# UNIVERSITY OF MASSACHUSETTS
# FY 2017
# RESEARCH AND DEVELOPMENT EXPENDITURES REPORT

*UNIVERSITY OF MASSACHUSETTS PRESIDENT'S OFFICE*
*OFFICE OF INSTITUTIONAL RESEARCH*
*FEBRUARY 2018*

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## TOTAL R&D EXPENDITURES – UMASS SYSTEM AND CAMPUSES



## LIFE SCIENCES R&D EXPENDITURES

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# Introduction

The *FY 2017 Annual Research and Development Expenditures Report* presents information on the research and development expenditures for the University of Massachusetts System. This report is based on data that our five UMass campuses and the UMass President's Office provide to the National Science Foundation (NSF) through its Higher Education Research and Development Survey (previously known as the annual Survey of Research and Development Expenditures at Universities and Colleges). In addition to the FY 2017 data, this report also provides trend data in many cases. All comparison data presented in this report are sourced from the NSF HERD Data tables. These tables can be found at http://ncsesdata.nsf.gov/herd/2016/.

**Major Highlights:**

- **UMASS Total R&D Expenditures** – Total FY 2017 R&D Expenditures for the University of Massachusetts System was at $670.0 million, which represents a 5.9 percent increase from the FY 2016 total of $632.4 million.

- **Growth in Total R&D Expenditures (UMASS versus All U.S. Institutions)** – In FY 2016 (most recent comparison data available), while Total R&D Expenditures for the UMASS system reflected a 0.6 percent increase over the previous year, All U.S. Institutions reflected a growth rate of 4.8 percent.

- **UMASS R&D Expenditures in Science and Engineering** – In FY 2017, an estimated $609.3 million (91 percent) of our R&D expenditures were in sciences and engineering (S&E).

- **UMASS State Ranking in Total R&D Expenditures** – Among Massachusetts' colleges and universities, UMASS ranked 3rd in Total R&D Expenditures, behind only MIT and Harvard. In FY 2016, UMASS comprised nearly 14.3 percent of the Total Expenditures of all MA institutions. UMASS, MIT, Harvard and BU together account for 81 percent of the academic science and engineering R&D expenditures in the state (Rankings based on FY 2016 data).

- **UMASS R&D Expenditures by Funding Source (FY 2017)** – In terms of funding sources, 56 percent is from the federal government, 27 percent is from institutional sources, 7 percent is from state and local government, 4 percent from businesses, 5 percent from non-profit organizations, and 1 percent is from other sources (e.g., private foundations).

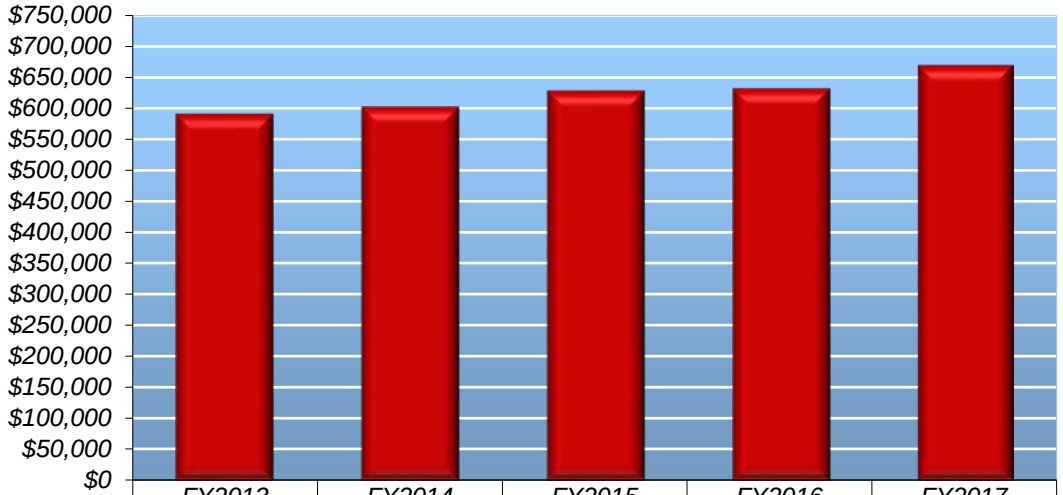
- **UMASS Areas of Funding Growth** – Between the reporting cycles FY 2016-17, industry/business sponsorship remained steady at 9 percent. Institutional funds also remained the same at 27 percent. State and local government funding increased by one percent, from 6 percent to 7 percent of all funds. Federal funding stayed the same at 56 percent of all funds.

- **Life Sciences Continues to Comprise More Than Half of all R&D Expenditures at UMASS** – At $391.6 million, the life sciences constitute more than half of UMASS's total R&D expenditures (58.4 percent). FY 2017 distribution of R&D expenditures by field is:

| | | | |
|---|---|---|---|
| Life Sciences | 58.4% | Social Sciences | 3.3% |
| Physical Sciences | 5.8% | Non-Science and Engineering | 9.1% |
| Engineering | 12.4% | Psychology | 2.0% |
| Computer Sciences | 4.6% | Mathematical Sciences | 1.6% |
| Geo/Atm./Oceanic Sc. | 3.3% | Other Sciences | 0.9% |

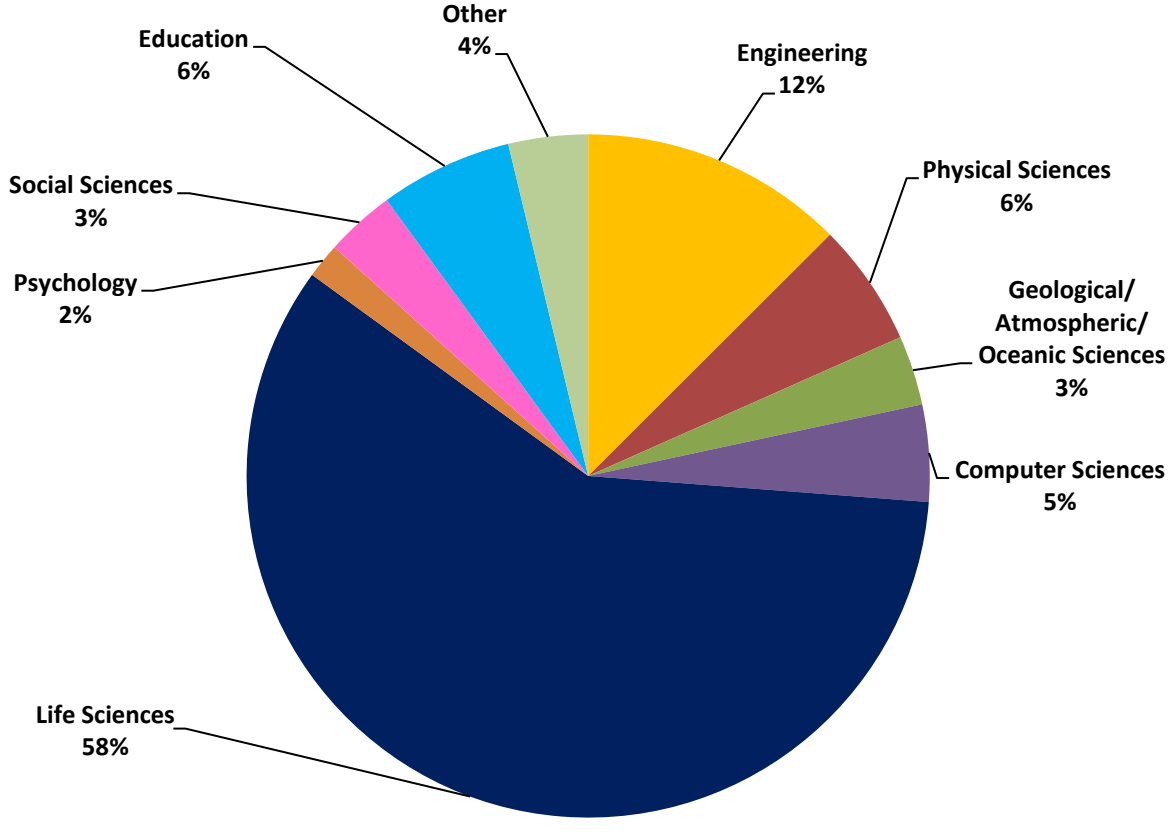
# UMASS System

## Total R&D Expenditures FY 2013 - FY 2017



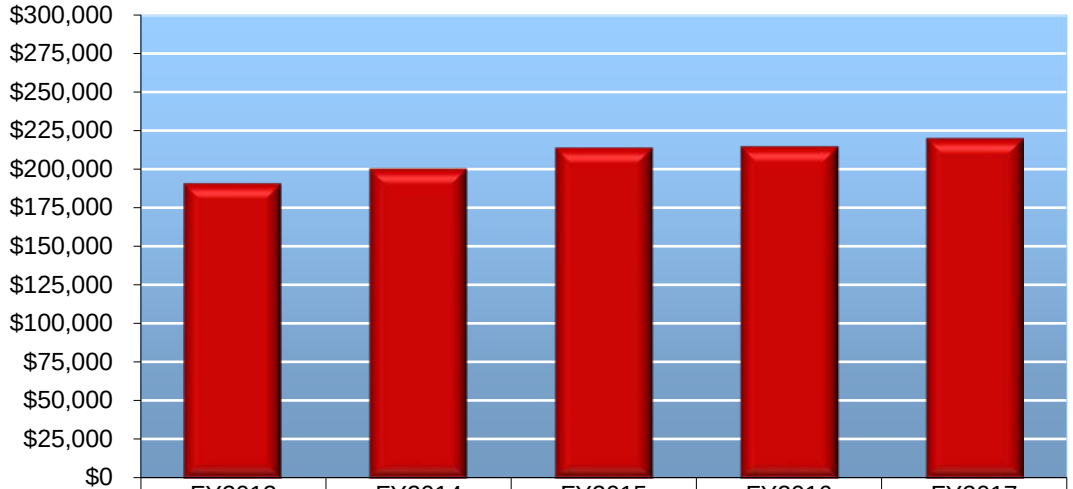

| | FY2013 | FY2014 | FY2015 | FY2016 | FY2017 |
|---|---|---|---|---|---|
| Total R&D ($000s) | $591,121 | $603,010 | $628,798 | $632,435 | $669,993 |
| Annual Growth | -1.1% | 2.0% | 4.3% | 0.6% | 5.9% |

