Admin Core | 93.242 | | 401568 | 19,639 | - |
| The McLean Hospital Corporation - Predicting the onset of depression in at-risk adolescents from endophenotype profiles | 93.242 | | 401500 | 20,395 | - |
| Trustees of Boston University - SCH: INT: Collaborative Research: Passive sensing of social isolation and loneliness: A digital phenotyping approach | 93.242 | | 4500003257 | 4,393 | - |
| Trustees of Boston University - Using Causal Inference and Machine Learning Methods to Predict Cognitive Behavioral Treatment Respons | 93.242 | | 4500003098 | 29,740 | - |
| Trustees of Dartmouth College - Mental Health Care Under New Payment Strategies | 93.242 | | R1350 | 38,188 | - |
| University of California, San Diego - Toward a human adult brain cell atlas with single-cell technologies | 93.242 | | 111911793 | 233,532 | - |
| University of Maryland, Baltimore - Internal Dynamics of the Postsynaptic Density | 93.242 | | F301577-3 | 10,909 | - |
| University of Maryland, College Park - Effects of Early Psychosocial deprivation on mental health in early adulthood | 93.242 | | 85120-Z0264204 | 8,484 | - |
| University of North Carolina - Chapel Hill - Do dimensions of adversity differentially predict neural development and psychopathology in young children | 93.242 | | 5112038 | 35,058 | - |
| University of North Carolina - Chapel Hill - Longitudinal Assessment of Post-traumatic Syndromes | 93.242 | | 5115554 | 733,900 | - |
| University of North Carolina - Chapel Hill - Longitudinal Assessment of Post-traumatic Syndromes | 93.242 | | 5115555 | 81,335 | - |
| University of North Carolina - Chapel Hill - Multilevel Biomarkers for Suicidal Behavior: From Interpersonal Stress to Gene Expression in a Longitudinal Study of Adolescent Girls | 93.242 | | 5101900 | 79,249 | - |
| University of Pennsylvania - Statistical methods in mHealth to signal interventional needs for mental health patients | 93.242 | | 576460 | 4,118 | - |
| University of Pittsburgh Medical Center - Imaging the Suicidal Mind using Neurosemantics Signatures of Suicidal State | 93.242 | | CNVA00059460 (131200-2) | 20,834 | - |
| University of Rochester - Neurocircuitry of OCD: Effects of Modulation - Core C and Project 3 | 93.242 | | 416629-G/ URFAOGR510948 | 411,715 | - |
| University of Washington - HIV self-testing and PrEP to increase testing and prevention uptake among male partners and improve postpartum ART use in PMTCT B+ programs in Uganda | 93.242 | | UWSC10153 | 74,705 | - |
| University of Washington - Integrated PrEP and ART delivered in Ugandan public health clinics to improve HIV and ART outcomes for HIV serodiscordant couples | 93.242 | | UWSC10102 | 86,150 | - |
| Washington University - Mapping the Human Connectome During Typical Development | 93.242 | | WU-19-438 | 730,116 | - |
| **Total for CFDA 93.242** | | | | 11,436,630 | 294,380 |
| RTI International - Mental Disorders Prevalence Study (MDPS) | 93.243 | | 888-20-07-03 | 15,755 | - |
| **Total for CFDA 93.243** | | | | 15,755 | - |
| International Agency for Research on Cancer - A pooling project on alcohol use and risk of cancers with inconsistent prior evidence, with an emphasis in non-smokers | 93.273 | | CRA/NMB/2019/2 | 176,035 | - |
| San Diego State University Research Foundation - Administrative Core of the CIFASD (U24) | 93.273 | | SA0000604 | 34,572 | - |
| University of North Carolina - Greensboro - Alcohol consumption and related comorbid conditions: health state utilities for economic evaluation | 93.273 | | 20190410.1 | 39,573 | - |
| Washington University - Alcohol, Gut Dysbiosis, Endotoxemia, and Colorectal Cancer | 93.273 | | WU-20-396 | 8,054 | - |
| **Total for CFDA 93.273** | | | | 258,234 | - |
| Brandeis University - Center to Improve System Performance of Substance Use Disorder Treatment: Administrative Core | 93.279 | | 403772 (formerly 403586) | 23,119 | - |
| Brandeis University - Center to Improve System Performance of Substance Use Disorder Treatment: Research Core | 93.279 | | 403773 (formerly 403587) | 153,195 | - |
| Brigham and Women's Hospital, Inc - The Impact of Prescription Opioid Use on Pregnancy Outcomes | 93.279 | | 117817 | 62,513 | - |
| Children's Hospital Boston - Finding the projection-specific dopaminergic synaptic organizers | 93.279 | | GENFD0001659942 | 7,390 | - |
| Johns Hopkins University - Consumer-Directed Health Plans and Substance Use Disorder Treatment | 93.279 | | 2004055395 | 118,496 | - |
| Massachusetts General Hospital - The Impact of Medicaid Plans on Access to and Quality of SUD Treatment | 93.279 | | 232747 | 249,568 | 27,200 |
| Rand Corporation - Developing Plans for State Use of Opioid Settlement Funds | 93.279 | | SCON-00000304 | 22,414 | - |
| Rand Corporation - Opioid Prescribing Practices in Adolescents and State Policies | 93.279 | | 9920190088 | 14,754 | - |
| The Pennsylvania State University - NIDA Innovative Methods for Constructing Just-In-Time Adaptive Interventions | 93.279 | | 5692-HU-DHHS-9838 | 343,151 | - |
| **Total for CFDA 93.279** | | | | 994,600 | 27,200 |