## Total R&D Expenditures FY 2017



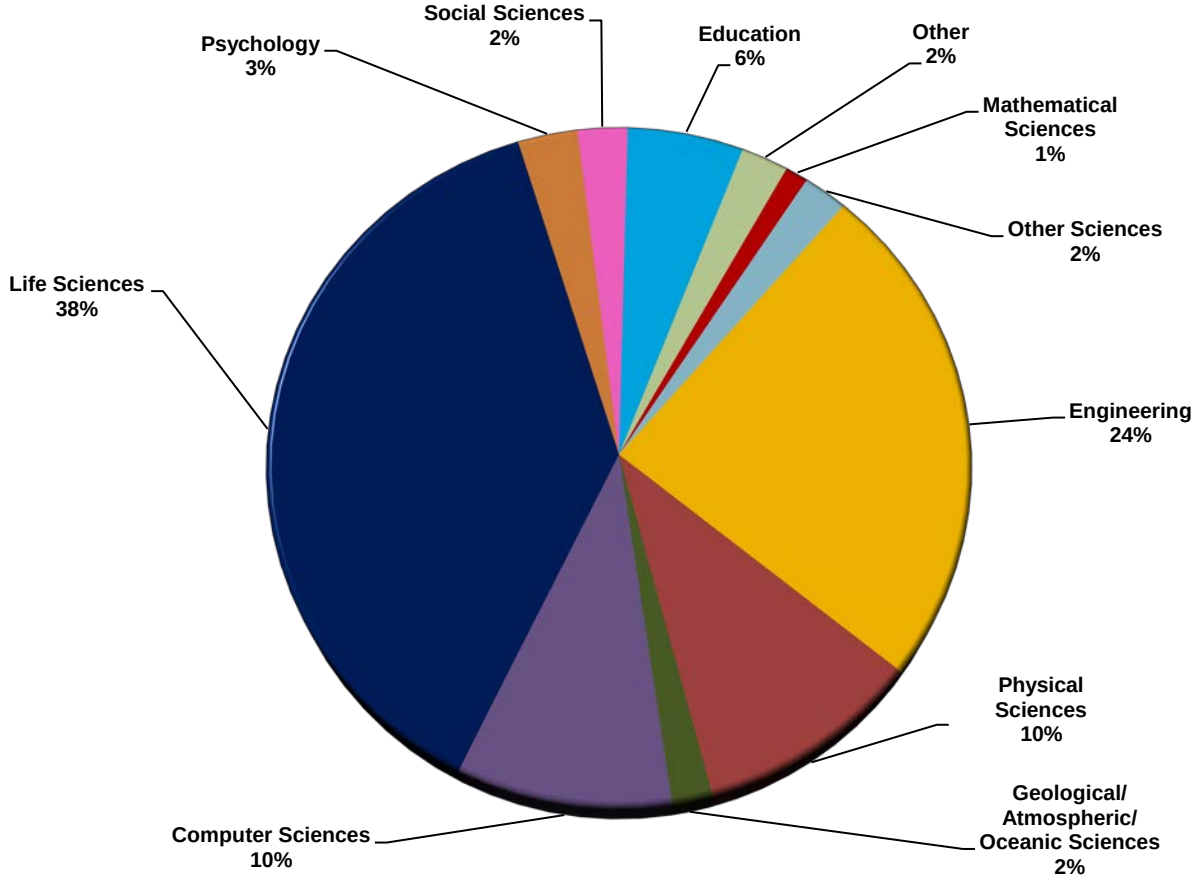
# Amherst

## *Total R&D Expenditures FY 2013- FY 2017*



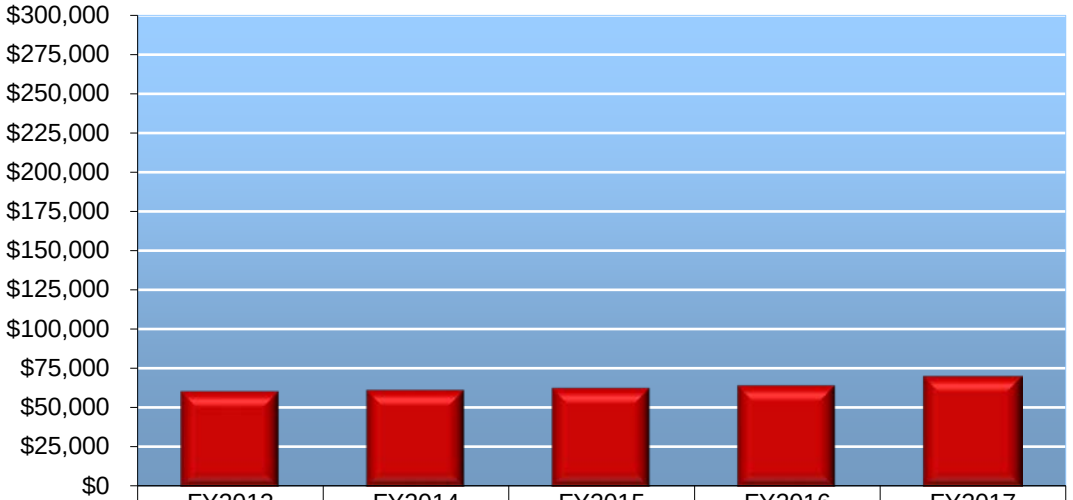

| | FY2013 | FY2014 | FY2015 | FY2016 | FY2017 |
|---|---|---|---|---|---|
| Total R&D ($000s) | $190,739 | $200,199 | $213,902 | $214,576 | $219,917 |
| Annual Growth | -2.1% | 5.0% | 6.8% | 0.3% | 2.5% |

## *Total R&D Expenditures FY 2017*



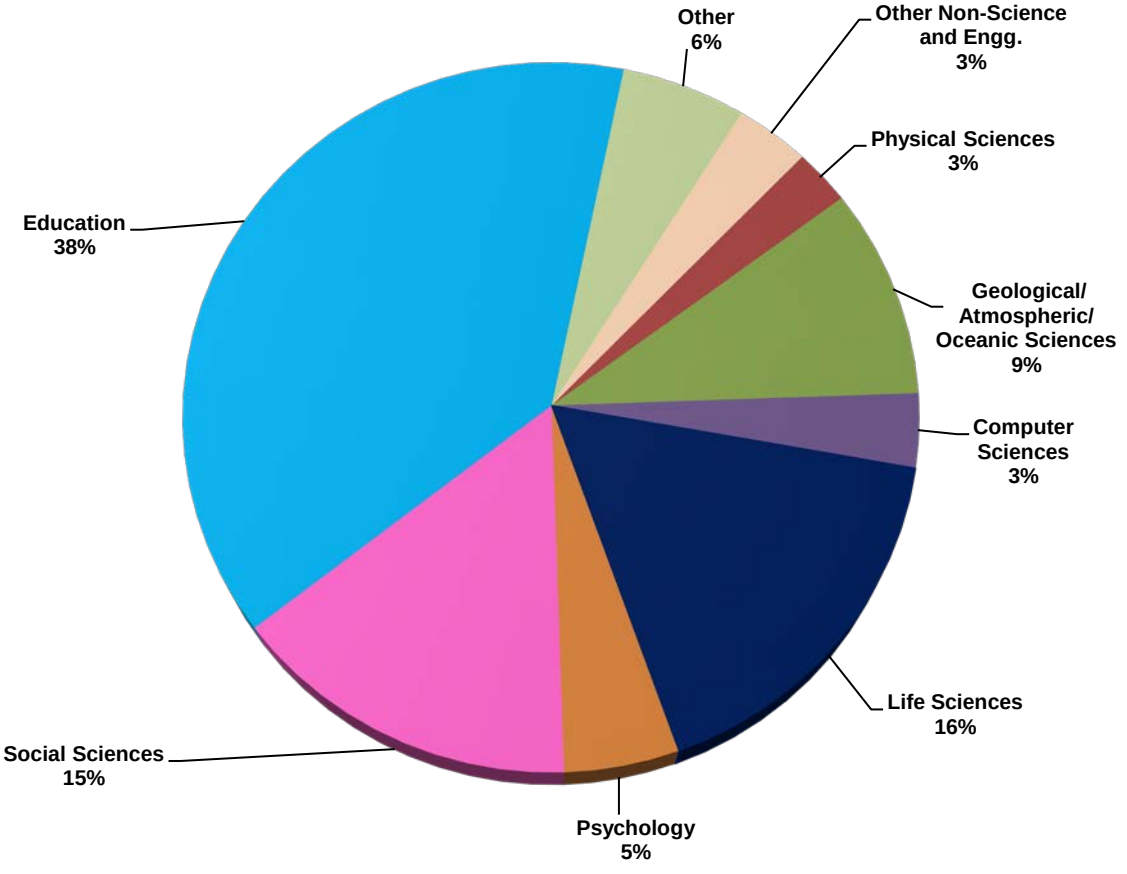
# Boston

## *Total R&D Expenditures FY 2013 - FY 2017*



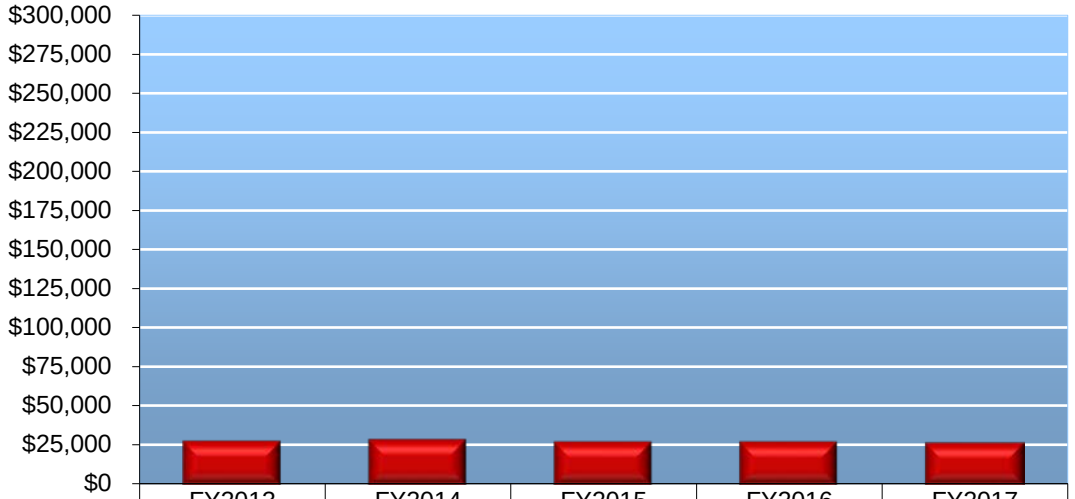

| | FY2013 | FY2014 | FY2015 | FY2016 | FY2017 |
|---|---|---|---|---|---|
| Total R&D ($000s) | $60,380 | $61,186 | $62,374 | $64,223 | $70,019 |
| Annual Growth | 0.5% | 1.3% | 1.9% | 3.0% | 9.0% |

## *Total R&D Expenditures FY 2017*



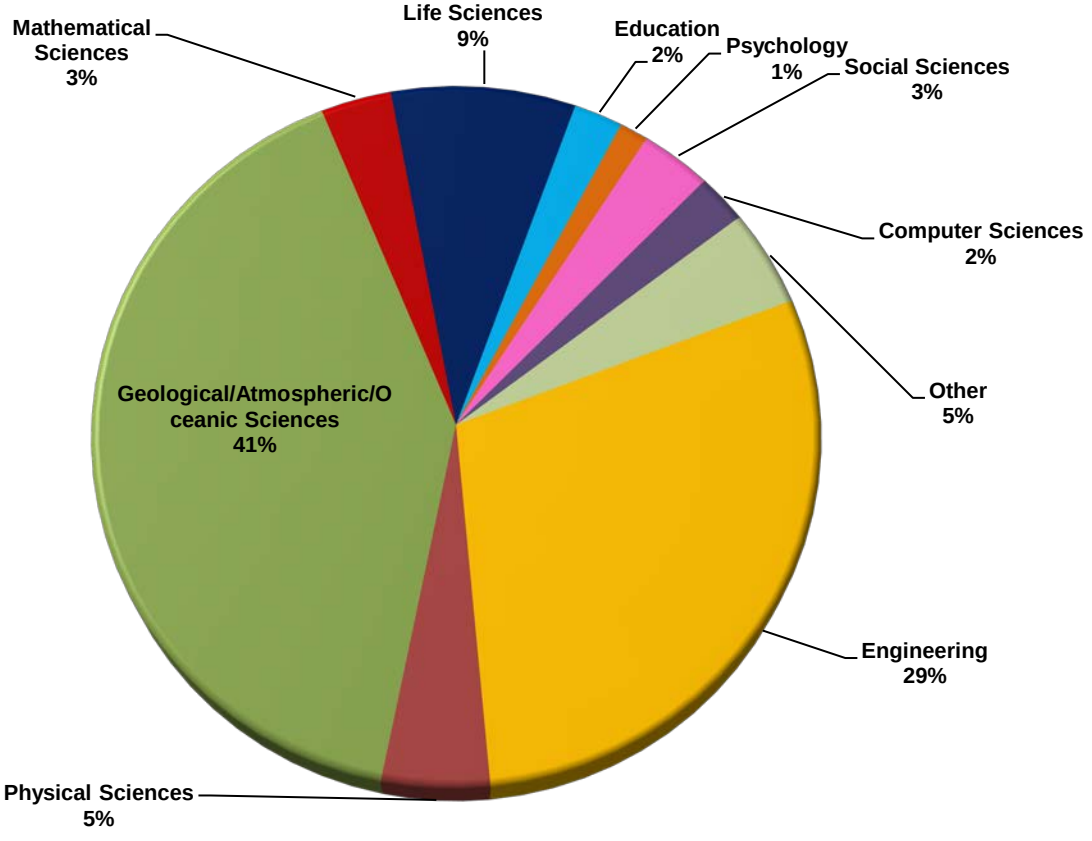
# Dartmouth

## *Total R&D Expenditures FY 2013 - FY 2017*



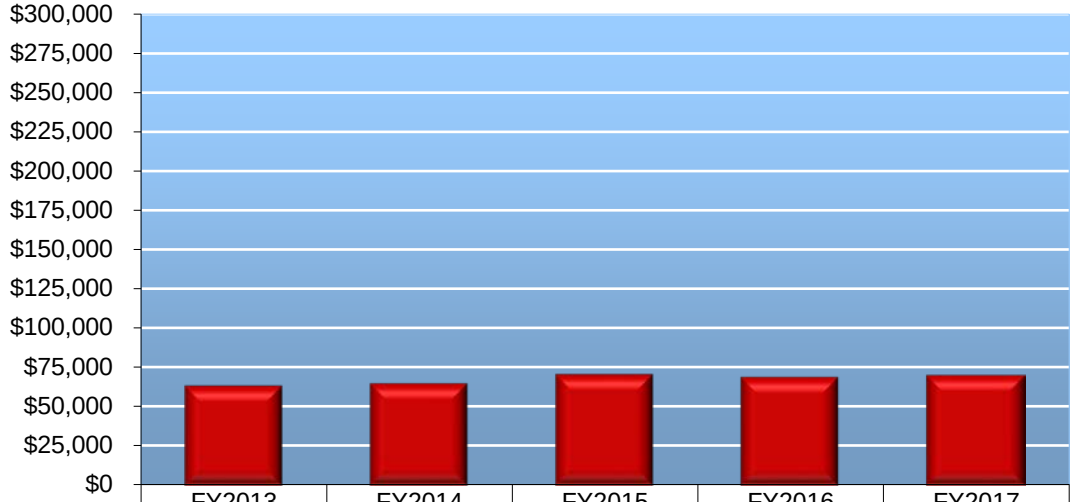

| | FY2013 | FY2014 | FY2015 | FY2016 | FY2017 |
|---|---|---|---|---|---|
| Total R&D ($000s) | $27,326 | $28,219 | $26,744 | $26,824 | $26,102 |
| Annual Growth | 20.2% | 3.3% | -5.2% | 0.3% | -2.7% |