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|---|---|---|---|---|---|
| Aptitude Medical Systems, Inc. - Topical Delivery of Therapeutic Aptamer | 93.286 | | No Award Number | 54,308 | - |
| Columbia University - Multi-tissue platform for modeling systemic pathologies | 93.286 | | 2(GG008687-04) | 7,891 | - |
| Columbia University - Multi-tissue platform for modeling systemic pathologies | 93.286 | | 2(GG015644) | 78,189 | - |
| Massachusetts General Hospital - Connectome 2.0: Developing the next generation human MRI scanner for bridging studies of the micro-meso-and macro-connectome | 93.286 | | 233327 | 52,364 | - |
| Massachusetts General Hospital - Vascularized kidney organoids on chip for efficacy and toxicity testing of somatic genome editing | 93.286 | | 235320 | 31,290 | - |
| Massachusetts Institute of Technology - Deep learning analysis for DNA damage assays | 93.286 | | S4699/ PO 245053 | 57,533 | - |
| The University of Memphis - Center of Excellence for Mobile Sensor Data to Knowledge (MD2K) | 93.286 | | 5-40604 | 9,545 | - |
| University of North Carolina - Chapel Hill - QuBBD: Statistical and Visualization Methods for PGHD to Enable Precision Medicine | 93.286 | | 5108991 | 75,790 | - |
| **Total for CFDA 93.286** | | | | 366,910 | - |
| Brigham and Women's Hospital, Inc - Enhanced measurement and causal modeling of sleep electrophysiology to better understand sleep disparities | 93.307 | | 122194 | 14,082 | - |
| Fundacion de Investigacion - Food access, social connectedness, and allostatic load after a natural disaster: a mixed-methods study | 93.307 | | R21MD013650 | 32,406 | - |
| Massachusetts General Hospital - Mechanisms underlying racial/ethnic disparities in mental disorders | 93.307 | | 227351 | 4,997 | - |
| Massachusetts General Hospital - Medicare Policy Effects on Mental Health Care Disparities | 93.307 | | 230084 | 44,684 | - |
| New York University - Impact of Social Cohesion and Social Capital in PrEP Uptake and Adherence Among Transwomen of Color | 93.307 | | 18-A0-00-1001313 | 13,387 | - |
| Rand Corporation - Improving Minority Health by Monitoring Medicaid Quality, Disparities and Value | 93.307 | | 9920180018 | 368,356 | - |
| Regents of the University of California - San Francisco - Reducing Oral Health Disparities in Children: Assessing the Multilevel Impact of a Standardized | 93.307 | | 11566sc | 64,719 | - |
| University of South Florida - Epigenomic Predictors of PTSD and Traumatic Stress in an African American Cohort | 93.307 | | 6408-1117-00-C | 38,377 | - |
| Yale University - Environmental Health Disparities in an Older Population | 93.307 | | GR101389 (CON-80001010) | 79,898 | - |
| **Total for CFDA 93.307** | | | | 660,906 | - |
| Baylor College of Medicine - Admin Supplement: Beyond pairwise DNA contacts: exploring higher-order genome structure using proximity ligation | 93.310 | | 7000000868 | 40,193 | - |
| Board of Regents of the University of Wisconsin System - U.S. Childhood Respiratory and Environment Workgroup (CREW) | 93.310 | | 304 | 207,502 | - |
| Brigham and Women's Hospital, Inc - Multi-omic approaches to mechanisms of vitamin D, environmental influences, and the microbiome on asthma | 93.310 | | 119919 | 2,851 | - |
| Brigham and Women's Hospital, Inc - New approaches to optimizing the application and measuring the impact of community-based tuberculosis interventions | 93.310 | | 122469 | 11,987 | - |
| Harvard Pilgrim Health Care, Inc - Common and distinct early environmental influences on cardiometabolic and respiratory health: Mechanisms and methods | 93.310 | | PH000615D | 199,631 | - |
| Icahn School of Medicine at Mount Sinai - ECHO Consortium on Perinatal Programming of Neurodevelopment | 93.310 | | 0255-2294-4609 | 64,407 | - |
| Massachusetts General Hospital - Designer probiotics for the treatment of intestinal infection and inflammation | 93.310 | | 229595 | 157,439 | - |
| Mount Sinai Medical Center - CHEAR Center for Data Science | 93.310 | | 0255-0241-4609 | 8,547 | - |
| Regents of the University of California - San Diego - KULMAP: Human Kidney, urinary tract and lung mapping center | 93.310 | | 117273558 | 83,453 | - |
| Scripps Research Institute - Technology to Empower Changes in Health (TECH) Network Participant Technologies Center - S4S YR4 | 93.310 | | 5-54135 | 379,551 | - |
| University of North Carolina - Chapel Hill - Illuminating Function of the Understudied Druggable Kinome | 93.310 | | 5115153 | 541,203 | - |
| **Total for CFDA 93.310** | | | | 1,696,764 | - |
| Brigham and Women's Hospital, Inc - Kidney Microphysiological Analysis Platforms (MAP) to Optimize Function and Model Disease | 93.350 | | 118085 | 34,314 | - |
| Brigham and Women's Hospital, Inc - Kidney Microphysiological Analysis Platforms (MAP) to Optimize Function and Model Disease | 93.350 | | 122148 | 130,480 | - |
| Children's Hospital Boston - Instrumenting the Delivery System for a Genomics Research Information Commons | 93.350 | | GENFD0001706579 | 303,854 | - |
| Massachusetts Institute of Technology - Cartilage-Bone-Synovium MPS: Musculoskeletal Disease Biology in Space | 93.350 | | S4428 PO 327346 | 87,355 | - |
| University of Pittsburgh Medical Center - ACT Supplement | 93.350 | | 00000243 (132627-2) | 772,921 | - |
| **Total for CFDA 93.350** | | | | 1,328,924 | - |
| Brigham and Women's Hospital, Inc - A Community Zebrafish Resource for Modeling GWAS Biology | 93.351 | | 119850 | 247,693 | - |
| Ramona Optics, Inc. - High-resolution, parallelized imaging of freely swimming zebrafish with a gigapixel microscope | 93.351 | | 2R44OD024879-02 | 134,339 | - |
| The Jackson Laboratory - Teaching the Genome Generation: Professional Development for Genomics Instruction in Rural and Urban High Schools | 93.351 | | 210239-0119-02 | 9,548 | - |
| **Total for CFDA 93.351** | | | | 391,580 | - |
| Dana-Farber Cancer Institute - The Cellular Geography of Therapeutic Resistance in Cancer | 93.353 | | 1206302 | 56,884 | - |
| Oregon Health and Science University - Human Tumor Atlas Trans-Network Project SARDANA: Shared Repositories, Data, Analysis, and Access | 93.353 | | 1013337HARVARDB6 | 45,666 | - |
| Oregon Health and Science University - Omic and Multidimensional Spatial Atlas of Metastatic Breast and Prostate Cancers | 93.353 | | 1013337 HARVARD | 659,777 | - |
| **Total for CFDA 93.353** | | | | 762,327 | - |
| Dana-Farber Cancer Institute - Passive Data to Improve Outcomes in Advanced Cancer | 93.361 | | 1169301 | 117,024 | - |
| **Total for CFDA 93.361** | | | | 117,024 | - |
| Baylor College of Medicine - Integrative Analysis of Lung Cancer Etiology and Risk | 93.393 | | 7000000921 | 117,909 | - |
| Baylor College of Medicine - Predictors of Early Stage Lung Cancer Recurrence | 93.393 | | 7000000918 | 47,515 | - |
| Brigham and Women's Hospital, Inc - Comprehensive characterization of prostate stromal gene expression and association with lethal prostate cancer | 93.393 | | 118830 | 16,396 | - |
| Brigham and Women's Hospital, Inc - Accelerating Transdisciplinary Epidemiology of Colorectal Cancer | 93.393 | | 121840 | 122,425 | - |
| Brigham and Women's Hospital, Inc - Long term multidisciplinary study of cancer in women: The Nurses Health Study | 93.393 | | 111048 | 5,187 | - |
| Brown University - Inference and Validation of Chromosomes 3D Structure via Statistical Shape Analysis of Elastic Curves Models | 93.393 | | 1158 | (8,120) | - |
| Dana-Farber Cancer Institute - A functional genomic approach to identification and interpretation of germline-tumor genetic interactions | 93.393 | | 1201302 | 81,127 | - |
| Dana-Farber Cancer Institute - Accelerating Transdisciplinary Epidemiology of Colorectal Cancer | 93.393 | | 1261104 | (20,747) | - |
| Dana-Farber Cancer Institute - Identifying PTSD in Young Adult Cancer Survivors in the DSM-5 Era Are Newly Revised PRO Measures Accurate Compared to a Structured Diagnostic Interview | 93.393 | | 1201802 | 7,107 | - |
| Dana-Farber Cancer Institute - Individualizing Surveillance Mammography for Older Breast Cancer Survivors | 93.393 | | 1170601 | 24,587 | - |
| Health Research, Inc. - Consortium on Methods Evaluating Tobacco (COMET): Filter Ventilation and Product Standards | 93.393 | | 289-01 | 36,037 | - |
| Indiana University - Integrating Genetics of Gene Expression into Pathway Analysis for SCC GWAS | 93.393 | | IN-4679755-HC | 3,268 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Lawrence Berkeley National Lab - Structural Cell Biology of DNA Repair Machines | 93.393 | | 7337766 | 55,452 | - |
| Massachusetts General Hospital - Inflammation and Colorectal Neoplasia | 93.393 | | 226172 | 86,186 | - |
| Mayo Clinic - Risk and penetrance of mutations from breast cancer testing panels | 93.393 | | HAR-195385-07 | 1,633 | - |
| Memorial Sloan Kettering Cancer Center - Characterizing the role of glucosamine and chondroitin supplements in the prevention of colorectal tumors | 93.393 | | BD523707B | 40,197 | - |
| Memorial Sloan Kettering Cancer Center - The Impact of DNA Damage Repair Abnormalities in Prostate Cancer | 93.393 | | BD526699 | 28,917 | - |
| NIH/NCI - Predicted lean body mass, fat mass, and risk of lung, pancreatic, colorectal, breast, and prostate cancers | 93.393 | | 5R03CA223619-02 | 86,127 | - |
| Ohio State University - Pro-inflammatory and Hyper-insulinemic Dietary Patterns and Colorectal Cancer Risk: Role of the Metabolome | 93.393 | | 60075663 | 31,632 | - |
| Regents of the University of California - San Diego - Elucidating the role of nascent RNA in enhancer-promoter communication and three-dimensional genome organization | 93.393 | | 92851495 | 52,503 | 43,760 |
| St. Jude Children's Research Hospital - Role of the SWI/SNF complex in tumor suppression | 93.393 | | 112260080-7899464 | 86,943 | - |
| St. Jude Children's Research Hospital - The Function of Snf5, an Epigenetic Tumor Suppressor | 93.393 | | 112261160-7892780 | 45,847 | - |
| Stanford University - Evaluation of genetic, clinical, and environmental risk factors to establish effective screening strategies for second primary lung cancer | 93.393 | | 61958611-130956 | 42,936 | - |
| Trustees of Boston University - A Prospective Investigation of the Oral Microbiome and Pancreatic Cancer | 93.393 | | 4500002808 | 69,932 | - |
| University of Texas - Dallas - A Bayesian Meta-Analysis Approach for Estimation of Penetrance and its Application to PALB2 gene for Breast Cancer Risk | 93.393 | | 1907701 | 1,083 | - |
| University of Washington - Quantifying and Characterizing the shared genetic contribution to common cancers | 93.393 | | UWSC9239 | 114,656 | - |
| Vanderbilt University Medical Center - Effects of Expanded Coverage on Access, Health Care and Health in the South | 93.393 | | VUMC56386 | 163,381 | - |
| **Total for CFDA 93.393** | | | | 1,340,116 | 43,760 |
| Dana-Farber Cancer Institute - Circulating Biomarker Consortium for Pancreatic Cancer Early Detection | 93.394 | | 1283204 | 25,048 | - |
| Dana-Farber Cancer Institute - GENOTYPE AND IMAGING PHENOTYPE BIOMARKERS IN LUNG CANCER | 93.394 | | 1235004 | 62,464 | - |
| Dana-Farber Cancer Institute - QUANTITATIVE RADIOMICS SYSTEM DECODING THE TUMOR PHENOTYPE | 93.394 | | 1236205 | 98,025 | - |
| Emory University - Emory, Harvard and Univ. of Washington Prostate Cancer Biomarker Center | 93.394 | | A275021 | 43,066 | - |
| Fred Hutchinson Cancer Research Center - Statistical Methods for Prospective Evaluation of Biomarkers | 93.394 | | 999763 | 49,489 | - |
| Massachusetts General Hospital - INTEGRATED MODELS FOR METASTATIC PHENOTYPE AND OUTCOME PREDICTION IN OSTEOSARCOMA | 93.394 | | 227062 | 6,682 | - |
| RareCyte, Inc. - Highly Multiplexed Analysis of Solid Tumors and Liquid Tissues by Cyclic Immunofluorescence | 93.394 | | 1R41CA224503-01A1SUB | 14,532 | - |
| University of Massachusetts Medical School - Weight Management Counseling in Medical School: A Randomized Controlled Trial | 93.394 | | OSP2016161 | 21,383 | - |
| **Total for CFDA 93.394** | | | | 320,689 | - |
| Auburn University - Proteasome inhibitors for the treatment of Solid Tumors | 93.395 | | 17-PHAR-201318-HMS | 2,801 | - |
| Dana-Farber Cancer Institute - NOVEL RANDOMIZED CONTROLLED TRIALS OF VITAMIN D SUPPLEMENTATION IN PATIENTS WITH COLORECTAL CANCER: IMPACT ON SURVIVAL AND BIOLOGY | 93.395 | | 1299503 | 26,479 | - |
| Dana-Farber Cancer Institute - Strengthening Patient and Caregiver Supports in Ovarian Cancer with Palliative Care: Pilot RCT of BOLSTER | 93.395 | | 1208501 | 1,647 | - |
| Dana-Farber Cancer Institute - The molecular basis of IMiD induced neo-substrate recruitment to the CRL4CRBN ubiquitin E3 ligase | 93.395 | | 1300003 | 16,561 | - |
| Massachusetts General Hospital - Abbreviated Targeted Therapy to Improve Anti-PD-1 Inhibitor Efficacy in Melanoma | 93.395 | | 232616 | 174,252 | - |
| Massachusetts General Hospital - Dietary sulfur, the gut microbiome, and colorectal cancer | 93.395 | | 227950 | 304,807 | - |
| Massachusetts General Hospital - Strategies to Overcome Immune Resistance in Head and Neck Cancers | 93.395 | | 235469 | 2,369 | - |
| Massachusetts General Hospital - Transcriptional mechanisms and melanoma - Project 2 | 93.395 | | 235351 | 222,986 | - |
| Regents of the University of Michigan - Novel use of mHealth data to identify states of vulnerability and receptivity to JITAIs | 93.395 | | SUBK00008226 | 52,115 | - |
| **Total for CFDA 93.395** | | | | 804,017 | - |
| Beth Israel Deaconess Medical Center - A multi-faceted approach to identifying K-Ras synthetic lethal relationships | 93.396 | | 1060888 | 22,174 | - |
| Beth Israel Deaconess Medical Center - Basic and translational studies of Ras-mutant colorectal cancer | 93.396 | | 1027625 | (475) | - |
| Brigham and Women's Hospital, Inc - Identifying new therapeutic avenues to selectively target tumors with uncontrolled mTORC1 activation | 93.396 | | 120102 | 210,964 | - |
| Brigham and Women's Hospital, Inc - Molecular Pathogenesis of the Hamartoma Syndromes P01 Project 1: Identifying new therapeutic avenues to selectively target tumors with uncontrolled mTORC1 activation | 93.396 | | 120102 | 267,926 | - |
| Children's Hospital Boston - Advanced Microscopy Tools for Ultra-High Throughput Spatially Resolved Single-Cell Transcriptomics | 93.396 | | GENFD0001829879 | 8,142 | - |
| Cleveland Clinic Lerner College of Medicine of CWRU - CryoPen: An Innovative Treatment Cervical Pre-cancer in Low-Resource Settings | 93.396 | | 1142-SUB | 3,185 | - |
| Dana-Farber Cancer Institute - Developing Informatics Technologies to Model Cancer Gene Regulation | 93.396 | | 1170701 | 22,358 | - |
| Massachusetts General Hospital - Reverse transciptase inhibitor effects on the mobillome of colon cancer | 93.396 | | 234829 | 32,893 | - |
| Memorial Sloan Kettering Cancer Center - Interrogating the Evolutionary Dynamics of Cancer for Clinical Benefit and Actionability. | 93.396 | | BD523873B | 97,647 | - |
| Regents of the University of California - San Francisco - Genetic Models of exRNA Communication | 93.396 | | 7798sc | (7,041) | - |
| Stanford University - SCH: INT: Collaborative Research: Intelligent Information Sharing: Advancing Teamwork in Complex Care | 93.396 | | 62023614-137827 | 174,334 | - |
| University of Pittsburgh - Pathogenesis of Cancer - Role of EGF Receptor Endocytosis | 93.396 | | AWD00001291 (133630-1) | 26,860 | - |
| Whitehead Institute for Biomedical Research - Mechanisms of Breast Development and Carcinogenesis | 93.396 | | 11-1786-2004 | (698) | - |
| **Total for CFDA 93.396** | | | | 858,269 | - |
| Beth Israel Deaconess Medical Center - DF/HCC Kidney Cancer SPORE | 93.397 | | 1060974 | 71,283 | - |
| Beth Israel Deaconess Medical Center - DF/HCC Kidney Cancer SPORE: Development Research Project Identification and Validation of Immune Targets to Augment PD-1/VEGFR2 Directed Therapy | 93.397 | | 1062110 | 36,381 | - |
| Dana-Farber Cancer Institute - 2/2 The UMB-DF/HCC U54 Comprehensive Partnership for Cancer Disparities Research | 93.397 | | 1217809 | 64,641 | - |
| Dana-Farber Cancer Institute - Adaptation of an evidence-based HPV prevention program for community- and faith-based organizations serving low socioeconomic status and racial/ethnic minority populations. | 93.397 | | 1300956 | 36,545 | - |
| Dana-Farber Cancer Institute - Cancer Center Support Grant | 93.397 | | HSPH-54 | 303,647 | - |
| Dana-Farber Cancer Institute - Dana Farber/ Harvard Cancer Center SPORE in Gastrointestinal Cancer | 93.397 | | 1132211 | 36,076 | - |
| Dana-Farber Cancer Institute - Dana-Farber/Harvard Cancer Center Breast Cancer SPORE Grant | 93.397 | | 2018-1050 | 18,670 | - |
| Dana-Farber Cancer Institute - Dana-Farber/Harvard Cancer Center Support Grant | 93.397 | | HMS-55 | 939,959 | - |
| **Total for CFDA 93.397** | | | | 1,507,202 | - |