## *Total R&D Expenditures FY 2017*



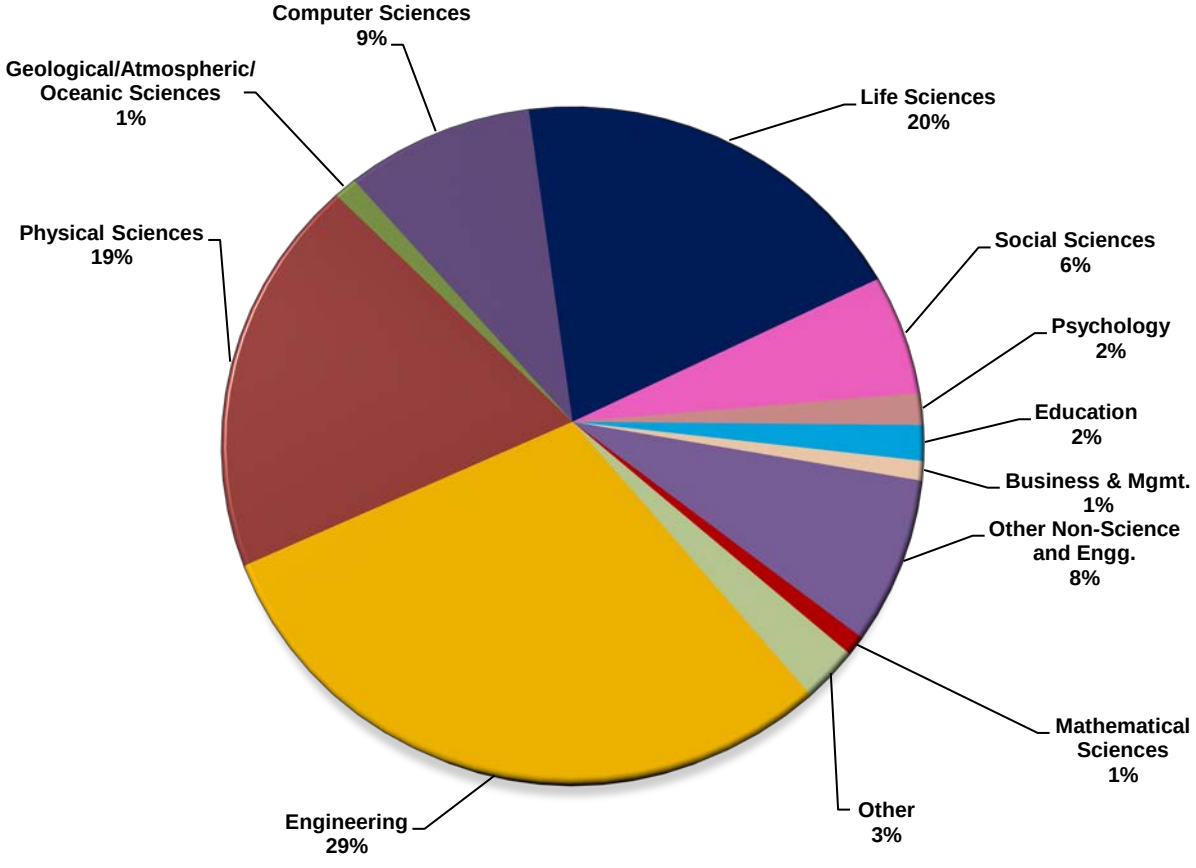
# Lowell

## *Total R&D Expenditures FY 2013 - FY 2017*

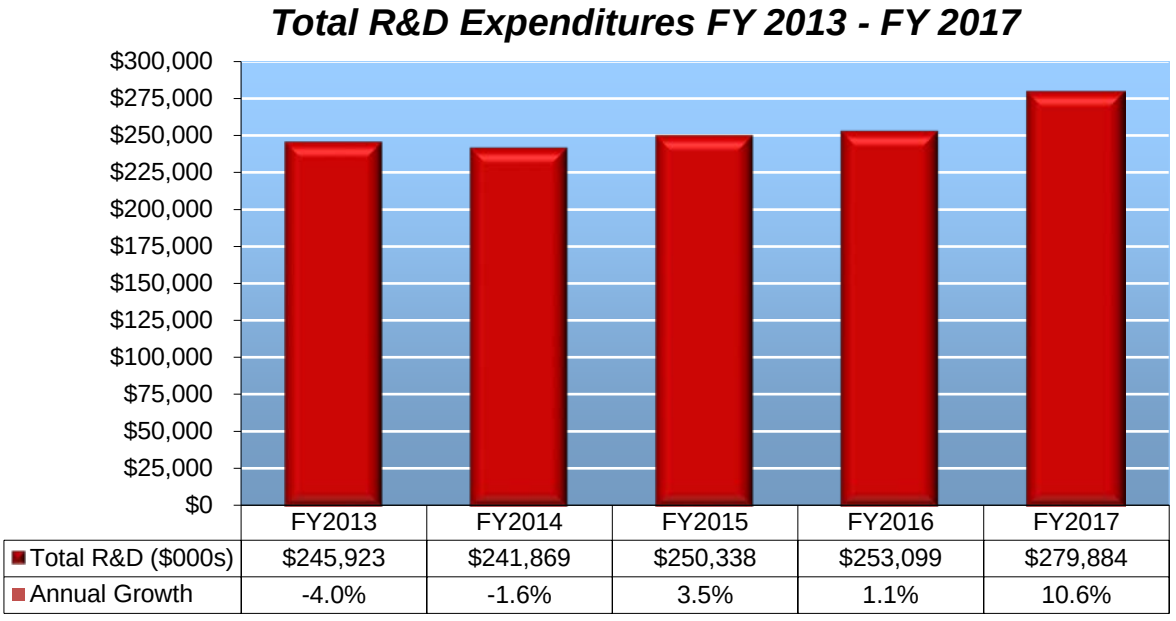



| | FY2013 | FY2014 | FY2015 | FY2016 | FY2017 |
|---|---|---|---|---|---|
| Total R&D ($000s) | $63,136 | $64,591 | $70,384 | $68,494 | $69,677 |
| Annual Growth | 4.1% | 2.3% | 9.0% | -2.7% | 1.7% |

## *Total R&D Expenditures FY 2017*



# Medical School

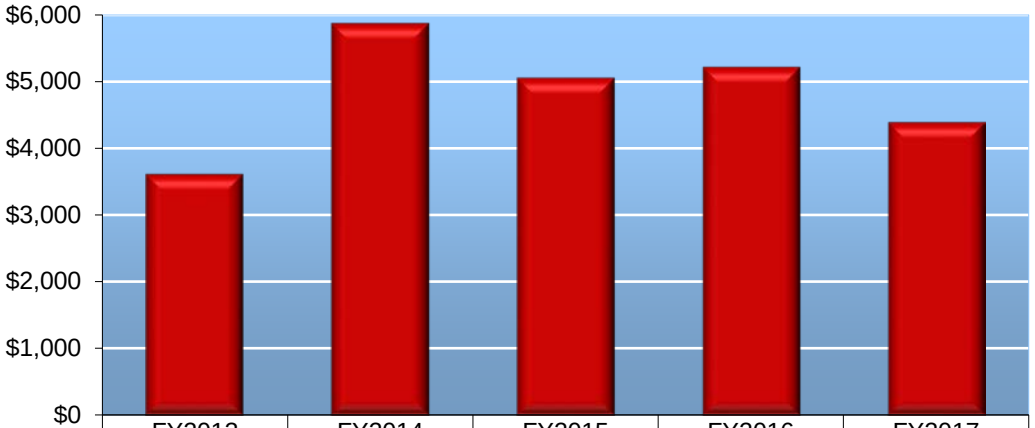



| | FY2013 | FY2014 | FY2015 | FY2016 | FY2017 |
|---|---|---|---|---|---|
| Total R&D ($000s) | $245,923 | $241,869 | $250,338 | $253,099 | $279,884 |
| Annual Growth | -4.0% | -1.6% | 3.5% | 1.1% | 10.6% |

**All of the Medical School's R&D expenditures are in the Life Sciences.**

# President's Office

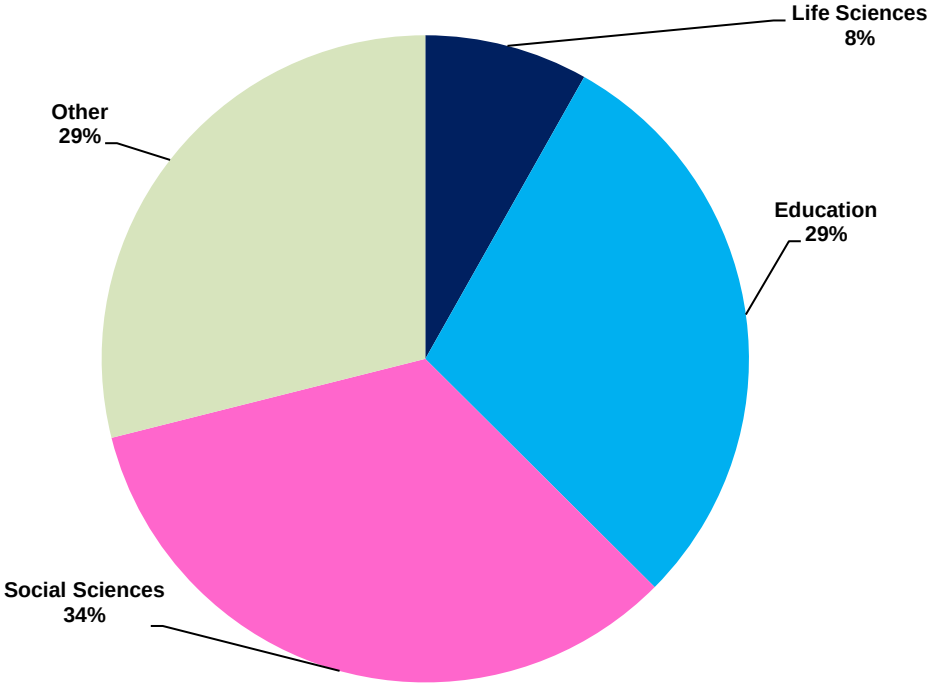
## *Total R&D Expenditures FY 2013 - FY 2017*

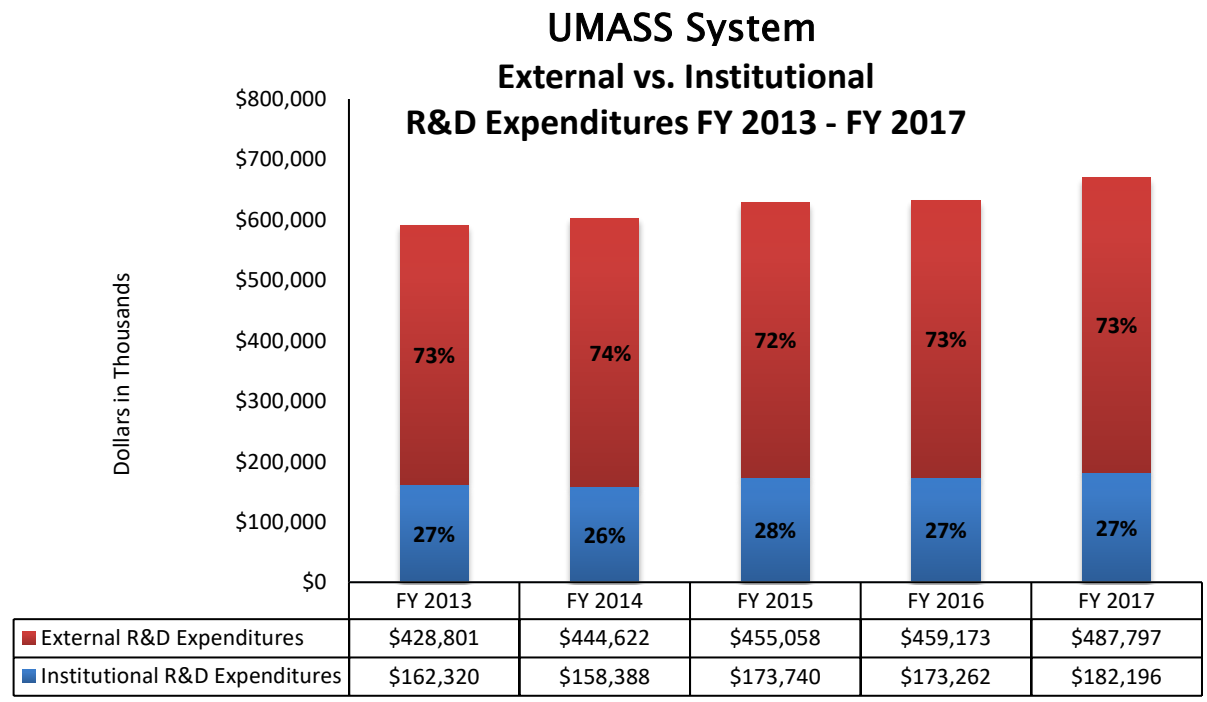



| | FY2013 | FY2014 | FY2015 | FY2016 | FY2017 |
|---|---|---|---|---|---|
| Total R&D ($000s) | $3,617 | $5,875 | $5,056 | $5,219 | $4,394 |
| Annual Growth | 14.0% | 62.4% | -13.9% | 3.2% | -15.8% |

# President's Office

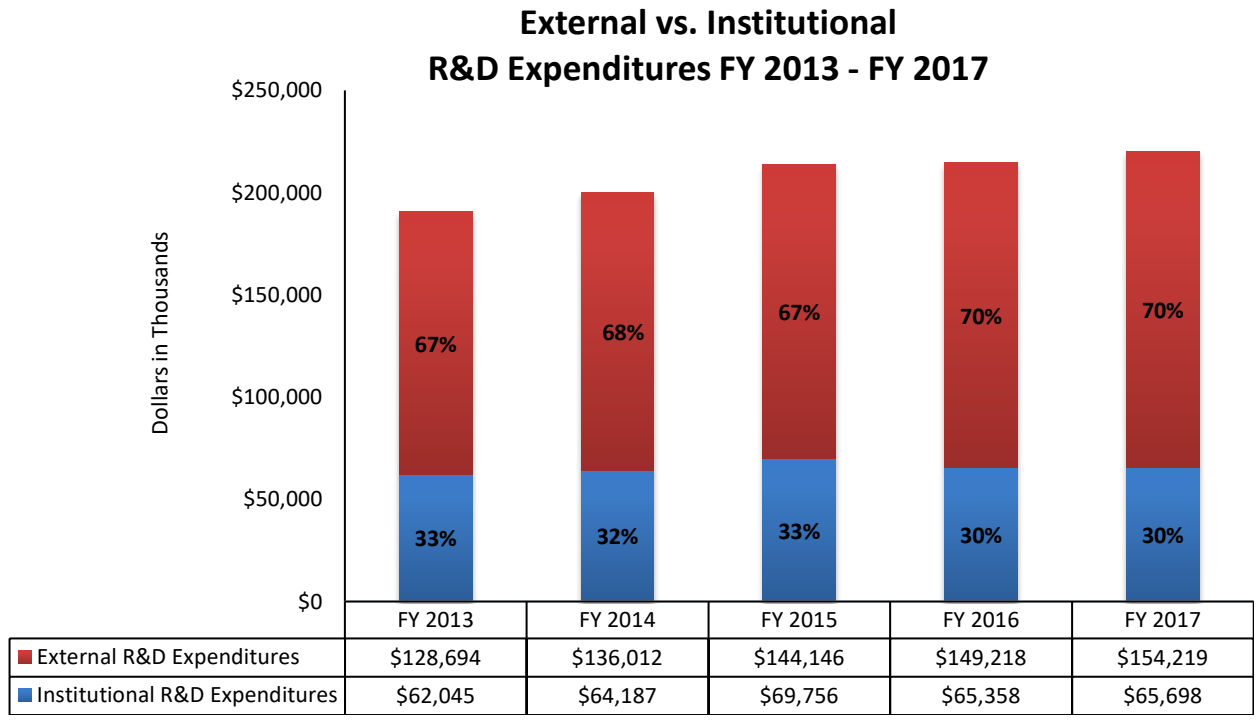
## *Total R&D Expenditures FY 2017*



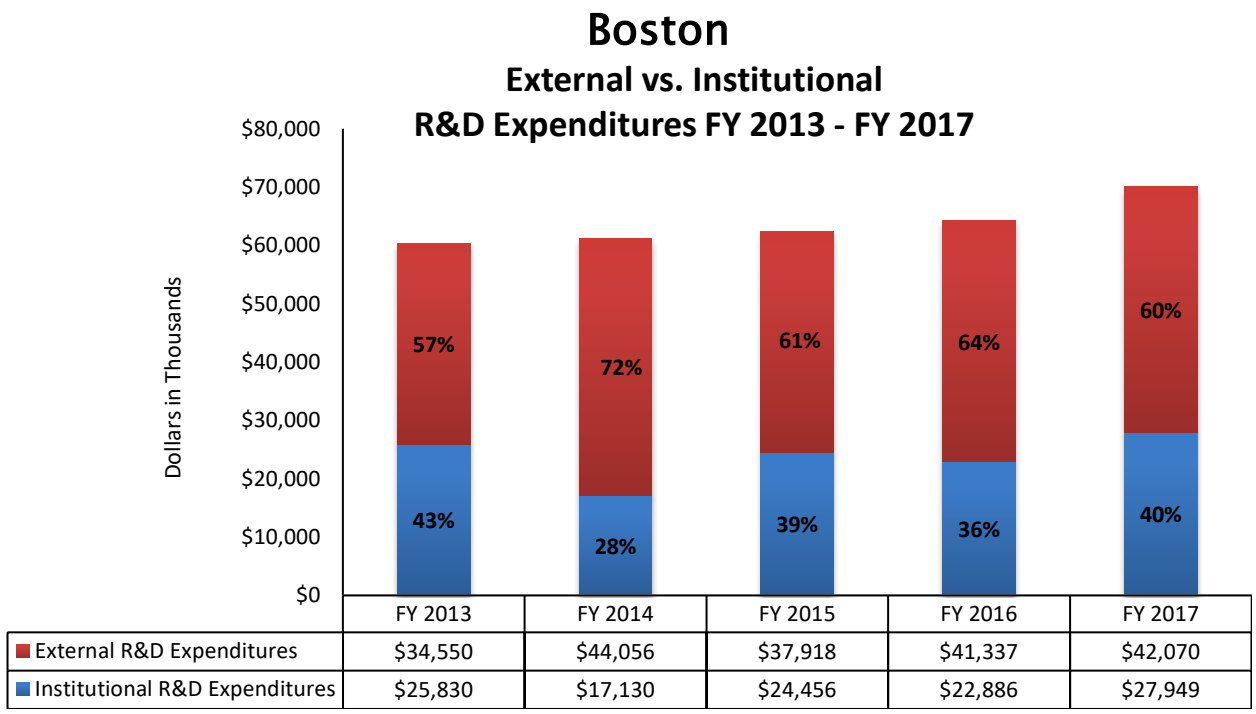



| UMASS ($000's) | FY 2013 - FY 2017 Total R&D Expenditures (Institutional vs. External Sources) | | | | |
|---|---|---|---|---|---|
| | Institutional R&D Expenditures | External R&D Expenditures | Total R&D Expenditures | % Institutional | % External |
| FY 2013 | $162,320 | $428,801 | $591,121 | 27% | 73% |
| FY 2014 | $158,388 | $444,622 | $603,010 | 26% | 74% |
| FY 2015 | $173,740 | $455,058 | $628,798 | 28% | 72% |
| FY 2016 | $173,262 | $459,173 | $632,435 | 27% | 73% |
| FY 2017 | $182,196 | $487,797 | $669,993 | 27% | 73% |