**Harvard University**
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| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Westat Corporation - SEER Program | 93.398 | | 6473-S05 | 6,374 | - |
| **Total for CFDA 93.398** | | | | 6,374 | - |
| Rehabilitation Institute of Chicago - Rehabilitation Engineering Research Centers (RERC) on Strategies, Techniques, and Interventions | 93.433 | | 7247 | 90,054 | - |
| **Total for CFDA 93.433** | | | | 90,054 | - |
| Joslin Diabetes Center - The impact of vagal nutrient sensing neurons on systemic metabolism | 93.647 | | P30DK036836-32 LiberlesHarvard | 33,145 | 25,164 |
| **Total for CFDA 93.647** | | | | 33,145 | 25,164 |
| Partners in Health - Policy, System and Environmental Change for Health Navajo Communities | 93.738 | | 40 | (1,864) | - |
| **Total for CFDA 93.738** | | | | (1,864) | - |
| Massachusetts General Hospital - MA/Region 1 Partnership for Regional Health Disaster Response | 93.817 | | 233381 | 84,745 | - |
| **Total for CFDA 93.817** | | | | 84,745 | - |
| Beth Israel Deaconess Medical Center - Altered Cell-Cell Coupling in Arrhythmogenic Cardiomyopathy | 93.837 | | 1060872 | 140,154 | - |
| Beth Israel Deaconess Medical Center - Mechanisms of Prosthetic Arterial Graft Failure | 93.837 | | 1029633 | 133,104 | - |
| Beth Israel Deaconess Medical Center - Use of Registries, Claims and Health System Data to Enhance the Evaluation of Cardiovascular Therapies in Clinical Trials | 93.837 | | 1029815 | 44,960 | - |
| Board of Regents of the University of Wisconsin System - Effects of HIV Infection and HIV Disease Measures on Arterial Function | 93.837 | | 866K445 | 670 | - |
| Brigham and Women's Hospital, Inc - Adipose Dependent Mechanisms of Dietary Protein Restriction Protective Effects on Vein Graft | 93.837 | | 115081 | 15,817 | - |
| Brigham and Women's Hospital, Inc - Boston Biomedical Innovation Center | 93.837 | | 114756 | 67,576 | - |
| Brigham and Women's Hospital, Inc - Pre-DETERMINE: Biologic Markers and MRI SCD Cohort Study | 93.837 | | 116706 | 13,421 | - |
| Brigham and Women's Hospital, Inc - Risk Factors for Ischemic Stroke in Women | 93.837 | | 113892 | 9,152 | - |
| Brigham and Women's Hospital, Inc - Risk Factors of CVD in Women | 93.837 | | 120938 | 22,495 | - |
| Brigham and Women's Hospital, Inc - Targeting erythropoietin-based therapeutics | 93.837 | | 116479 | (804) | - |
| Cincinnati Children's Hospital Medical Center - Administrative Coordinating Center: Cardiovascular Development and Pediatric Cardiac Genomics Consortia. | 93.837 | | 138275 | 30,757 | - |
| Cincinnati Children's Hospital Medical Center - Down Syndrome Admin Supp to ACC: Cardiovascular Development and Pediatric Cardiac Genomics Consortia | 93.837 | | FP00001653 Supplement | 354,405 | - |
| Columbia University - Phosphorylation-dependent regulation of calcium channels by macromolecular complexes | 93.837 | | 1(GG015807-01) | 43,694 | - |
| Columbia University - ROLE OF RAGE IN BICUSPID AORTIC VALVE SYNDROME | 93.837 | | 1(GG013569) | 63,841 | - |
| Duke University - Mechanisms of Maladaptation in Heart Failure | 93.837 | | A032119 | 44,368 | - |
| Duke University - Novel Mechanisms and Therapies in Heart Failure | 93.837 | | A031557 | 78,409 | - |
| Emory University - Worksite lifestyle program for reducing diabetes and CVD risk in India | 93.837 | | A177305 | 56,959 | - |
| Icahn School of Medicine at Mount Sinai - Data Coordination and Integration Center for LINCS-BD2K | 93.837 | | 0255-7892-4609 | 2,509 | - |
| Icahn School of Medicine at Mount Sinai - Influence of prenatal air pollutant and stress exposures on sleep outcomes in urban preschool-aged children | 93.837 | | 0255-C311-4609 | 11,155 | - |
| Joslin Diabetes Center - Metabolic Pathways of Increased Cardiovascular Risk in Type 2 Diabetes | 93.837 | | 100026 | 34,590 | - |
| Massachusetts General Hospital - Identifying novel cardiopulmonary disease intervention targets among people with HIV in rural sub-Saharan Africa | 93.837 | | 232954 | 7,721 | - |
| Massachusetts General Hospital - Impact of cardiovascular disease on proliferation and genetic diversity of hematopoietic stem cells (Project 4) | 93.837 | | 235112 | 22,530 | - |
| Massachusetts General Hospital - Mechanisms of Cardiac Dysfunction in HIV and the Effect of Statins | 93.837 | | 230744 | 41,124 | - |
| Massachusetts General Hospital - Primary prevention of vascular events in HIV | 93.837 | | 224846 | 295,059 | - |
| Massachusetts General Hospital - Promoting employee health through the worksite food environment | 93.837 | | 226216 | 31,578 | - |
| Northeastern University - Comparative Assessment of Modifying Social Determinants to Reduce Cardiovascular Disease Burden and Disparities | 93.837 | | 500537-78050 | 20,075 | - |
| Tufts University - Diet and Metabolic Risks: Joint Drivers of Global Epidemiologic Transition | 93.837 | | 101467-00001 | 8,472 | - |
| University at Buffalo (State University of New York) - Cardiac Toxicity in Perinatally HIV-Infected Adolescents and Young Adults, a Longitudinal Study | 93.837 | | R1186469 | 22,098 | - |
| University of Massachusetts Medical Center - Pediatric Practice-based Obesity Intervention to Support Families: FITLINE | 93.837 | | OSP2017060 | 33,399 | - |
| Vanderbilt University - Outcome Dependent Sampling Studies of Longitudinal Data: Design and Analysis | 93.837 | | VUMC58615 | 153,567 | - |
| Washington University School of Medicine - The Impact of Bundled Payments for Cardiopulmonary Disease on High-Risk Populations | 93.837 | | WU-20-85 | 271,550 | - |
| **Total for CFDA 93.837** | | | | 2,074,405 | - |
| Brigham and Women's Hospital, Inc - Genetic and Genomic Characterization of the Occurrence and Progression of Interstitial Lung Abnormalities | 93.838 | | 117432 | 59,766 | - |
| Brigham and Women's Hospital, Inc - Genetic Epidemiology of COPD (2 of 2) | 93.838 | | 117868 | 330,052 | - |
| Brigham and Women's Hospital, Inc - Interstitial Lung Abnormalities: Defining the Phenotype, Causes, and Consequenses | 93.838 | | 120957 | 45,947 | - |
| Brigham and Women's Hospital, Inc - Manipulating Tissue Strain in Surgical Repair | 93.838 | | 120026 | 36,973 | - |
| Brigham and Women's Hospital, Inc - Systems Biology of Airway Disease | 93.838 | | 115975 | 69,905 | - |
| Brigham and Women's Hospital, Inc - Therapeutic modulation of zinc for lung injury and mechanobiology | 93.838 | | 121004 | 113,176 | - |
| Children's Hospital Boston - Environmental Risk Factors for Pediatric Sleep Disordered Breathing | 93.838 | | GENFD0001697306 | 81,006 | - |
| COPD Foundation - Network Management Core (NEMO) for the Pulmonary Trials Cooperative (PTC) | 93.838 | | 001-Amend4 | 21,198 | - |
| Emory University - Household air pollution and health: a multi-country LPG intervention trial | 93.838 | | A188688 | 37,615 | - |
| University of Colorado Denver - Pulmonary Hypertension Data Fusion: Regulatory Science | 93.838 | | FY17.369.009 | 65,314 | - |
| University of Pennsylvania - CEBPD - Medicated Mechanisms of Glucocorticoid Insensitivity in Severe Asthma | 93.838 | | 571226 | 36,038 | - |
| **Total for CFDA 93.838** | | | | 896,990 | - |
| Beth Israel Deaconess Medical Center - Targeting the Endothelium in Sepsis | 93.839 | | 1027662 | 14,035 | - |
| Brigham and Women's Hospital, Inc - Cytoskeletal Mechanisms of Platelet Formation | 93.839 | | 116938 | 11,602 | - |
| Case Western Reserve University - Platelet-inspired Delivery System for Targeted Thrombolytic Therapy | 93.839 | | RES512743 | (6,102) | - |
| Massachusetts General Hospital - Functional dissection of clonal hematopoiesis | 93.839 | | 230441 | 328,795 | - |
| University of Maryland, College Park - Relationship of ambient air pollution exposures with vaso-occlusive pain crises in sickle cell disease | 93.839 | | 66027-Z0155201 | 11,597 | - |
| University of Massachusetts Medical School - Novel Growth Factor Regulators of Early Erythropoieisis | 93.839 | | OSP2018073 | 117,572 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
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| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| University of Pennsylvania - Vascular delivery of nanocarriers by erythrocytes | 93.839 | | 574882 | 144,676 | - |
| **Total for CFDA 93.839** | | | | 622,175 | - |
| University of Massachusetts Medical School - PR-OUTLOOK: PR Young Adults Stress, Contextual, Behavioral and Cardiometabolic Risk | 93.840 | | OSP29967-02 | 26,514 | - |
| **Total for CFDA 93.840** | | | | 26,514 | - |
| Brigham and Women's Hospital, Inc - Acid-Base Status as a Novel Risk Factor for Fractures | 93.846 | | 121220 | 85,719 | - |
| Brigham and Women's Hospital, Inc - Sociodemographic Disparities in SLE Incidence: Behavioral and Psychosocial Factors | 93.846 | | 113176 | 24,283 | - |
| Brigham and Women's Hospital, Inc - VERITY: Value and Evidence in Rheumatology using bioInformaTics, and advanced analytics | 93.846 | | 118064 | 77,013 | - |
| Children's Hospital Boston - Cfp1 Action in Cartilage Development | 93.846 | | GENFD0001296348 | 4,273 | - |
| Children's Hospital Boston - Defining the human articular chondrocyte lineage | 93.846 | | GENFD0001689695 | 14,622 | - |
| Hebrew SeniorLife - The Gut Microbiome and Bone Microarchitecture | 93.846 | | 90094 | 46,152 | - |
| Massachusetts General Hospital - Identifying gene and regulatory networks underlying postnatal tendon growth | 93.846 | | 230508 | 26,852 | - |
| Massachusetts General Hospital - Posttranscriptional control of epidermal progenitors senescence | 93.846 | | 234150 | 110,840 | - |
| Regents of the University of California - San Diego - Leveraging comparative genomics to elucidate the genetic determinants of limb skeletal proportion | 93.846 | | 121580600 | 75,277 | - |
| University of Louisville - Interplay of androgens, microbiota and immunoregulation in lupus | 93.846 | | ULRF 15-0685-01 | 2,869 | - |
| **Total for CFDA 93.846** | | | | 467,900 | - |
| Albert Einstein College of Medicine - Metabolomics signatures underlying diet, lifestyle and gut microbiota for diabetes | 93.847 | | 311433 | 150,831 | - |
| Beth Israel Deaconess Medical Center - Generation of a Cellular Atlas of Adipose Tissue in Mouse and Man | 93.847 | | 1060496 | 368,296 | - |
| Beth Israel Deaconess Medical Center - Leveraging the Rich Diversity of Vagal Motor Neurons to Decode Brain-to-Gut Communication | 93.847 | | 1061842 | 272,995 | - |
| Beth Israel Deaconess Medical Center - Memory Advancement by Intranasal Insulin in Type 2 Diabetes (MemAiD) | 93.847 | | 1028191 | 6,223 | - |
| Boston College - Empowerment as a mechanism for change in childhood obesity prevention | 93.847 | | 5108631-4 | 33,334 | - |
| Boston Medical Center - Boston Obesity Nutrition Research Center | 93.847 | | 7453 | 130,593 | - |
| Boston Nutrition Obesity Research Center - Chronic Inflammation and Obesity: Genetic Susceptibility and the Role of Diet | 93.847 | | 7072 | 22,872 | - |
| Boston Nutrition Obesity Research Center - Mediterranean Diet, Gut Microbiome and Cardiac Structure and Function | 93.847 | | 7521 | 1,696 | - |
| Brigham and Women's Hospital, Inc - Circulating plasma metabolites, diet, and risk of type 2 diabetes | 93.847 | | 118780 | 113,577 | - |
| Brigham and Women's Hospital, Inc - Novel Pathways for Kidney Stone Formation | 93.847 | | 120966 | 66,718 | - |
| Brigham and Women's Hospital, Inc - Risk Factors for and Tissue Biomarker Expression in Primary Hyperparathyroidism | 93.847 | | 110397 | (58) | - |
| Brown University - Impact of Medicaid Expansion on Racial and Socioeconomic Disparities in ESRD | 93.847 | | 1181 | 47,492 | - |
| Children's Hospital Boston - Assessing the relationship between environmental enteric dysfunction and poor growth via a newly developed 11-plex array | 93.847 | | PO:GENFD0001740737 | 5,965 | - |
| Children's Hospital Boston - BA: Dietary Fat and Gallbladder Disease | 93.847 | | GENFD0001677480 | 4,074 | - |
| Children's Hospital Boston - Customized stem cells for clinical applications in blood disorders | 93.847 | | GENFD0001552720 | 119,610 | - |
| Children's Hospital Boston - Mechanisms and Markers of Small Intestinal Epithelial Injury | 93.847 | | GENFD0001606915 | 8,968 | - |
| Children's Hospital Boston - The neuropilin 2 axis in smooth muscle contractility | 93.847 | | GENFD0001688159 | 88,483 | - |
| Children's Hospital Boston - Transcriptional Reprogramming in Podocyte Injury | 93.847 | | GENFD0001663088 | 68,953 | - |
| Duke University - Microbial regulation of host nutrient metabolism | 93.847 | | A031623 | 60,485 | - |
| Harvard Pilgrim Health Care, Inc - New Insights into the Federal Calorie Labeling Law | 93.847 | | PH000668A | 199,111 | - |
| Johns Hopkins University - Sleep Apnea Treatment with Positive Airway Pressure for Prevention of Diabetes Mellitus | 93.847 | | 2004175483 | 7,552 | - |
| Joslin Diabetes Center - Can technology improve self-care in youth with type-1 diabetes | 93.847 | | P30DK036836-31 Dassau Harvard | 60,157 | 51,009 |
| Kaiser Foundation Health Plan of Washington - Long-Term Benefits and Risks of Bariatric Surgery in Integrated Care Systems | 93.847 | | RNG002749-BUDG04-HSPH-00 | 10,576 | - |
| Massachusetts General Hospital - A Prospective Study of Lifestyle, the Gut Microbiome, and Diverticulitis | 93.847 | | 235385 | 78,166 | - |
| Massachusetts General Hospital - Characterization of narrow-spectrum antibiotics from patient isolates of Ruminococcus gnavus | 93.847 | | 228236 | 1,776 | - |
| Massachusetts General Hospital - Deconvoluting the hematopoietic niche under stress | 93.847 | | 227794 | 90,904 | - |
| Massachusetts General Hospital - Infant Sleep Characteristics and Accelerated Growth Trajectories from Birth to 24 months | 93.847 | | 227074 | 84,160 | - |
| Massachusetts General Hospital - Psychological, cognitive, and genetic factors in a behavioral intervention to prevent weight gain | 93.847 | | 231761 | 29,590 | - |
| Rand Corporation - Robust Statistical Methods to Identify and Use Surrogate Markers in Diabetes | 93.847 | | 9920190016 | 44,061 | - |
| Regents of the University of California - San Francisco - Vegetarian dietary patterns and erectile dysfunction in Health Professionals Followup Study" | 93.847 | | 11677sc | 10,086 | - |
| The Broad Institute - A comprehensive platform for novel therapy development from the microbiome | 93.847 | | 5000472-5500001054 | 419,246 | - |
| Tulane University - Nutrigenetics and Nutrigenomics for Precision Weight-Loss Diet Interventions | 93.847 | | TUL-HSC-556076-17-18 | 76,707 | - |
| Tulane University - Obesity Genes, Energy Regulation in Response to Weight-Loss Diets | 93.847 | | TUL-HSC-556619-18/19 | 61,220 | - |
| Tulane University - Weight-Loss Diet Intervention on Cardiometabolic Factors of Gut Microbiota | 93.847 | | TUL-HSC-55400-16-17 | 13,266 | - |
| Tulane University - Weight-Loss Diet Intervention on Cardiometabolic Factors of Gut Microbiota | 93.847 | | TUL-HSC-558086-19-20 | 14,025 | - |
| University of Alabama - Effect of Pitavastatin on Kidney Function in HIV-infected Persons | 93.847 | | 000509533-005 | 32,275 | - |
| University of Kansas Medical Center - Role of claudin-2 in calcium homeostasis and kidney stone disease | 93.847 | | ZAY00030 | 1,202 | - |
| University of Massachusetts Medical School - Humanized Mouse Avatars for T1D | 93.847 | | OSP30522-03 | 122,467 | - |
| University of Pennsylvania - A Large Scale Long-Term Randomized Trial of Nutrition Labeling Interventions | 93.847 | | 574745 | 22,898 | - |
| University of Southern California - (Re)Building a Kidney Partnership Project Program | 93.847 | | 84071314 | 6,509 | - |