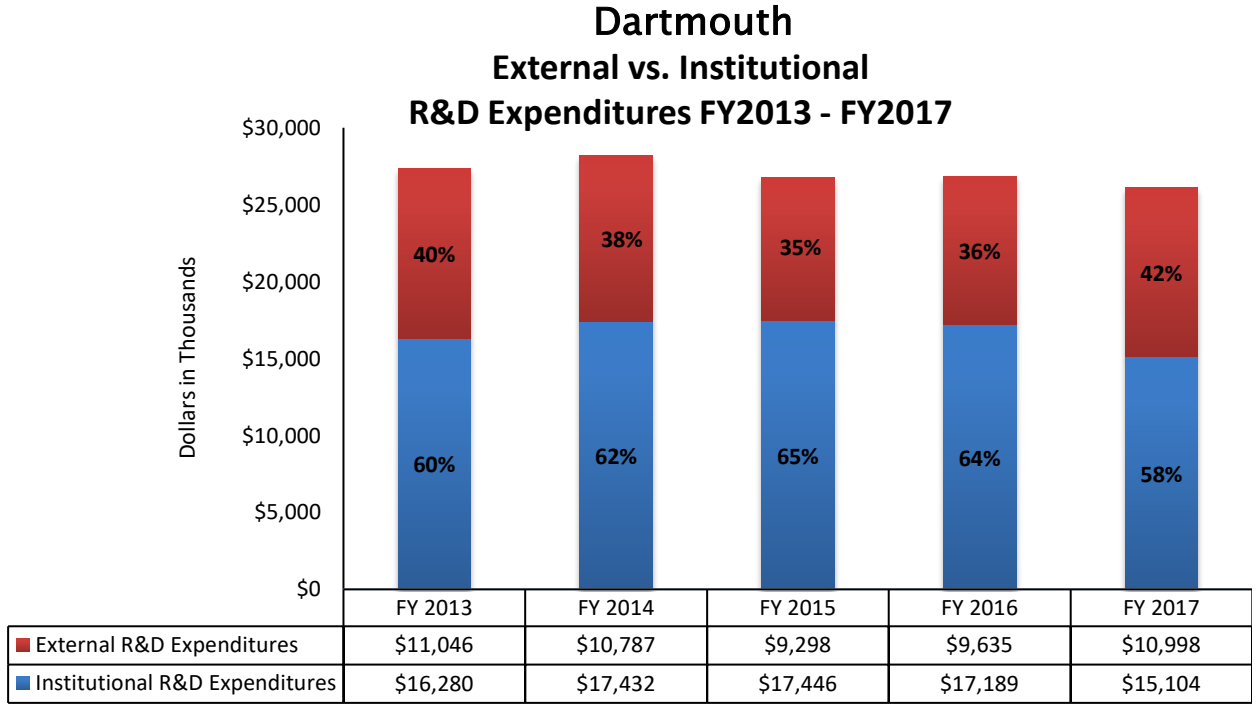
## Amherst




| UMASS AMHERST ($000's) | FY 2013 - FY 2017 Total R&D Expenditures (Institutional vs. External Sources) | | | | |
|---|---|---|---|---|---|
| | Institutional R&D Expenditures | External R&D Expenditures | Total R&D Expenditures | % Institutional | % External |
| FY 2013 | $62,045 | $128,694 | $190,739 | 33% | 67% |
| FY 2014 | $64,187 | $136,012 | $200,199 | 32% | 68% |
| FY 2015 | $69,756 | $144,146 | $213,902 | 33% | 67% |
| FY 2016 | $65,358 | $149,218 | $214,576 | 30% | 70% |
| FY 2017 | $65,698 | $154,219 | $219,917 | 30% | 70% |



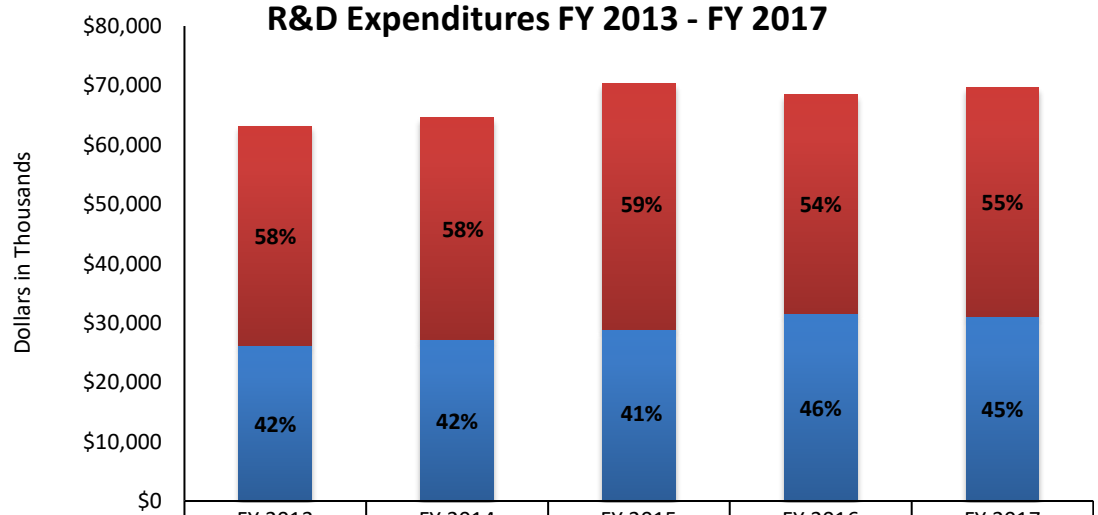

| UMASS BOSTON ($000's) | FY 2013 - FY 2017 Total R&D Expenditures (Institutional vs. External Sources) | | | | |
|---|---|---|---|---|---|
| | Institutional R&D Expenditures | External R&D Expenditures | Total R&D Expenditures | % Institutional | % External |
| FY 2013 | $25,830 | $34,550 | $60,380 | 43% | 57% |
| FY 2014 | $17,130 | $44,056 | $61,186 | 28% | 72% |
| FY 2015 | $24,456 | $37,918 | $62,374 | 39% | 61% |
| FY 2016 | $22,886 | $41,337 | $64,223 | 36% | 64% |
| FY 2017 | $27,949 | $42,070 | $70,019 | 40% | 60% |




| UMASS DARTMOUTH ($000's) | FY 2013 - FY 2017 Total R&D Expenditures (Institutional vs. External Sources) | | | | |
|---|---|---|---|---|---|
| | Institutional R&D Expenditures | External R&D Expenditures | Total R&D Expenditures | % Institutional | % External |
| FY 2013 | $16,280 | $11,046 | $27,326 | 60% | 40% |
| FY 2014 | $17,432 | $10,787 | $28,219 | 62% | 38% |
| FY 2015 | $17,446 | $9,298 | $26,744 | 65% | 35% |
| FY 2016 | $17,189 | $9,635 | $26,824 | 64% | 36% |
| FY 2017 | $15,104 | $10,998 | $26,102 | 58% | 42% |

## Lowell

### External vs. Institutional R&D Expenditures FY 2013 - FY 2017

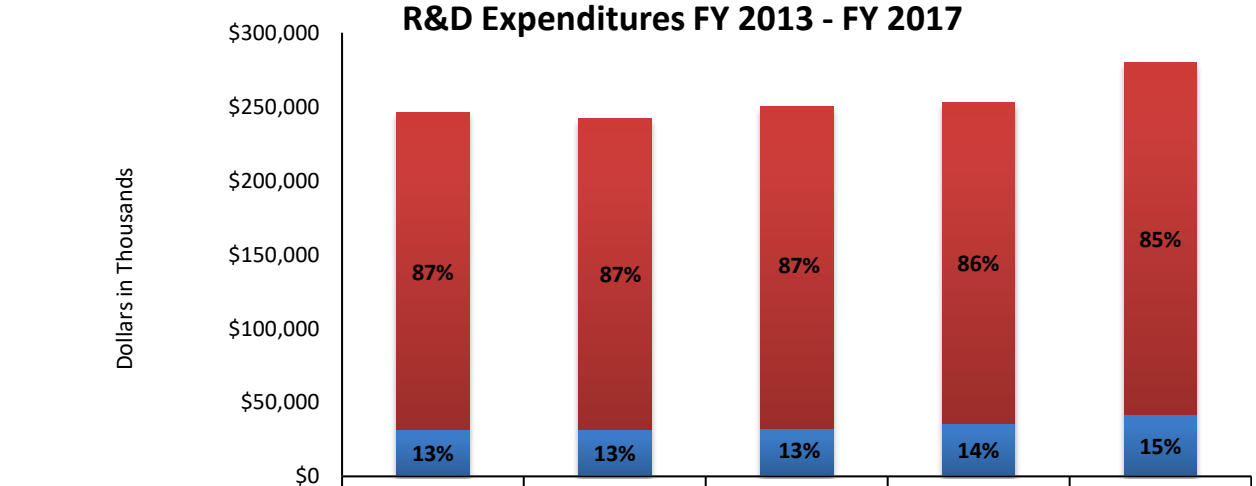



| | FY 2013 | FY 2014 | FY 2015 | FY 2016 | FY 2017 |
|---|---|---|---|---|---|
| External R&D Expenditures | $36,928 | $37,382 | $41,426 | $36,922 | $38,663 |
| Institutional R&D Expenditures | $26,208 | $27,209 | $28,958 | $31,572 | $31,014 |

| UMASS LOWELL ($000's) | FY 2013 - FY 2017 Total R&D Expenditures (Institutional vs. External Sources) | | | | |
|---|---|---|---|---|---|
| | Institutional R&D Expenditures | External R&D Expenditures | Total R&D Expenditures | % Institutional | % External |
| FY 2013 | $26,208 | $36,928 | $63,136 | 42% | 58% |
| FY 2014 | $27,209 | $37,382 | $64,591 | 42% | 58% |
| FY 2015 | $28,958 | $41,426 | $70,384 | 41% | 59% |
| FY 2016 | $31,572 | $36,922 | $68,494 | 46% | 54% |
| FY 2017 | $31,014 | $38,663 | $69,677 | 45% | 55% |