| University of Virginia - MD-PSCH Clinical Acceptance of the Artificial Pancreas: The International Diabetes Closed Loop (iDCL) Trial | 93.847 | | GB10282 151300 | 414,348 | 127,977 |
| Yale University - Data and Biostatistics Core : Amazon Center of Excellence in Malaria Research | 93.847 | | GR106222(CON-80001764) | 83,042 | - |
| Yale University - On-body ecosystem for automated insulin delivery in type 1 diabetes | 93.847 | | GR100945 (CON-80000948) | 427,190 | - |
| **Total for CFDA 93.847** | | | | 3,881,641 | 178,986 |
| Beth Israel Deaconess Medical Center - The functional neuroanatomy of the human physiological stress response | 93.853 | | 1061570 | 20,038 | - |
| Brigham and Women's Hospital, Inc - Identification of Presenilin downstream targets in neuronal survival | 93.853 | | 116846 | 202,102 | - |
| Brigham and Women's Hospital, Inc - Identification of exosome signature in serum from ALS patients | 93.853 | | 119414 | 11,591 | - |
| California Institute of Technology - A Brain Circuit Program for Understanding the Sensorimotor Basis of Behavior | 93.853 | | S397744 | 683,265 | 485,912 |
| California Institute of Technology - Comprehensive Analysis of a Decision Circuit | 93.853 | | S447071 | 214,831 | - |
| California Institute of Technology - Neural representation of mating partners by male C. elegans | 93.853 | | S447423 | 86,276 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Children's Hospital Boston - Cell Identity Determination In Human Brain: Somatic mutation and cell lineage | 93.853 | | GENFD0001680550 | 148,023 | - |
| Columbia University - CRCNS: Refining computational models of motor sequence learning and execution | 93.853 | | 1(GG012952-01) | 158,739 | - |
| Columbia University - Project 2-Neural Basis of Motor Pattern Control | 93.853 | | 1(GG012999-03) | 159,331 | - |
| Johns Hopkins School of Medicine - Gene expression underlying serotonin axon regrowth in the adult mammalian brain | 93.853 | | 2003998519 | 73,651 | - |
| Lawrence Berkeley National Lab - Chemical Fingerprinting: cell-type specific DNA repair in the brain | 93.853 | | 7527795 | 22,959 | - |
| Massachusetts General Hospital - Micro-Coil Implants for Cortical Activation | 93.853 | | 229585 | 81,316 | - |
| Massachusetts General Hospital - mRNA Splicing Modulation in Familial Dysautonomia | 93.853 | | 228844 | 126,968 | - |
| Massachusetts General Hospital - Phase 3 trial of inosine for Parkinson's disease CCC | 93.853 | | 226396 | 26,743 | - |
| New York University Langone Medical Center - Project 3: Cracking the Olfactory Code | 93.853 | | 19-A0-00-1002081 | 125,661 | - |
| New York University Langone Medical Center - Project 4: Cracking the Olfactory Code | 93.853 | | 19-A0-00-1002081 | 270,948 | - |
| New York University School of Medicine - Development and Function of 5HT3aR-Expressing Cortical GABAergic Interneurons (Project 1) | 93.853 | | 18-A1-00-008334-01 | 279,315 | - |
| Princeton University - Mechanisms of Neural Circuit Dynamics in Working Memory and Decision-Making | 93.853 | | SUB0000239 | 203,454 | - |
| Regents of the University of California - Berkeley - Specifying the constraints on cerebellar dependent sensorimotor adaptation | 93.853 | | 9885 | 117,839 | - |
| Regents of the University of California - San Diego - Next generation all-optical toolkits for functional analysis of neuropeptide dynamics in neural circuits | 93.853 | | 122333935 | 256,826 | - |
| Stanford University - Automated Phenotyping in Epilepsy | 93.853 | | 62301591-143494 | 143,362 | - |
| Stanford University - Project 3- Neural Basis of Sensory-Guided Actions | 93.853 | | 61745076-130506 | 140,837 | - |
| Tufts Medical Center - Discovery of the Biomarker Signature for Neuropathic Corneal Pain | 93.853 | | 5017155-SERV | 112,441 | - |
| University of Massachusetts - Amherst - A six dimensional connectomics approach to the neural basis of behavior | 93.853 | | 19-010728 C01 | 230,548 | - |
| University of Massachusetts - Lowell - The Gut Microbiome In Parkinson Disease | 93.853 | | S51110000036435 | 85,533 | - |
| University of North Carolina - Bcl-xL-regulated apoptosis in cerebellar development and medulloblastoma treatment | 93.853 | | 5110620 | 61,891 | - |
| University of Pittsburgh - Integrating EHR and Genomics to Predict Multiple Sclerosis Drug Response | 93.853 | | CNVA00055152(128815-3) | 88,527 | - |
| **Total for CFDA 93.853** | | | | 4,133,015 | 485,912 |
| Beth Israel Deaconess Medical Center - Combined Immunologic Approaches to Cure HIV-1 | 93.855 | | 1061554 | 25,671 | - |
| Beth Israel Deaconess Medical Center - Viral dynamics of rebound and control following early treatment of HIV/SIV | 93.855 | | 1061732 | 23,181 | - |
| Beth Israel Deaconess Medical Center - Viral dynamics of rebound and control following early treatment of HIV/SIV | 93.855 | | 1061735 | 33,863 | - |
| Board of Regents of the University of Wisconsin System - Novel antimicrobials targeting MDR pathogens from animal microbial symbionts | 93.855 | | 882K346 | 88,221 | - |
| Board of Regents of the University of Wisconsin System - Novel antimicrobials targeting MDR pathogens from animal microbial symbionts | 93.855 | | 882K442 | 503,085 | - |
| Brandeis University - Developing Homology-Independent Targeted Insertion (HITI) toolkits for molecular genetic manipulation of Drosophila melanogaster and Anopheles gambiae | 93.855 | | 403591 | 50,829 | - |
| Brandeis University - Unraveling the polymodal behavior of sensory transduction receptors | 93.855 | | 403164 | 155,092 | - |
| Brigham and Women's Hospital, Inc - A Pilot Clinical Trial for HIV-1 Eradication | 93.855 | | 114094 | 18,120 | - |
| Brigham and Women's Hospital, Inc - Antiretroviral Drug Resistance in KwaZulu Natal | 93.855 | | 114727 | 14,139 | - |
| Brigham and Women's Hospital, Inc - Core A: Metabolic factors that control the spectrum of human tuberculosis [TBRU] | 93.855 | | 111846 | 29,756 | - |
| Brigham and Women's Hospital, Inc - Core B: Metabolic factors that control the spectrum of human tuberculosis [TBRU] | 93.855 | | 111896 | 30,376 | - |
| Brigham and Women's Hospital, Inc - Finding and Treating Unsuspected and Resistant TB to Reduce Hospital Transmission | 93.855 | | 111945 | 12,400 | - |
| Brigham and Women's Hospital, Inc - Finding and Treating Unsuspected and Resistant TB to Reduce Hospital Transmission | 93.855 | | 111945 | 13,189 | - |
| Brigham and Women's Hospital, Inc - Project 1: Metabolic Factors that control the spectrum of Human Tuberculosis [TBRU] | 93.855 | | 111899 | 20,395 | - |
| Brigham and Women's Hospital, Inc - Project 3: Metabolic factors that control the spectrum of human tuberculosis [TBRU] | 93.855 | | 111903 | 31,024 | - |
| Brigham and Women's Hospital, Inc - Protection of organ transplant from ischemia reperfusion injuries | 93.855 | | 115242 | 6,394 | - |
| Brigham and Women's Hospital, Inc - The Fetal and Childhood Environment, Oxidative Balance, Inflammation and Asthma | 93.855 | | 114196 | (362) | - |
| Brigham and Women's Hospital, Inc - TIM Family of Genes: Role in T Cell Immunity and Tolerance (Core C) | 93.855 | | 112676 | 97,543 | - |
| Case Western Reserve University - Resetting Immune Homeostasis: A Non-Invasive Approach Towards HIV Eradication | 93.855 | | RES514630 | 41,800 | - |
| Children's Hospital Boston - Decidual NK response to infection | 93.855 | | GENFD0001671863 | 219,095 | - |
| Children's Hospital Boston - Optimization and preclinical development of a TB Multiple Antigen Presenting System (MAPS) vaccine | 93.855 | | GENFD0001394794 | 8,428 | - |
| Children's Hospital Boston - School Inner-City Asthma Intervention Study | 93.855 | | GENFD0001578883 | 89,988 | - |
| Children's Hospital Boston - Structural Basis of Coreceptor Recognition by HIV-1 Envelope Spike | 93.855 | | GENFD0001665271 | 93,999 | - |
| Children's Hospital Boston - Structure-function analysis of infection- and vaccine-induced B-cell repertoire | 93.855 | | GENFD0001724525 | 158,549 | - |
| Children's Hospital Boston - Structure-function studies of the membrane-interacting domains of HIV-1 Env spike | 93.855 | | GENFD0001695019 | 381,541 | - |
| FHI Development 360 - HPTN 081 A phase 2b study to evaluate the safety and the efficacy of VRC01 | 93.855 | | PO15004266 | 173,014 | 173,014 |
| Global Alliance for TB Drug Development - Discovery of inhibitors that target the Mtb ClpP1P2 protease | 93.855 | | 2115 | 464,848 | - |
| Harvard Pilgrim Health Care, Inc - Network modeling and robust estimation of the intraclass correlation coefficient to inform the design and analysis of cluster randomized trials for infectious diseases | 93.855 | | AH000680 | 19,079 | - |
| Icahn School of Medicine at Mount Sinai - The Immune Cell Atlas - A Robust Framework to Map the Entire Human Immune System | 93.855 | | 0255-B131-4609 | 141,520 | - |
| Johns Hopkins University - Johns Hopkins University Kampala-Nanning Clinical Trial Unit | 93.855 | | 2003732848 | 31,071 | - |
| Johns Hopkins University - LDR 08 | 93.855 | | 2004436009 | 54,104 | - |
| Massachusetts Eye and Ear Infirmary - Compounds and Strategies for Treating MRSA and VRE | 93.855 | | 530539 | 526,414 | - |
| Massachusetts General Hospital - Assessing measures to eliminate transmission of cholera in Haiti | 93.855 | | 232975 | 46,037 | - |
| Massachusetts General Hospital - Cardiovascular Disease Risk in HIV-infected Women: Sex-Specific Mechanisms of Risk and Risk Reduction among REPRIEVE Trial Participants | 93.855 | | 227111 | 48,041 | - |
| Massachusetts General Hospital - Cost Effectiveness of Preventing HIV Complications | 93.855 | | 226292 | 54,688 | - |
| Massachusetts General Hospital - Development of a point of care urine tenofovir immunoassay to distinguish adherence versus resistance-based HIV treatment failure | 93.855 | | 234351 | 15,346 | - |
| Massachusetts General Hospital - Inflammation and the Vaginal Microbiome in HIV Acquisition | 93.855 | | 224082 | 4 | - |
| Massachusetts General Hospital - Novel Methods to Inform HIV/TB Clinical Trial Development | 93.855 | | 226434 | 29,897 | - |
| Massachusetts General Hospital - Optimizing HIV Care in Less Developed Countries | 93.855 | | 233034 | 54,433 | - |
| Northeastern University - A general mechanism of persister formation | 93.855 | | 500637-78050 | 364,800 | - |
| Regents of the University of California - Los Angeles - Leadership and Operation Center (LOC), AIDS Clinical Trials Group (ACTG) | 93.855 | | 1560GWB424 | 738 | - |
| Regents of the University of California - Los Angeles - Leadership and Operation Center (LOC), AIDS Clinical Trials Group (ACTG) | 93.855 | | 1560GWB425 | 101,846 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Regents of the University of California - Los Angeles - Leadership and Operations Center (LOC), AIDS Clinical Trials Group (ACTG) | 93.855 | | 1560GWB420 | 268,048 | - |
| Regents of the University of California - Los Angeles - Leadership and Operations Center (LOC), AIDS Clinical Trials Group (ACTG) | 93.855 | | 1560GWB421 | 98,769 | - |
| Regents of the University of California - Los Angeles - Leadership and Operations Center (LOC), AIDS Clinical Trials Group (ACTG) | 93.855 | | 1560GWB422 | 25,837 | - |
| Regents of the University of California - Los Angeles - Leadership and Operations Center (LOC), AIDS Clinical Trials Group (ACTG) | 93.855 | | 1560GWB423 | 2,462 | - |
| Regents of the University of California - Los Angeles - Leadership and Operations Center (LOC), AIDS Clinical Trials Group (ACTG) | 93.855 | | 1560GWB426 | 49,622 | - |
| Regents of the University of California - San Diego - Center for AIDS Research, Biostatistics and Modeling (BAM) Core | 93.855 | | 104237211 | 32,983 | - |
| Regents of the University of California - San Diego - Quantitative Methods Research Project | 93.855 | | 93420631 | 86,944 | - |
| Regents of the University of New Mexico - Stimulating protective CD4+ T cell immunity to Chlamydia trachomatis | 93.855 | | 3RT66 | (4,325) | - |
| Regents of the University of New Mexico - Stimulating protective CD4+ T cell immunity to Chlamydia trachomatis (Bryce) | 93.855 | | 3RT66 Project 2 | (402) | - |
| Stanford University - Big Data Analysis of HIV Risk and Epidemiology in Sub-Saharan Africa | 93.855 | | 61499525-123298 | 369,825 | - |
| Texas A&M Research Foundation - Structure-based Discovery of Critical Vulnerabilities of Mycobacteria | 93.855 | | M1803704 | 277,117 | - |
| The Broad Institute - Advancing Genomic Technologies to Combat Infectious Disease: Mapping Dynamics within Single Cells, Individual Hosts, and Global Populations | 93.855 | | 5000544-5500001280 | 134,547 | - |
| The Broad Institute - Advancing Genomic Technologies to Combat Infectious Disease: Mapping Dynamics within Single Cells, Individual Hosts, and Global Populations | 93.855 | | 5000545-5500001281 | 15,254 | - |
| The Broad Institute - Innovative technologies to transform antibiotic discovery | 93.855 | | 5000654-5500001346 | 40,070 | - |
| Tufts University - Single-cell factors of tuberculosis drug tolerance during adaptation to environmental stressors | 93.855 | | 103346 | 5,994 | - |
| University of California, San Diego - Automation and Evaluation of Real-Time Transmission Network-Based HIV Prevention Services in New York City | 93.855 | | 99689314 | 42,917 | - |
| University of California, San Diego - Primary Infection Resource Consortium (PIRC) | 93.855 | | 93599352 | 26,365 | - |
| University of Maryland, Baltimore - A Genomics Based Investigation of the Determinants of Polymicrobial Infectious Disease Outcomes | 93.855 | | 1400685A | 102,365 | - |
| University of Massachusetts Medical School - Systems Genetics of Tuberculosis | 93.855 | | OSP2018035 | 503,392 | - |
| University of Massachusetts Medical School - Tuberculosis and T cell recognition | 93.855 | | OSP2016182 | 87,065 | - |
| University of Miami - Immune correlates of LTBI in HIV-exposed infants | 93.855 | | SPC-001000 | 42,894 | - |
| University of Pennsylvania - NEXT GENERATION MISSING DATA METHODS IN HIV RESEARCH | 93.855 | | 574360 | 155,399 | - |
| University of Pittsburgh - Conditionally replicating BCG for alternative vaccination routes | 93.855 | | CNVA00062617 (132386-1) | 160,739 | - |
| University of Pittsburgh - Core D: Synergies among Inhibitory Receptors in Tolerance Cancer and Antiviral Immunity | 93.855 | | 9011704 (126208-1) | 27,940 | - |
| University of Pittsburgh - Influence of SIV replication on TB progression and immunity | 93.855 | | CNVA00056912 (131728-1) | 69,407 | - |
| University of Pittsburgh - Project 1: Synergies among Inhibitory Receptors in Tolerance Cancer and Antiviral Immunity | 93.855 | | CNVA00044083 (126209-1) | 402,627 | - |
| University of Pittsburgh - The Consequences of Reinfection with M. tuberculosis | 93.855 | | 0046965 (126363-1) | 173,095 | - |
| University of Washington - Assessing Mother and Infant Antiretroviral Exposure Using Hair Measures | 93.855 | | UWSC10586 | 40,930 | - |
| University of Washington - Malaria Evolution in South Asia | 93.855 | | UWSC9952 | 139,032 | - |
| Weill Medical College of Cornell University - Conditionally replicating Mycobacterium tuberculosis vaccines | 93.855 | | 17091331 | 235,508 | - |
| Wellcome Trust Sanger Institute - Large-scale systematic prioritisation of Plasmodium vivax blood stage vaccine antigens | 93.855 | | R01AI37154-SPH | 129,795 | - |
| Western University of Health Sciences - Identifying schistosomiasis resistance genes of snail vectors in hotspot transmission zones: Translating from laboratory models to the field. | 93.855 | | 20150-Steinauer-HTHCHAN | 33,085 | - |