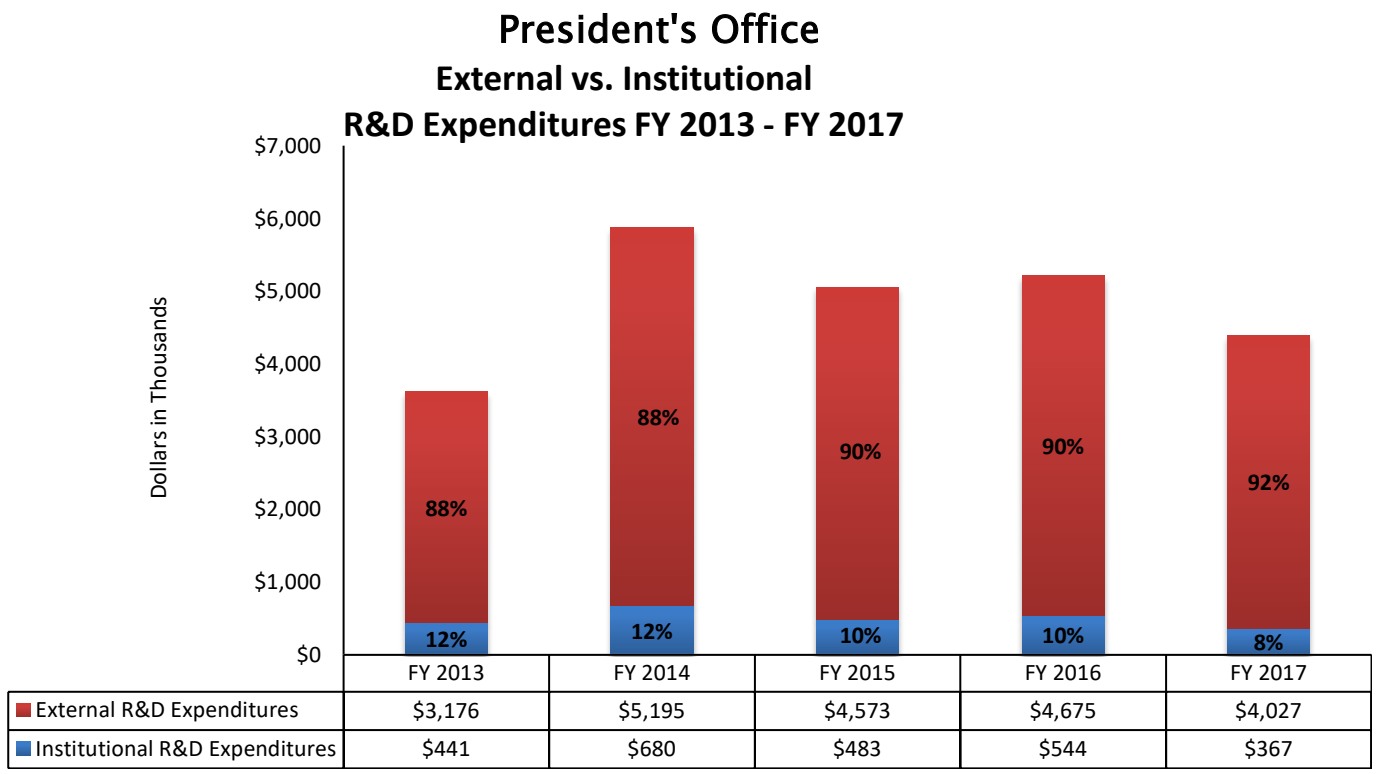
## Medical School

### External vs. Institutional R&D Expenditures FY 2013 - FY 2017




| | FY 2013 | FY 2014 | FY 2015 | FY 2016 | FY 2017 |
|---|---|---|---|---|---|
| External R&D Expenditures | $214,407 | $210,119 | $217,697 | $217,386 | $237,820 |
| Institutional R&D Expenditures | $31,516 | $31,750 | $32,641 | $35,713 | $42,064 |

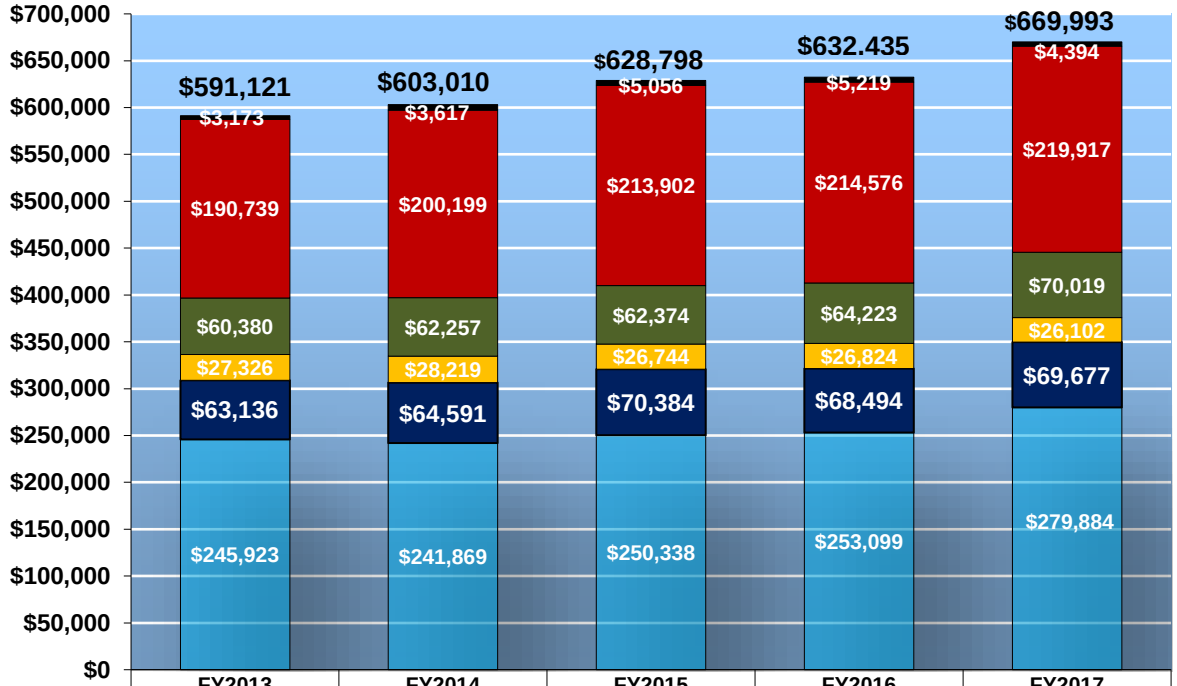
| UMASS MEDICAL SCHOOL ($000's) | FY 2013 - FY 2017 Total R&D Expenditures (Institutional vs. External Sources) | | | | |
|---|---|---|---|---|---|
| | Institutional R&D Expenditures | External R&D Expenditures | Total R&D Expenditures | % Institutional | % External |
| FY 2013 | $31,516 | $214,407 | $245,923 | 13% | 87% |
| FY 2014 | $31,750 | $210,119 | $241,869 | 13% | 87% |
| FY 2015 | $32,641 | $217,697 | $250,338 | 13% | 87% |
| FY 2016 | $35,713 | $217,386 | $253,099 | 14% | 86% |
| FY 2017 | $42,064 | $237,820 | $279,884 | 15% | 85% |




| UMASS PRESIDENTS OFFICE ($000's) | FY 2013 - FY 2017 Total R&D Expenditures (Institutional vs. External Sources) | | | | |
|---|---|---|---|---|---|
| | Institutional R&D Expenditures | External R&D Expenditures | Total R&D Expenditures | % Institutional | % External |
| FY 2013 | $441 | $3,176 | $3,617 | 12% | 88% |
| FY 2014 | $680 | $5,195 | $5,875 | 12% | 88% |
| FY 2015 | $483 | $4,573 | $5,056 | 10% | 90% |
| FY 2016 | $544 | $4,675 | $5,219 | 10% | 90% |
| FY 2017 | $367 | $4,027 | $4,394 | 8% | 92% |

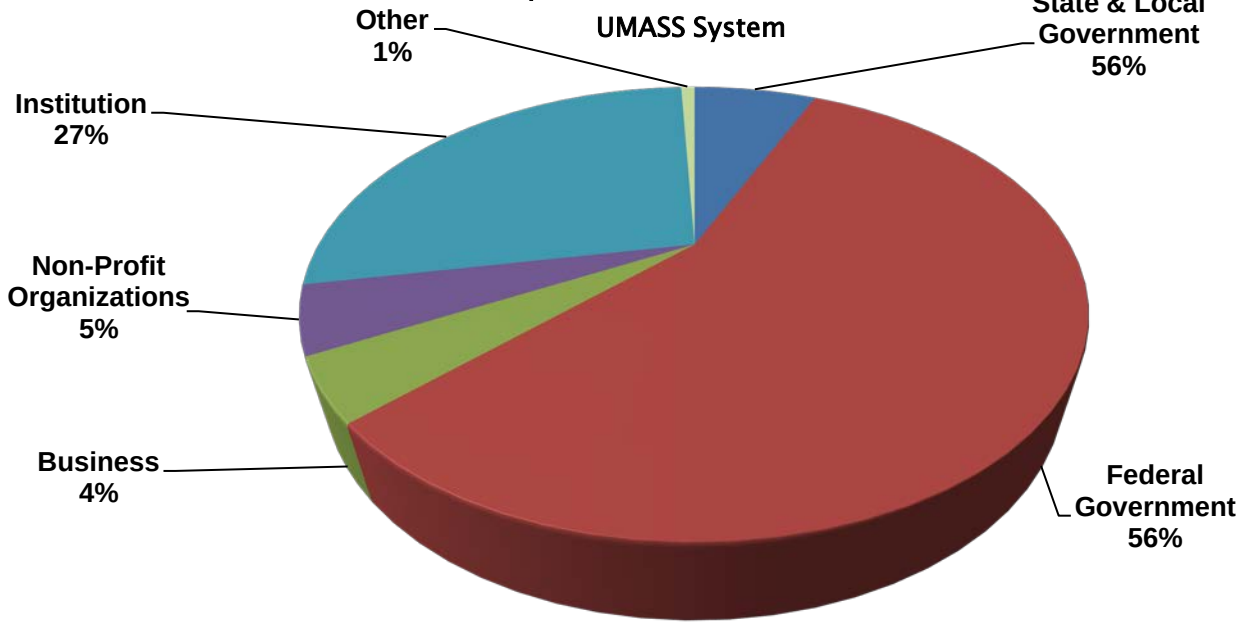
*Note: External R&D expenditures include all other sources of R&D expenditures reported in the NSF HERD survey (Federal, State and Local, Business and Non-Profit, Other), excluding Institutional R&D expenditures.*