| Yale University - Costimulatory Mechanisms of Autoimmunity (Composite) | 93.855 | | GR100959 (CON-80001032) | 504,110 | - |
| Yale University - Data and Biostatistics Core : Amazon Center of Excellence in Malaria Research | 93.855 | | 94004692 | (1,499) | - |
| Yale University - Evaluating health and economic effects of targeted strategies in TB/HIV | 93.855 | | GK000461 (CON-80000341) | 132,849 | - |
| Yale University - New Methods for the Design and Evaluation of Large HIV Prevention Interventions | 93.855 | | GR105323 (CON-80001636) | 1,124 | - |
| **Total for CFDA 93.855** | | | | 8,684,080 | 173,014 |
| Baylor College of Medicine - A Comprehensive Resource for Manipulating the Drosophila Genome | 93.859 | | 5601104954 | (35,514) | - |
| Baylor College of Medicine - A Comprehensive Resource for Manipulating the Drosophila Genome | 93.859 | | GM06785-17 | 190,918 | - |
| Brandeis University - Thermosensory integration and behavior in Drosophila larva | 93.859 | | 403758 | 350,367 | - |
| Case Western Reserve University - Changes in gut integrity markers after HIV therapy and metabolic complication | 93.859 | | RES514196 | 16,513 | - |
| Dana-Farber Cancer Institute - Preprocessing and Analysis Tools for High-Throughput Technologies | 93.859 | | 1286003 | 29,012 | - |
| Massachusetts General Hospital - Competitive Antagonists for General Anesthetics: Novel Drugs for Improving Patient Care and Advancing Scientific Research | 93.859 | | 230354 | 29,315 | - |
| Massachusetts General Hospital - Core C: Protein Chemistry | 93.859 | | 224991 | 74,502 | - |
| Massachusetts General Hospital - Project 1: Locating General Anesthetic Binding Sites in GABAA and Glycine Receptors | 93.859 | | 224993 | 62,778 | - |
| Northwestern University - Regulation and Function of Intermediate Filaments in Cell Mechanics | 93.859 | | 60051124 HU | 336,184 | - |
| Northwestern University - SCISIPBIO: Understanding and Assembling Dream Teams to Conduct Clinical and Translational Science. | 93.859 | | 60055246 HU | 8,626 | - |
| Regents of the University of Michigan - Translational frameshifting and U5-PBS:tRNALys interaction | 93.859 | | 3004633964 | 291,829 | - |
| Rensselaer Polytechnic Institute - Membrane Protein Structure Using Evolutionary Couplings and Sparse NMR Data | 93.859 | | A20-0061-S001 | 71,692 | - |
| Rockefeller University - A minimally invasive synthetic biology-driven approach for natural products discovery | 93.859 | | 5U01GM110714-05 | 383,823 | - |
| Rosalind Franklin University of Medicine and Science - Structure and function of the ATP synthase | 93.859 | | Mueller - 212159 | 12,798 | - |
| Rosalind Franklin University of Medicine and Science - Structure and mechanism of the mitochondrial ATP synthase and Batten Disease gene product, Cln3p | 93.859 | | 212160 Mueller | 89,699 | - |
| Rutgers, The State University of New Jersey - Membrane Protein Structure Using Evolutionary Couplings and Sparse NMR Data | 93.859 | | 232 | 26,531 | - |
| University of Cincinnati - Structural insight into the signaling and regulation of GDF8 and GDF11 | 93.859 | | 011843-003 | 101,270 | - |
| University of Georgia - Collaborative Research: Statistical Approaches for Deciphering the Regulatory Role of Small RNAs on Alternative Splicing | 93.859 | | SUB00001241 | 94,178 | - |
| University of Georgia Research Foundation, Inc. - Novel statistical tools for cell line specific epigenetic analysis | 93.859 | | SUB00000347 | 4,885 | - |
| University of North Carolina - Chapel Hill - Epigenetic control of metazoan transcription and pre-mRNA processing by histone PTMs | 93.859 | | 5111066 | 49,319 | - |
| University of Washington - Ribosomal DNA copy number variation as a source of missing heritability in complex traits | 93.859 | | UWSC10049 | 202,370 | - |
| Virginia Institute of Marine Science - The impacts of host vaccination and selective breeding for disease resistance on pathogen transmission and ecology in freshwater aquaculture | 93.859 | | 718792-712683 | 6,130 | - |
| **Total for CFDA 93.859** | | | | 2,397,225 | - |
| Arizona State University - Innovative Family Prevention with Latino Siblings in Disadvantaged Settings | 93.865 | | ASUB00000124 | 107,648 | - |
| Boston College - Paternal influence on children's weight outcomes | 93.865 | | 5108651-4 | 42,957 | - |
| Brigham and Women's Hospital, Inc - Causes and consequences of mitochondrial dysfunction in oocytes and cumulus cells | 93.865 | | 117986 | 440,881 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| Brigham and Women's Hospital, Inc - Mechanics of Vertebrate Embryo Elongation | 93.865 | | 119812 | 197,814 | - |
| Brigham and Women's Hospital, Inc - TRANSLATING NEW INSIGHTS FROM AXOLOTL LIMB REGENERATION INTO MICE | 93.865 | | 120755 | 58,984 | - |
| Children's Hospital Corporation - The Hippocampus and Brainstem in the Sudden Infant Death Syndrome | 93.865 | | GENFD0001660081 | 134,470 | - |
| Emory University - Spatial Uncertainty in Small Area Population Inference from Survey and Administrative Data | 93.865 | | A110121 | 126,621 | - |
| Harvard Pilgrim Health Care, Inc - A lifecourse approach to women's cardiometabolic and bone health: from fertility to perimenopause. | 93.865 | | PH000730A | 15,727 | - |
| Harvard Pilgrim Health Care, Inc - Pre- and Peri- Natal Predictors of Childhood Health and Obesity | 93.865 | | AH000630 | 21,764 | - |
| Institut de Recherche pour le Developpement - Antiviral prophylaxis and infant vaccination to prevent perinatal hepatitis B infection. | 93.865 | | 307848/01 | 16,883 | - |
| Johns Hopkins School of Public Health - Evaluating a Healthy Default Kids' Beverage Ordinance | 93.865 | | 2004546640 | 31,651 | - |
| Johns Hopkins University - Preterm Birth, Maternal and Cord Blood Metabolome, and Child Metabolic Risk | 93.865 | | 2003250340 | 104,566 | - |
| Johns Hopkins University - ''Determining Bone Loss and Bone Mineral Density Recovery following Repeat Pregnancy/Lactation among HIV Infected women on ART.'' | 93.865 | | 2004010614 | 13,713 | - |
| Johns Hopkins University - Inter-generational Link of Cardio-Metabolic Risk: Integrate Multi-OMICs with Birth Cohort | 93.865 | | 2004406421 | 92,211 | - |
| Massachusetts General Hospital - Adolescent Medicine Trials Network for HIV/AIDS Intervention (ATN) Coordinating Center | 93.865 | | 231478 | 61,235 | - |
| Massachusetts General Hospital - Improving Outcomes for HIV-infected children in South Africa and Cote d'Ivoire | 93.865 | | 224642 | 4,389 | - |
| Massachusetts General Hospital - Innovation across the spectrum of pediatric HIV care | 93.865 | | 235202 | 42,678 | - |
| Massachusetts General Hospital - Long-term Impact of Fertility Treatments (LIFT) Study | 93.865 | | 231263 | 64,768 | - |
| Michigan State University - Infertility history and chronic disease profile | 93.865 | | RC110679Harvard | 17,506 | - |
| New York University - Type, timing, and turbulence of poverty-related risk: Long-term evidence from CSRP | 93.865 | | F7479-03 | 49,483 | - |
| Regents of the University of California - Los Angeles - Impact of HIV PMTCT Interventions on HBV Disease in HIV/HBV Co-infected Women and Infants | 93.865 | | 1560GUB041 | 57,700 | - |
| Regents of the University of Michigan - Adolescent Medicine Trials Network for HIV/AIDS Interventions (ATN) Coordinating Center | 93.865 | | SUBK00011720 | 117,236 | - |
| Trustees of Boston University - HPV vaccination efficacy for cervical cancer prevention in young women with perinatal HIV infection | 93.865 | | 4500003130 | 54,575 | - |
| Tulane University - Disparities in Recovery from Hurrican Katrina: NOLA@10 | 93.865 | | TUL-HSC-557488-19/20 | 224,942 | 49,427 |
| University of Illinois at Urbana - Champaign - RNA Pol II pausing is critical for spermatogenesis and fertility | 93.865 | | 092758-17182 | 69,046 | - |
| University of Pittsburgh - Alliance for Regenerative Rehabilitation Research and Training (AR3T) -Robotic actuator for in vivo muscle stimulation | 93.865 | | CNVA0048860 (126873-16) | 67,034 | - |
| Yale University - Archiving and Documenting Health and Human Development Data Sets from | 93.865 | | GR107930(CON-80002021) | 7,810 | - |
| **Total for CFDA 93.865** | | | | 2,244,292 | 49,427 |
| Arizona State University - Identification of the genetic and transcriptomic networks of cognitive and neuropathological resilience to Alzheimer's disease associated viruses | 93.866 | | ASUB00000190 | 602,129 | - |
| Brigham and Women's Hospital, Inc - Boston OAIC: A Translational Approach to Function Promoting Anabolic Therapies | 93.866 | | 115900 | 14,251 | - |
| Brown University - Delirium, Dementia and the Vulnerable Brain: An integrated Approach (Project 4: Defining Phenotype of Complicated Delirium) | 93.866 | | 1317 | 4,145 | - |
| Brown University - Which Post Acute Care Setting is best for Patients' Outcomes | 93.866 | | 1165 | 82,157 | - |
| Hebrew Rehabilitation Center for Aged - Restricted Mean Survival Time to Interpret Clinical Trials for Treatment Decision-Making in Older Adults | 93.866 | | 90089 | 34,955 | - |
| Hebrew SeniorLife - Cerebrovascular Mechanisms of Slow Gait and Falls | 93.866 | | 10.10.90072 | (2) | - |
| Massachusetts General Hospital - Alzheimer's Disease and Related Dementia Care within the Medicare Program | 93.866 | | 233402 | 181,183 | - |
| Massachusetts General Hospital - Harnessing Diverse BioInformatic Approaches to Repurpose Drugs for Alzheimer's Disease | 93.866 | | 233405 | 228,381 | - |
| Mayo Clinic - Selective autophagy in Alzheimer's disease and related dementias | 93.866 | | HMS-256910 | 87,317 | - |
| National Bureau of Economic Research - Improving Health Outcomes for an Aging Population | 93.866 | | 4135G.30.12.HMS | 117,941 | - |
| National Bureau of Economic Research - Improving Health Outcomes for an Aging Population | 93.866 | | 4135G.30.16.HKS | 119,450 | - |
| National Bureau of Economic Research - Socioeconomic Status, Mortality, and Morbidity in Older Americans | 93.866 | | 41810.Harvard | 29,935 | - |
| Northwestern University - Proteostasis in Aging and Neurodegenerative Disease (Project 2) | 93.866 | | 60052291 HARVARD | 488,332 | - |
| Northwestern University - Proteostasis in Aging and Neurodegenerative Disease. Core C: Global Proteomics Core. | 93.866 | | 60052292 HARVARD | 160,596 | - |
| Ohio State University - Neuroimaging and Molecular Markers of AD and Neurodegenerative Disease after Concussion. | 93.866 | | 60070050 | 19,659 | - |
| Rand Corporation - Data Fusion for Long-Term Impacts | 93.866 | | 9920190049 | 14,750 | - |
| Regents of the University of California - San Francisco - Closing the gap between observational research and randomized trials for prevention of Alzheimer's Disease and dementia | 93.866 | | 11206sc | 135,085 | - |
| Regents of the University of New Mexico - Biodemography of Aging in Wild Chimpanzees | 93.866 | | 045446-87D7 | 1,643 | - |
| Rush University Medical Center - MIND Diet Intervention to Prevent Alzheimers Disease | 93.866 | | 15052004-Sub01 | 1,342,018 | - |
| Rutgers, The State University of New Jersey - Disease Outcomes iN Older adults under extreme Heat, AiR pollution and Medication use (DO-NO-HARM) | 93.866 | | 1299 | 43,207 | - |
| Stanford University - Link between epigenetic and fat metabolism | 93.866 | | 61396029-122992 | 108,587 | - |
| Syracuse University - Educational Attainment, Geography, and U.S. Adult Mortality Risk | 93.866 | | 29218-04806-S04 | 16,737 | - |
| Trustees of Dartmouth College - Causes and Consequences of Healthcare Efficiency | 93.866 | | R1341 | 38,806 | - |
| Trustees of Dartmouth College - Causes and Consequences of Healthcare Efficiency - Project 3 | 93.866 | | R1033 | 87,038 | - |
| Trustees of Dartmouth College - Causes and Consequences of Healthcare Efficiency - Project 4 | 93.866 | | R1034 | 9,640 | - |
| Tufts Medical Center - Pathogenesis of Cardiopulmonary Fibrosis Associated with Heart Failure in the Elderly | 93.866 | | 5017484-SERV | 7,887 | - |
| University of Colorado Denver - Pitavastatin to REduce Physical Function Impairment and FRailty in HIV (PREPARE) | 93.866 | | 2-5-A4588 | 24,697 | - |
| University of Massachusetts - Amherst - Development and Application of a Metabolomic Profile of Chronic Distress to Diseases of Aging | 93.866 | | 18-010151 B03 | 95,186 | - |
| University of Southern California - Dietary Restriction, GH-IGF-1 and Mechanisms of Differential Cellular Protection | 93.866 | | 101993163 | 270,817 | - |
| University of Southern California - Harmonized Diagnostic Assessment of Dementia (DAD) for Longitudinal Aging Study of India | 93.866 | | 66924119 | 22,060 | - |
| University of Wisconsin - Integrative Pathways to Health and Illness Project 1 - Psychosocial Contributors | 93.866 | | 99 | 27,624 | - |
| Van Andel Institute - Developing novel treatments for Parkinson's disease by targeting molecular pathways that have been shown to modulate aging | 93.866 | | V3015-1 | 10,357 | - |
| **Total for CFDA 93.866** | | | | 4,426,568 | - |
| Children's Hospital Corporation - Cell type-specific promoters of retinal ganglion cell survival and axonal regeneration identified through an unbiased CRISPR screen of transcriptional regulators | 93.867 | | GENFD0001639062 | 315,196 | - |
| Massachusetts Eye and Ear Infirmary - NEIGHBORHOOD Consortium for POAG Genetics | 93.867 | | 530066 | (8,272) | - |
| Northwestern University - The Mechanical Basis of Primary Open Angle Glaucoma | 93.867 | | SP0028943-PROJ0007599 | 136,484 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| University of Rochester - Accelerating vision restoration through in-vivo cellular imaging of inner and outer retina | 93.867 | | 416635-G | 90,740 | - |
| University of Rochester - CRCNS Research Proposal: Perceptual decision-making in a probabilistic inference framework | 93.867 | | 417154G/UR FAO GR510693 | 150,984 | - |
| **Total for CFDA 93.867** | | | | 685,132 | - |
| Brigham and Women's Hospital, Inc - Building capacity for chronic kidney disease research in Guatemala | 93.989 | | 117983 | 15,992 | - |
| Children's Hospital Boston - International Bioethics Research Traiing (IBRTI - Central Asia Network) | 93.989 | | GENFD0001788726 | 12,843 | - |
| College of Medicine of the University of Lagos - Building Research And Innovation in Nigeria's Science - (BRAINS) | 93.989 | | Harvard-TW010134 | 130,727 | - |
| Johns Hopkins School of Public Health - Multilevel Program and Policies to Reduce Chronic Disease for American Indians | 93.989 | | 2003231673 | 6,850 | - |
| University of Ibadan - University of Ibadan MEPI Junior Faculty Research Training Program (UI-MEPI-J) | 93.989 | | Harvard-TW010140 | 53,383 | - |
| University of Jos - Support of Training and Mentoring in Nigeria for Academics [STAMINA] | 93.989 | | UJHVD-STAMINA-Y5 | 71,655 | - |
| **Total for CFDA 93.989** | | | | 291,450 | - |
| Abt Associates, Inc. - Evaluation of the Oncology Care Model | 93.RD | | 46244 | 679,744 | - |
| Children's Hospital Boston - Adjuvant Discovery Program (DHHS Federal Contract Subcontract) | 93.RD | | GENFD0001723945 | 194,126 | - |
| Dimagi, Inc - NASCare: A mobile tool for the assessment and treatment of Neonatal Abstinence Syndrome | 93.RD | | HHSN271201700065C | 34,455 | - |
| J. Craig Venter Institute - Bioinformatics Resource Centers for Infectious Diseases - Viral | 93.RD | | JCVI-14-003 | 4,534 | - |
| Leidos Biomedical Research, Inc - Conditionally replicating strains of BCG | 93.RD | | 18X058Q1 | 57,399 | 40,964 |
| MITRE Corporation - Model Portfolio Plan (ACO Regulations) | 93.RD | | 120686 | 29,235 | - |
| Rand Corporation - Implementation of the Medicare PDP and MA Plan Disenrollment Reasons Survey | 93.RD | | 9920180022 | 84,534 | - |
| Rand Corporation - National Implementation of Medicare Advantage and Prescription Drug Plan CAHPS Surveys | 93.RD | | SCON-00000070 | 755,369 | 6,119 |
| Seven Bridges Genomics - The development and integration of advanced cyberinfrastructure, leading-edge tools, and FAIR data to accelerate discovery by the NHLBI research community | 93.RD | | No Award Number | 385,594 | - |
| Social + Scientific Systems, Inc. - A Randomized Double Blind Study Comparing Oseltamivir versus Placebo for the Treatment of Influenza in Low Risk Adults | 93.RD | | CRB-SSS-S-16-004788 | 32,260 | - |
| Social + Scientific Systems, Inc. - IRC005 - Randomized Double-Blind Phase 3 Study Comparing Efficacy and Safety of Anti-Influenza Immune Plasma | 93.RD | | CRB-SSS-S-15-004704 | 2,134 | - |
| Vanderbilt University Medical Center - Opioid Use in Nursing Homes | 93.RD | | VUMC63498 | 20,823 | - |
| Westat Corporation - NICHD International and Domestic Pediatric and Maternal HIV and Other High Priority Infectious Diseases Data Coordinating Center | 93.RD | | 6579-S42 | 140,504 | - |
| Westat Corporation - Prospective Cohort Study of HIV and Zika in Infants and Pregnancy Study (HIV-ZIPS) | 93.RD | | 6579-S42 | 254,290 | - |
| Brigham and Women's Hospital, Inc - Developing the Capability of Using National Medicaid data for FDA Post-Marketing Surveillance to Assess Medication Safety During Pregnancy | 93.RD | | 118120 | 169,463 | - |
| The Broad Institute - Human Tumor Atlas Pilot Project (HTAPP) | 93.RD | | 5101211-5500001184 | 237,211 | - |
| University of North Carolina - Chapel Hill - A Powerful And Resource-Efficient Rare Variant Meta-Analysis Workflow For Large-Scale Multi-Ethnic Sequencing Association Studies Using Summary Statistics And Functional Annotations | 93.RD | | 5116791 | 17,458 | - |
| University of North Carolina - Chapel Hill - Scalable statistical and computational methods for integrating functional data in rare variant analysis of large whole genome sequencing data | 93.RD | | 5116786 | 12,999 | - |
| **Total for 93.RD** | | | | 3,112,132 | 47,083 |
| **Total for DHHS Subaward Received** | | | | 64,222,484 | 1,457,040 |
| **Social Security Administration** | | | | | |
| National Bureau of Economic Research - Changing Labor Markets Mental Illness: Impacts on Work and Disability | 96.007 | | 51460.01:R-DRC19-05 | 51,454 | - |
| National Bureau of Economic Research - Exploration of an Alternative Disclosure Approach for SSA Statistics | 96.007 | | 51460-02:R-DRC20-12 | 28,908 | - |
| **Total for CFDA 96.007** | | | | 80,362 | - |
| **Total for Social Security Administration Subaward Received** | | | | 80,362 | - |
| **Department of Homeland Security** | | | | | |
| Rand Corporation - Puerto Rico Post-Disaster Redevelopment | 97.108 | | 9920180081 | 203 | - |
| **Total for CFDA 97.108** | | | | 203 | - |
| **Total for Department of Homeland Security Subaward Received** | | | | 203 | - |
| **Agency for International Development** | | | | | |
| International Medical Corps - Building a Better Response: Strengthening Non-governmental organization Capacity and Engagement in the International Humanitarian Architecture | 98.001 | | 103443.100.51 | 348,002 | 105,767 |
| International Rescue Committee - Safer Cash | 98.001 | | AID-OFDA-A-17-00064 | 167,727 | - |
| National Academy of Sciences - Targeting lipoprotein biogenesis in multi-drug resistant Acinetobacter baumannii for the development of new antibiotics | 98.001 | | 2000010561 | 46,540 | - |
| Tufts University - Feed the Future Innovation Lab for Collaborative Research on Nutrition - Africa | 98.001 | | AID920 | 112,519 | - |
| Yale University - Genomic, spatial, and epidemiological analysis to inform targeted TB interventions in Moldova | 98.001 | | GR104345 (CON-80001427) | 53,098 | - |
| **Total for CFDA 98.001** | | | | 727,886 | 105,767 |
| **Total for Agency for International Development Subaward Received** | | | | 727,886 | 105,767 |
| **Total for Reseach and Development Cluster Subaward Received** | | | | 90,849,896 | 1,814,766 |
| **Total for Reseach and Development Cluster** | | | | 614,592,422 | 114,850,088 |
| **Student Financial Assistance Cluster** | | | | | |
| **Direct Awards** | | | | | |
| **Department of Education** | | | | | |
| Federal Supplemental Educational Opportunity Grants (FSEOG) 2019-2020 | 84.007 | P007A191874 | | 2,988,859 | - |
| **Total for CFDA 84.007** | | | | 2,988,859 | - |
| Federal Work-Study Program (FWS) (On Campus) | 84.033 | P033A191874 | | 994,235 | - |
| Federal Work-Study Program (FWS) (Off Campus) | 84.033 | P033A191874 | | 904,243 | - |
| **Total for CFDA 84.033** | | | | 1,898,478 | - |
| Federal Pell Grant Program 2018-2019 | 84.063 | P063P180187 | | 5,660 | - |
| Federal Pell Grant Program 2019-2020 | 84.063 | P063P190187 | | 6,211,028 | - |
| **Total for CFDA 84.063** | | | | 6,216,688 | - |
| Teacher Education Assistance for College and Higher Education Grant (TEACH Grants) 2019-2020 | 84.379 | P379T200187 | | 18,820 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| **Total for CFDA 84.379** | | | | 18,820 | - |
| Federal Family Education Loans | 84.032 | | | | |
| Outstanding Loans as of July 1, 2019 | 84.032 | | | 322,354 | - |
| New Loans Issued During 2019-2020 | 84.032 | | | - | - |
| Administrative Cost Allowance | 84.032 | | | - | - |
| **Total for CFDA 84.032** | | | | 322,354 | |
| Federal Perkins Loan (FPL) - Federal Capital Contributions | 84.038 | | | | |
| Outstanding Loans as of July 1, 2019 | 84.038 | | | 36,335,098 | - |
| New Loans Issued During 2019-2020 | 84.038 | | | - | - |
| Administrative Cost Allowance | 84.038 | | | - | - |
| **Total for CFDA 84.038** | | | | 36,335,098 | |
| Federal Direct Student Loans (Direct Loan) | 84.268 | | | | |
| Federal Direct Student Loans 2018-2019 | 84.268 | | | 288,603 | - |
| Federal Direct Student Loans 2019-2020 | 84.268 | | | 82,638,536 | - |
| **Total for CFDA 84.268** | | | | 82,927,139 | - |
| **Total for Department of Education Direct Awards Student Financial Assistance** | | | | 130,707,436 | - |
| **DHHS** | | | | | |
| Health Professions Student Loans, Including Primary Care Loans/Loans for Disadvantaged Students (HPSL/PCL/LDS) | 93.342 | | | - | |
| Outstanding Loans as of July 1, 2019 | 93.342 | | | 12,361,911 | - |
| New Loans Issued During 2019-2020 | 93.342 | | | 1,266,122 | - |
| Administrative Cost Allowance | 93.342 | | | - | - |
| **Total for CFDA 93.342** | | | | 13,628,033 | - |
| **Total for DHHS Direct Awards** | | | | 13,628,033 | - |
| **Total for Direct Awards Student Financial Assistance** | | | | 144,335,469 | - |
| **Total for Student Financial Assistance Cluster** | | | | 144,335,469 | - |
| **Other Programs** | | | | | |
| **Direct Awards** | | | | | |
| **Department of Defense** | | | | | |
| Equipment for Laser Cooling and Trapping of Molecules | 12.800 | FA9550-19-1-0117 | | 331,311 | - |
| **Total for CFDA 12.800** | | | | 331,311 | - |
| Bridges to Russia: Culture and Social Studies | 12.900 | H98230-19-1-0163 | | 66,741 | - |
| **Total for CFDA 12.900** | | | | 66,741 | - |
| General and Flag Officer Homeland Security Executive Seminar and Leadership in Homeland Security Program | 12.U01 | W912SV19C0004 | | 169,338 | - |
| **Total for 12.U01** | | | | 169,338 | - |
| **Total for Department of Defense Direct Awards Other Programs** | | | | 567,390 | - |
| **Department of Justice** | | | | | |
| Applying a Development Evaluation Approach to Address Community Safety and Health Challenges of Reintegration Programs in the USA | 16.560 | 2019-ZA-CX-0001 | | 15,963 | - |
| **Total for CFDA 16.560** | | | | 15,963 | - |
| **Total for Department of Justice Direct Awards Other Programs** | | | | 15,963 | - |
| **Department of State** | | | | | |
| Crossroad of Empires: From the Monumental Lydian Gate to the Roman Road and Mosaics at Sardis | 19.040 | S-TU-150-17-GR-051 | | 27,831 | - |
| **Total for CFDA 19.040** | | | | 27,831 | - |
| Disability Civil Society, Human Rights, and Law in China | 19.345 | S-LMAQM-17-GR-1102 | | 304,952 | - |
| **Total for CFDA 19.345** | | | | 304,952 | - |
| **Total for Department of State Direct Awards Other Programs** | | | | 332,783 | - |
| **Department of Transportation** | | | | | |
| Dwight David Eisenhower Transportation Fellowship | 20.215 | 693JJ31945089 | | 5 | - |
| Dwight David Eisenhower Transportation Fellowship Program (DDETFP) Graduate Fellowship | 20.215 | 693JJ32045028 | | 10,001 | - |
| **Total for CFDA 20.215** | | | | 10,006 | - |
| **Total for Department of Transportation Direct Awards Other Programs** | | | | 10,006 | - |
| **Department of the Treasury** | | | | | |
| Low Income Taxpayers Clinic | 21.008 | 20-LITC0393-02-00 | | 65,083 | - |
| Low Income Taxpayers Clinic | 21.008 | 20-LITC0393-02-00 | | 49,688 | - |
| **Total for CFDA 21.008** | | | | 114,771 | - |
| **Total for Department of the Treasury Direct Awards Other Programs** | | | | 114,771 | - |
| **NASA** | | | | | |
| The 9th International GEOS-Chem Meeting (IGC9) | 43.001 | 80NSSC19K0410 | | 12,929 | - |
| **Total for CFDA 43.001** | | | | 12,929 | - |
| **Total for NASA Direct Awards Other Programs** | | | | 12,929 | - |
| **Institute of Museum and Library Services** | | | | | |
| Next generation sample curation of a Historic Meteorite Collection | 45.301 | MA-30-19-0516-19 | | 50,386 | - |
| Opening Up Digital Collections: Learning Resources for Middle School | 45.301 | MA-10-18-0311-18 | | 52,344 | - |
| Reimagining, reinvigorating and conserving the Earth Archive in a digital age | 45.301 | MA-30-18-0310-18 | | 55,610 | - |
| **Total for CFDA 45.301** | | | | 158,340 | - |
| Building for Tomorrow: Collaborative Development of Sustainable Infrastructure for Architectural and Design Documentation | 45.312 | LG-73-17-0004-17 | | 161 | - |
| Scaling Up Perma. cc: Ensuring the Integrity of the Digital Scholarly Record | 45.312 | LG-70-16-0023-16 | | 90,783 | - |
| **Total for CFDA 45.312** | | | | 90,944 | - |
| Planning Grant: Young Changemakers in the 21st Century Library | 45.313 | RE-97-18-0063-18 | | 15,450 | - |
| **Total for CFDA 45.313** | | | | 15,450 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| **Total for Institute of Museum and Library Services Direct Awards Other Programs** | | | | 264,734 | - |
| **National Endowment for the Humanities** | | | | | |
| Digital Giza | 45.164 | MN-258709-18 | | 48,953 | 7,720 |
| **Total for CFDA 45.164** | | | | 48,953 | 7,720 |
| Imperiia: An Information Ecosystem for Russian History | 45.169 | HAA-266553-19 | | 36,113 | - |
| **Total for CFDA 45.169** | | | | 36,113 | - |
| Bogoraz's Itelmen Notebooks | 47.075 | PD-260979-18 | | 13,597 | - |
| **Total for CFDA 47.075** | | | | 13,597 | - |
| **Total for National Endowment for the Humanities Direct Awards Other Programs** | | | | 98,663 | 7,720 |
| **Department of Energy** | | | | | |
| IC Fellowship (Loren Alegria) Research Advisor Stipend, Travel, and Lab Allowance | 81.000 | No Award Number | | 28,734 | - |
| **Total for CFDA 81.000** | | | | 28,734 | - |
| **Total for Department of Energy Direct Awards Other Programs** | | | | 28,734 | - |
| **Department of Education** | | | | | |
| National Resource Centers: Center for African Studies | 84.015A | P015A180138 | | 225,170 | - |
| National Resource Centers: Davis Center for Russian and Eurasian Studies | 84.015A | P015A180078 | | 231,265 | - |
| **Total for CFDA 84.015A** | | | | 456,435 | - |
| Foreign Language and Area Studies (FLAS): Davis Center for Russian and Eurasian Studies | 84.015B | P015B180078 | | 367,500 | - |
| Foreign Languages and Area Studies (FLAS) - Center for African Studies | 84.015B | P015B180138 - 19 | | 236,084 | - |
| **Total for CFDA 84.015B** | | | | 603,584 | - |
| Fulbright-Hays Doctoral Dissertation Research Abroad | 84.022A | P022A180031 | | 1,000 | - |
| Fulbright-Hays Doctoral Dissertation Research Abroad | 84.022A | P022A190019 - 19A | | 133,128 | - |
| **Total for CFDA 84.022A** | | | | 134,128 | - |
| The Strategic Data Project for Higher Education— Using Data to Improve Retention and Workforce Outcomes | 84.305U | R305U190001 | | 196,539 | 39,279 |
| **Total for CFDA 84.305U** | | | | 196,539 | 39,279 |
| **Total for Department of Education Direct Awards Other Programs** | | | | 1,390,686 | 39,279 |
| **Delta Regional Authority** | | | | | |
| Authentic Leadership: Delta Leadership Institute | 90.U01 | No Award Number | | 146,356 | - |
| **Total for 90.U01** | | | | 146,356 | - |
| **Total for Delta Regional Authority Direct Awards Other Programs** | | | | 146,356 | - |
| **DHHS** | | | | | |
| Prevention Policy Modeling Lab | 93.084 | 6NU38PS004644-05-04 | | 708,412 | 406,507 |
| **Total for CFDA 93.084** | | | | 708,412 | 406,507 |
| Equitable Care For Elders | 93.129 | 6 U30CS307880301 | | 533,554 | - |
| **Total for CFDA 93.129** | | | | 533,554 | - |
| **Total for DHHS Direct Awards Other Programs** | | | | 1,241,966 | 406,507 |
| **Department of Homeland Security** | | | | | |
| Evaluation of the Greater Boston Countering Violent Extremism (CVE) Pilot Program | 97.108 | 15STFRG00005-01-01 | | 273,798 | - |
| **Total for CFDA 97.108** | | | | 273,798 | - |
| **Total for Department of Homeland Security Direct Awards Other Programs** | | | | 273,798 | - |
| **Other Programs Direct Direct Awards Total** | | | | 4,498,779 | 453,506 |
| **Other Programs** | | | | | |
| **Subaward Received** | | | | | |
| **Department of Defense** | | | | | |
| Griffiss Institute - Embedded Deep Learning: Algorithms and Architectures for Efficient CNN Inference | 12.U02 | | SA2018-UP-026 | 30,866 | - |
| **Total for CFDA 12.U02** | | | | 30,866 | - |
| **Total for Department of Defense Subaward Received Other Programs** | | | | 30,866 | - |
| **Department of Housing & Urban Development** | | | | | |
| Neighborhood Reinvestment Corporation - Achieving Excellence in Community Development | 14.U01 | | No Award Number | 221,288 | - |
| **Total for CFDA 14.U01** | | | | 221,288 | - |
| Neighborhood Reinvestment Corporation - THE EDWARD M. GRAMLICH FELLOWSHIP IN COMMUNITY AND ECONOMIC DEVELOPMENT SUMMER FELLOWSHIP PROGRAM - Summer 2019 | 14.U02 | | OSPNEG-7289 | 23,500 | - |
| **Total for CFDA 14.U02** | | | | 23,500 | - |
| Neighborhood Reinvestment Corporation - THE EDWARD M. GRAMLICH FELLOWSHIP IN COMMUNITY AND ECONOMIC DEVELOPMENT SUMMER FELLOWSHIP PROGRAM - Summer 2020 | 14.U03 | | No Award Number | 10,000 | - |
| **Total for CFDA 14.U03** | | | | 10,000 | - |
| **Total for Department of Housing & Urban Development Subaward Received Other Programs** | | | | 254,788 | - |
| **Department of Justice** | | | | | |
| University of Massachusetts - Lowell - Research and Evaluation on Prevention and Mitigation of Domestic Pathways to Terrorism | 16.560 | | S51000000040709 | 82,092 | - |
| **Total for CFDA 16.560** | | | | 82,092 | - |
| **Total for Department of Justice Subaward Received Other Programs** | | | | 82,092 | - |
| **Department of State** | | | | | |
| Trust for University Innovation in Vietnam - Development for Fulbright University Vietnam | 19.451 | | 100004-0076-1 | 617,697 | - |
| **Total for CFDA 19.451** | | | | 617,697 | - |
| **Total for Department of State Subaward Received Other Programs** | | | | 617,697 | - |
| **NASA** | | | | | |
| Trustees of Boston University - Calibration and Validation of XCO2 and SIF for Urban Targets | 43.001 | | 4500003143 | 134,495 | - |
| **Total for CFDA 43.001** | | | | 134,495 | - |

**Harvard University**
**Schedule of Expenditures of Federal Awards**
**Year Ended June 30, 2020**

| Federal Grantor/Pass-through Grantor/Program or Cluster Title | CFDA Number | Award Number | Pass-through Entity Identification Number | Federal Expenditures | Passed to Sub-Recipients |
|---|---|---|---|---|---|
| **Total for NASA Subaward Received Other Programs** | | | | 134,495 | - |
| **Department of Energy** | | | | | |
| Krell Institute - Krell Institute DOE Computational Science Graduate Fellowship | 81.049 | | No Award Number | 6,683 | - |
| **Total for CFDA 81.049** | | | | 6,683 | - |
| Brookhaven National Laboratory - ATLAS Pixel dE/dx Analysis and ITk Serial Powering at Lawrence Berkeley National Lab | 81.U01 | | 366575 | 5,922 | - |
| **Total for CFDA 81.U01** | | | | 5,922 | - |
| **Total for Department of Energy Subaward Received Other Programs** | | | | 12,605 | - |
| **Department of Education** | | | | | |
| United Way Massachusetts Bay, Inc. (UWMB) - BoSTEM Initiative with MEDscience | 84.411C | | No Award Number | 26,832 | - |
| **Total for CFDA 84.411C** | | | | 26,832 | - |
| **Total for Department of Education Subaward Received Other Programs** | | | | 26,832 | - |
| **DHHS** | | | | | |
| AIDS Prevention Initiative in Nigeria, Ltd/Gte. - Engaging Indigenous Organizations to Sustain and Enhance Comprehensive Clinical Services for the Prevention, Care and Treatment of HIV/AIDS in Nigeria under PEPFAR | 93.067 | | HSPH-GH002098 | 304,710 | - |
| **Total for CFDA 93.067** | | | | 304,710 | - |
| COVID-19 - Association of State and Territorial Health Officials - Polls to Support COVID-19 Response Communications: Technical Assistance for State, Territorial, and Federal (STF) Communication during Public Health Emergencies | 93.421 | | 81-FE-2700-01-00 | 23,609 | - |
| **Total for CFDA 93.421** | | | | 23,609 | - |
| Trustees of Boston University - Improving HIV Health Outcomes through the Coordination of Supportive Employment and Housing Services | 93.928 | | 4500002839 | 6,188 | - |
| **Total for CFDA 93.928** | | | | 6,188 | - |
| Commonwealth of Massachusetts/Center for Health Information and Analysis - MDPH Health and Medical Coalition Exercise Program | 93.U01 | | INTF6208HH4183222192 | 3,482 | - |
| **Total for CFDA 93.U01** | | | | 3,482 | - |
| **Total for DHHS Subaward Received Other Programs** | | | | 337,989 | - |
| **Agency for International Development** | | | | | |
| Concern Worldwide U.S. Inc - Humanitarian Leadership Program: Developing the Next Generation of Humanitarian Leaders | 98.001 | | BBE-HVD-001 | 155,470 | - |
| Concern Worldwide U.S. Inc - Humanitarian Leadership Program: Developing the Next Generation of Humanitarian Leaders | 98.001 | | NNPHL2-HHI-001 | 125,791 | - |
| **Total for CFDA 98.001** | | | | 281,261 | - |
| **Total for Agency for International Development Subaward Received Other Programs** | | | | 281,261 | - |
| **Total for Subaward Received Other Programs** | | | | 1,778,625 | - |
| **Total for Other Programs** | | | | 6,277,404 | 453,506 |
| **Total Expenditures of Federal Awards** | | | | **$ 765,205,295** | **$ 115,303,594** |

# Harvard University
## Notes to Schedule of Expenditures of Federal Awards Year Ended June 30, 2020

### 1. Basis of Presentation and Summary of Significant Accounting Policies

The accompanying Schedule of Expenditures of Federal Awards (the "Schedule") summarizes the expenditures of Harvard University (the "University") under programs of the federal government for the year ended June 30, 2020. The information in this Schedule is presented in accordance with the Title 2 U.S. *Code of Federal Regulations Part 200, Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards* (Uniform Guidance). Therefore, some amounts presented in this schedule may differ from amounts presented in, or used in the preparation of, the basic financial statements of the University. Negative amounts represent adjustments or credits to amounts reported as expenditures in prior years in the normal course of business. CFDA numbers and pass-through numbers are provided when available.

For purposes of the Schedule, Federal awards include all grants, contracts and similar agreements entered into directly between the University and agencies and departments of the Federal government and all subawards to the University by nonfederal or organizations pursuant to Federal grants, contracts and similar agreements.

The term "Revised" accompanying the award numbers on the Schedule represents a revised Notice of Grant Award (NGA).

Expenditures reported in the Schedule are reported on the accrual basis of accounting. Such expenditures are recognized following the cost principles contained in the Uniform Guidance and OMB Circular A-21, *Cost Principles for Educational Institutions*, as applicable, wherein certain types of expenditures are not allowable or are limited to reimbursement.

### 2. Facilities and Administrative Costs

The University 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 the Uniform Guidance. The University recovers facilities and administrative costs associated with sponsored agreements pursuant to separate arrangements negotiated with the University's Federal cognizant agency by each of the Medical School, School of Public Health, and the University Area. Predetermined facilities and administrative rates have been established for the University Area and Medical School (including the School of Dental Medicine) through June 30, 2024. The School of Public Health has predetermined rates through June 30, 2023.

### 3. Federal Student Loan Programs

The Federal student loan programs listed below are administered directly by the University and balances and transactions relating to these programs are included in the University's consolidated financial statements. Loans outstanding at the beginning of the year, the administrative cost allowance and loans made during the year are included in the federal expenditures presented in the Schedule. The balance of loans outstanding at June 30, 2020 consist of:

| | CFDA #: | | Amount |
|---|---|---|---|
| Perkins | 84.038 | $ | 26,809,075 |
| FFEL (includes FISL Sub Stafford, Unsub Stafford, PLUS and SLS | 84.032L | | - |
| HPSL/LDS/PCL | 93.342 | | 12,197,355 |
| **Total Federal Student Loans** | | **$** | **39,006,430** |

# Harvard University
## Notes to Schedule of Expenditures of Federal Awards Year Ended June 30, 2020

The University participated in the School as Lender program (CFDA# 84.032L) beginning in 1977 until the program ended in June 2010. There were no new loans distributed to students in connection with this program during the year ended June 30, 2020.

Loans made by the University to eligible students under the Federal student loan programs and Federally guaranteed loans issued to students during the year ended June 30, 2020 are summarized as follows:

| | CFDA # | Amount |
|---|---|---|
| Perkins | 84.038 | $ - |
| Net Direct Subsidized Stafford | 84.268 | 1,299,755 |
| Net Direct Unsubsidized Stafford | 84.268 | 48,806,328 |
| Net Direct PLUS | 84.268 | 3,345,104 |
| Net Direct Grad PLUS | 84.268 | 29,475,952 |
| HPSL/LDS/PCL | 93.342 | 1,266,122 |
| **Total** | | **$ 84,193,261** |

# Part II
# Reports on 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 Joint Committee on Inspection of the Governing Boards of Harvard 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 Harvard University and its subsidiaries which comprise the consolidated balance sheet as of June 30, 2020 and the related consolidated statements of changes in net assets with general operating account detail, changes in net assets of the endowment and of cash flows for the year then ended, and the related notes to the financial statements and have issued our report thereon dated October 22, 2020, which included an emphasis of matter paragraph related to the University changing the manner in which it accounts for restricted cash and certain other cash balances within the statements of cash flows and the manner in which it accounts for leases in 2020 as discussed on Note 2.

**Internal Control Over Financial Reporting**

In planning and performing our audit of the financial statements, we considered the University's internal control over financial reporting ("internal control") as a basis for designing 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 the University's internal control. Accordingly, we do not express an opinion on the effectiveness of the '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 the University'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 financial statements. 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

Boston, Massachusetts
October 22, 2020

**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 Joint Committee on Inspection of the Governing Boards of Harvard University:

**Report on Compliance for Each Major Federal Program**

We have audited Harvard University's (the "University") compliance with the types of compliance requirements described in the *OMB Compliance Supplement* that could have a direct and material effect on each of the University's major federal programs for the year ended June 30, 2020. The University's major federal programs are 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 the University'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 the University'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 the University's compliance.

***Opinion on Each Major Federal Program***

In our opinion, the 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 June 30, 2020.

***Other Matters***

As indicated in Part I to the accompanying Schedule of Findings and Questioned Costs, we have audited the Student Financial Assistance cluster as a major program. Also, as indicated in the first paragraph of this report, we performed our audit of compliance using the compliance requirements contained in the OMB Compliance Supplement, including those contained in Part V 5.3, Compliance Requirement N, Special Tests and Provisions, Section 10 "Gramm-Leach-Bliley Act-Student Information Security." This section includes three suggested audit procedures with respect to verification that the institution (1) designated an individual to coordinate the information security program, (2) performed a risk assessment that addresses the three required areas in 16 CFR 314.4(b), and (3) documented a safeguard for each risk identified. Our procedures in relation to these three items were limited to inquiry of and obtaining written representation from management and obtaining and reading management's documentation related to these three items. Our procedures did not include an analysis of the adequacy or completeness of the risk assessment performed or the safeguards for each risk identified by management.

The results of our auditing procedures disclosed instances of noncompliance, which are required to be reported in accordance with the Uniform Guidance and which are described in the accompanying schedule of findings and questioned costs as items 2020-001, 2020-002, and 2020-003. Our opinion on each major federal program is not modified with respect to these matters.

The University's response to the noncompliance findings identified in our audit is described in the accompanying schedule of findings and questioned costs and corrective action plan. The University's response was not subjected to the auditing procedures applied in the audit of compliance and, accordingly, we express no opinion on the response.

**Report on Internal Control Over Compliance**

Management of the University 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 the University'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 the University'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

Boston, Massachusetts
June 30, 2021

# Part III
# Audit Findings and Questioned Costs

# Harvard University
## Schedule of Findings and Questioned Costs
## Year Ended June 30, 2020

**I. Summary of Auditors' Results**

**Financial statements**

| | |
|---|---|
| Type of audit report issued | Unmodified opinion |
| Internal control over financial reporting: | |
| ▪ Material weaknesses identified? | No |
| ▪ Significant deficiency(ies) identified that are not considered to be material weaknesses? | None reported |
| ▪ Noncompliance which is material to the financial statements noted? | No |

**Federal awards**

| | |
|---|---|
| Internal control over major programs: | |
| ▪ Material weaknesses 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 student financial assistance programs: | Unmodified opinion |
| Any audit findings disclosed that are required to be reported in accordance with 2 CFR 200.516(a)? | Yes |

**Identification of major programs**

| CFDA Number | Name of Federal Program or Cluster |
|---|---|
| Various | Research and Development Cluster |
| Various | Student Financial Assistance Cluster |

| | |
|---|---|
| Dollar threshold to distinguish between Type A and Type B programs | $ 3,000,000 |
| Auditee qualifies as a low-risk auditee? | Yes |

**II. Financial Statement Findings**

None noted.

### 2020-001 E-Sign Act

**Cluster:** Student Financial Assistance
**Grantor:** Department of Education
**Award Name:** Federal Work Study Program, Federal Direct Student Loans
**Award Year:** FY2020
**CFDA Numbers:** 84.033, 84.268

**Criteria**
*The Electronic Signatures in Global and National Commerce Act* ("E-Sign Act") states that a school must obtain a student's voluntary consent to participate in electronic transactions.

**Condition**
In examining 170 student records across six schools, we noted that the University requires each student annually agree to certain terms and conditions before they accept federal student assistance. A statement prompting the student to voluntarily consent to participate in electronic transactions was not included in the list of terms and conditions for 25 student records inspected (all within Harvard Law School).

**Cause**
Harvard Law School inadvertently omitted the statement prompting students to voluntarily consent to participate in electronic transactions from the list of terms and conditions each student is required to accept.

**Effect**
A lack of student consent to participate in electronic transactions may result in the transactions being denied legal effect, validity, or enforceability solely because it was not in electronic form or because an electronic signature or electronic record was not used in its formation.

**Questioned Costs**
None noted.

**Recommendation**
We recommend Harvard Law School add a statement that the student voluntarily consents to participating in electronic transactions to the list of terms and conditions annually agreed to by students receiving federal student financial assistance.

**Management's Views and Corrective Action Plan**
Management's views and corrective action plan are included at the end of this report after the summary of status of prior audit findings.

### 2020-002 Data Borrower Transmission - Direct Loan Reconciliations

**Cluster:** Student Financial Assistance
**Grantor:** Department of Education
**Award Name:** Federal Direct Student Loans
**Award Year:** FY2020
**CFDA Numbers:** 84.268

**Criteria**
The Direct Loan reconciliation is a mandatory monthly process, as required under 34 CFR 685.300(b)(5). A School should reconcile all disbursement records (actual disbursements and adjustments) to the information in the Common Origination and Disbursement (COD) System on an ongoing monthly basis.

**Condition**
In examining 18 monthly reconciliation records across six schools, we noted that three reconciliations at one school within the University did not perform reconciliations of internal disbursement records to the Common Origination and Disbursement System within the first five months of the fiscal year. These were completed for the subsequent seven months.

**Cause**
As there was turnover and no formal documentation of procedures to be performed by employees, University staff at Harvard Law School did not perform the required reconciliations.

**Effect**
The school examined may inappropriately disburse funds and be unable to identify such errors throughout the year.

**Questioned Costs**
None noted.

**Recommendation**
We recommend Harvard Law School educate their program staff on the formal policies in place to perform and maintain Direct Loan reconciliations to ensure the appropriate Direct Loan requirements are met throughout the year and create a monthly close checklist to ensure required procedures are not omitted.

**Management's Views and Corrective Action Plan**
Management's views and corrective action plan is included at the end of this report after the summary schedule of prior audit findings and status.

**2020-003 Participant Support Costs**

**Cluster:** Research and Development
**Grantor:** National Science Foundation
**Award Name:** BD Spokes: SPOKE: NORTHEAST: Collaborative Research: Integration of environmental factors and causal reasoning approaches for large-scale observational health research
**Award Number:** IIS-1636870
**Award Year:** FY2020
**CFDA Title:** Computer and Information Science and Engineering
**CFDA Number:** 47.070

**Criteria**
The National Science Foundation's ("NSF") Office of Budget Finance and Award Management ("BFA") defines participant support costs. Participant support costs are direct costs for items such as stipends or subsistence allowances, travel allowances and registration fees paid to or on behalf of participants or trainees (but not employees) in connection with meetings, conferences, symposia or training projects. Funds provided for participant support may not be used by grantees for other categories of expense without the specific prior written approval of the cognizant NSF Program Officer. Therefore, awardee organizations must account for participant support costs separately. Participant support allowances may not be paid to trainees who are receiving compensation, either directly or indirectly, from other Federal government sources while participating in the project. A non-NSF Federal employee may receive participant support allowances from grant funds provided there is no duplication of funding of items and provided no single item of participant cost is divided between his/her parent agency and NSF grant funds.

**Condition**
We selected 65 R&D direct cost selections for testing, totaling $539,682 and identified two selections, totaling $4,000, which included unallowable costs. The University further investigated the unallowable costs noting the total amount inappropriately expended on the award was $25,798. The University, specifically Harvard Medical School, used participant support costs to cover stipends, salaries, and wages and did not obtain written approval from the NSF Program Officer prior to rebudgeting the use of these funds. The University is reviewing all NSF awards with participant support costs.

**Cause**
Harvard Medical School did not have a full understanding of how NSF participant support costs are required to be used on this award. The department believed that charging stipends and salary to the participant support costs category was appropriate since these types of payments did directly support the project.

**Effect**
Lack of understanding the detailed terms and conditions of the award, specifically, the definition of NSF participant support costs, resulted in unallowable costs being charged to the award.

**Questioned Costs**
$25,798

**Recommendation**
We recommend Harvard Medical School provide enhanced training to its department staff around the appropriate use of NSF participant support costs and recommend that the Office of Research Administration ("ORA") and Office of Sponsored Programs ("OSP") continue their detailed review of NSF awards to ensure compliance with participant support cost requirements (including that awards are appropriately set up in the system for participant support cost expenditure 'strings'). Additionally, we recommend that the University return $25,798 to NSF.

**Management's Views and Corrective Action Plan**
Management's views and corrective action plan are included at the end of this report after the summary of status of prior audit findings.

# Harvard University
## Summary of Status of Prior Audit Findings
## Year Ended June 30, 2020

There are no findings from prior years that require an update in this report.

**Harvard University**
**Management's Corrective Action Plan**
**Year Ended June 30, 2020**

**2020-001 E-Sign Act**

During the 2019-2020 academic year, the Law School Financial Aid office was transitioning to a new document collection system, and the voluntary consent to participate in electronic services was added to its institutional financial aid application. During the transition, all students for the 2020-2021 academic year were presented with the consent form, but students enrolled during the 2019-2020 academic year, and prior, did not receive the consent form as they had already applied for aid. The Law School acknowledges this oversight, and effective February 11, 2020 has obtained the consent form for all students who applied for financial aid after February 11, 2020. Financial aid applicants are now presented with the consent form when they first log in to the HLS SFS Self-Service Portal, the student interface to Salesforce.

Primary responsibility for implementing the Corrective Action Plan for this finding rests with Natasha Onken, HLS Assistant Dean for Student Financial Services, 617.496.3369.

**2020-002 Data Borrower Transmission - Direct Loan Reconciliations**

The Law School acknowledges that during a time of significant staff turnover this monthly reconciliation was inadvertently not performed during July 2019-November 2019. The reconciliation was performed prior to, and following, that period. We have implemented additional calendar reminders across several staff members regarding this process and have performed the reconciliation timely since December 2019 on a monthly basis.

As a result of this audit finding, the University Financial Aid Liaison Office ("UFALO") provided training to all Harvard Financial Aid offices in November 2020 to ensure that staff are aware of their reconciliation obligations and understand how to perform them. UFALO has also provided each Financial Aid office with guidance on keeping their Policies & Procedures Manuals current, including a section on 'Administrative and Fiscal Controls'.

Primary responsibility for implementing the Corrective Action Plan for this finding rests with Natasha Onken, HLS Assistant Dean for Student Financial Services, 617.496.3369.

Sincerely,

Amanda McDonnell

Amanda McDonnell
University Controller
617.495.8032

Office of the Controller
1033 Massachusetts Avenue, 3rd Floor Cambridge, MA 02138
T 617 495 4532 F 617 495 1937

**Harvard University**
**Management's Corrective Action Plan**
**Year Ended June 30, 2020**

**2020-003 Participant Support Costs**

During the 2020 fiscal year, Harvard Medical School had a National Science Foundation (NSF) award in which participant support costs was awarded and the school neglected to seek prior approval to re-budget those costs into other budget categories prior to expending the funds. The Office for Sponsored Programs (OSP) acknowledges this oversight. Contributing to this oversight were inconsistencies in identification of participant support costs in the system of record and lack of focused training on participant support costs. These items were identified prior to this audit finding. Participant support costs are the focus of a new university-wide committee, established in May 2021, devoted to the development of Participant Support Costs Procedures and to ensuring that targeted training is developed and available.

As a result of this audit finding, a scrub of FY20 and FY21 NSF participant support costs at Harvard Medical School is in progress to ensure that prior approvals for re-budgeting participant support costs were obtained on all other awards. The Manager of Training and Compliance in OSP will continue leading the effort, with the Participant Support Costs committee, to develop procedures for research administrators to identify participant support costs in the grants management system (GMAS). As a co-chair of the University Research Administration Training Team (URATT), the Manager of Training and Compliance will work with representatives from across the university to develop a participant support costs training for all recipients of awards that have participant support costs budgeted in the notification of award. Additionally, participant support costs will be added to the OSP monitoring program, also managed by the Manager of Training and Compliance. The monitoring will serve to identify participant support costs through GMAS, review expenditures, and thereby provide assurance that training and tracking of participant support costs is sufficient.

We estimate that full implementation of this corrective action plan will take until June 30, 2022, 1 year from discovery of this finding.

Responsibility for implementing the Corrective Action Plan for this finding rests with Christyne Anderson, Manager of Training and Compliance in the Office for Sponsored Programs, 617.496.5635 in partnership with the Office of Research Administration at Harvard Medical School.

Sincerely,

DocuSigned by:
Sarah T. Axelrod
5E964245E5034E3...

Sarah T. Axelrod
Assistant Vice President, Office for Sponsored Programs
sarah_axelrod@harvard.edu
617.496.2513