## Total R&D Expenditures
## UMASS System FY 2013 – FY 2017




| | FY2013 | FY2014 | FY2015 | FY2016 | FY2017 |
|---|---|---|---|---|---|
| UM President's Office | $3,617 | $5,875 | $5,056 | $5,219 | $4,394 |
| UM Amherst | $190,739 | $200,199 | $213,902 | $214,576 | $219,917 |
| UM Boston | $60,380 | $62,257 | $62,374 | $64,223 | $70,019 |
| UM Dartmouth | $27,326 | $28,219 | $26,744 | $26,824 | $26,102 |
| UM Lowell | $63,136 | $64,591 | $70,384 | $68,494 | $69,677 |
| UM Medical School | $245,923 | $241,869 | $250,338 | $253,099 | $279,884 |

## Total R&D Expenditures
## by Source of Funds FY 2017
## UMASS System




*Source: Campus NSF surveys. All dollars are in thousands.*

# R&D Expenditures by Source – Details

*(Dollars in Thousands)*

| FY 2013 - FY 2017 Total R&D Expenditures | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | FY13 | FY14 | FY15 | FY16 | FY17 | 5-Year Change FY13-17 | | 1-Year Change FY16-17 | |
| | | | | | | $ | % | $ | % |
| **Amherst** | $190,739 | $200,199 | $213,902 | $214,576 | $219,917 | $29,178 | 15% | $5,341 | 2% |
| **Boston** | $60,380 | $61,186 | $62,374 | $64,223 | $70,019 | $9,639 | 16% | $5,796 | 9% |
| **Dartmouth** | $27,326 | $28,219 | $26,744 | $26,824 | $26,102 | -$1,224 | -4% | -$722 | -3% |
| **Lowell** | $63,136 | $64,591 | $70,384 | $68,494 | $69,677 | $6,541 | 10% | $1,183 | 2% |
| **Medical School** | $245,923 | $241,869 | $250,338 | $253,099 | $279,884 | $33,961 | 14% | $26,785 | 11% |
| **President's Office** | $3,617 | $5,875 | $5,056 | $5,219 | $4,394 | $777 | 21% | -$825 | -16% |
| **System** | **$591,121** | **$601,939** | **$628,798** | **$632,435** | **$669,993** | **$78,872** | **13%** | **$37,558** | **6%** |

| FY 2013 - FY 2017 Federal Total R&D Expenditures | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | FY13 | FY14 | FY15 | FY16 | FY17 | 5-Year Change FY13-17 | | 1-Year Change FY16-17 | |
| | | | | | | $ | % | $ | % |
| **Amherst** | $111,448 | $110,189 | $103,417 | $106,269 | $108,871 | -$2,577 | -2% | $2,602 | 2% |
| **Boston** | $24,924 | $27,715 | $28,653 | $30,608 | $29,934 | $5,010 | 20% | -$674 | -2% |
| **Dartmouth** | $8,860 | $8,549 | $7,321 | $6,548 | $7,370 | -$1,490 | -17% | $822 | 13% |
| **Lowell** | $27,360 | $28,654 | $31,059 | $27,694 | $29,471 | $2,111 | 8% | $1,777 | 6% |
| **Medical School** | $189,159 | $183,582 | $183,588 | $181,446 | $200,232 | $11,073 | 6% | $18,786 | 10% |
| **President's Office** | $2,126 | $3,468 | $1,445 | $1,124 | $721 | -$1,405 | -66% | -$403 | -36% |
| **System** | **$363,877** | **$362,157** | **$355,483** | **$353,689** | **$376,599** | **$12,722** | **3%** | **$22,910** | **6%** |

| FY 2013 - FY 2017 State & Local Total R&D Expenditures | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | FY13 | FY14 | FY15 | FY16 | FY17 | 5-Year Change FY13-17 | | 1-Year Change FY16-17 | |
| | | | | | | $ | % | $ | % |
| **Amherst** | $3,041 | $12,122 | $26,172 | $25,021 | $30,758 | $27,717 | 911% | $5,737 | 23% |
| **Boston** | $5,693 | $4,992 | $4,394 | $5,388 | $6,990 | $1,297 | 23% | $1,602 | 30% |
| **Dartmouth** | $1,462 | $1,742 | $1,327 | $1,864 | $1,976 | $514 | 35% | $112 | 6% |
| **Lowell** | $3,288 | $2,165 | $3,215 | $2,300 | $2,583 | -$705 | -21% | $283 | 12% |
| **Medical School** | $804 | $564 | $4,615 | $1,646 | $160 | -$644 | -80% | -$1,486 | -90% |
| **President's Office** | $556 | $1,333 | $2,071 | $2,870 | $2,688 | $2,132 | 383% | -$182 | -6% |
| **System** | **$14,844** | **$22,918** | **$41,794** | **$39,089** | **$45,155** | **$30,311** | **204%** | **$6,066** | **16%** |

*Source: Campus NSF HERD surveys. All dollars are in thousands.*

# R&D Expenditures by Source – Details (Cont'd)

## FY 2013- FY 2017 Industry-Sponsored Total R&D Expenditures

| | FY13 | | | FY14 | | | FY15 | | | FY16 | | | FY17 | | | 5-Year Change FY13-17 | | 1-Year Change FY16-17 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Business | Non-Profits | Total | Business | Non-Profits | Total | Business | Non-Profits | Total | Business | Non-Profits | Total | Business | Non-Profits | Total | $ | % | $ | % |
| **Amherst** | $7,614 | $5,450 | $13,064 | $6,533 | $5,812 | $12,345 | $7,393 | $5,278 | $12,671 | $8,336 | $7,585 | $15,921 | $8,016 | $5,349 | $13,365 | $301 | 2.3% | -$2,556 | -16% |
| **Boston** | $97 | $3,219 | $3,316 | $721 | $2,867 | $3,588 | $1,499 | $2,991 | $4,490 | $1,291 | $3,616 | $4,907 | $1,279 | $3,541 | $4,820 | $1,504 | 45.4% | -$87 | -2% |
| **Dartmouth** | $425 | $208 | $633 | $180 | $274 | $454 | $365 | $201 | $566 | $831 | $205 | $1,036 | $557 | $861 | $1,418 | $785 | 124.0% | $382 | 37% |
| **Lowell** | $4,303 | $1,115 | $5,418 | $3,921 | $1,569 | $5,490 | $4,634 | $1,568 | $6,202 | $4,775 | $1,322 | $6,097 | $4,841 | $1,454 | $6,295 | $877 | 16.2% | $198 | 3% |
| **Medical School** | $8,795 | $14,948 | $23,743 | $6,925 | $16,349 | $23,274 | $9,452 | $17,609 | $27,061 | $11,483 | $19,789 | $31,272 | $14,324 | $20,204 | $34,528 | $10,785 | 45.4% | $3,256 | 10% |
| **President's Office** | $19 | $418 | $437 | $8 | $360 | $368 | $221 | $814 | $1,035 | $180 | $476 | $656 | $39 | $575 | $614 | $177 | 40.5% | -$42 | -6% |
| **System** | **$21,253** | **$25,358** | **$46,611** | **$18,288** | **$27,231** | **$45,519** | **$23,564** | **$28,461** | **$52,025** | **$26,896** | **$32,993** | **$59,889** | **$29,056** | **$31,984** | **$61,040** | **$14,429** | 31.0% | **$1,151** | **2%** |

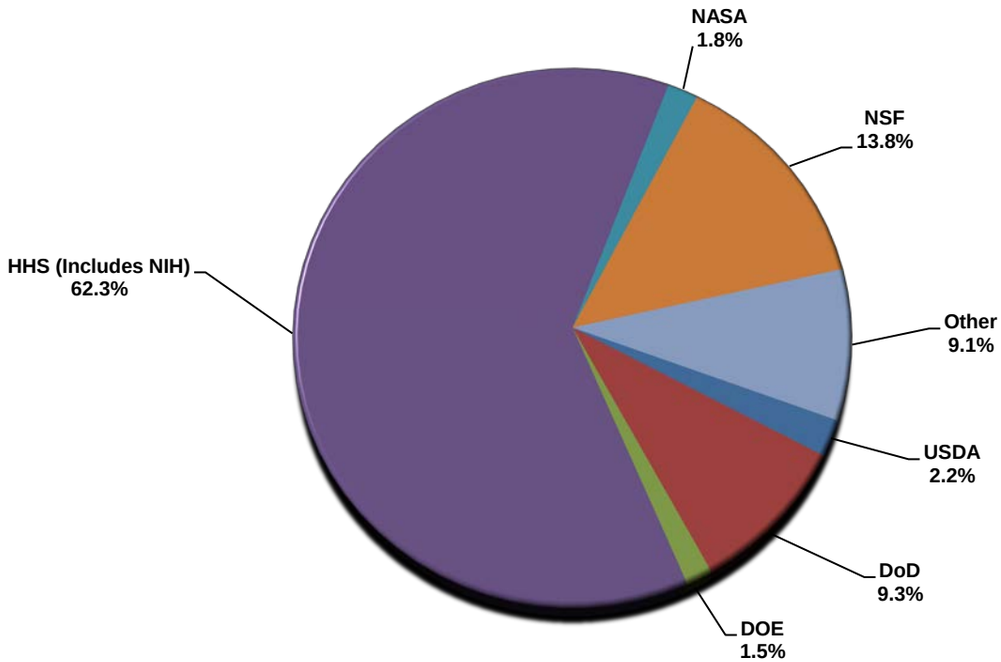
## FY 2013 - FY 2017 Institutional Total R&D Expenditures

| | FY13 | FY14 | FY15 | FY16 | FY17 | 5-Year Change FY13-17 | | 1-Year Change FY16-17 | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $ | % | $ | % |
| **Amherst** | $62,045 | $64,187 | $69,756 | $65,358 | $65,698 | $3,653 | 5.9% | $340 | 0.5% |
| **Boston** | $25,830 | $17,130 | $24,456 | $22,886 | $27,949 | $2,119 | 8.2% | $5,063 | 22.1% |
| **Dartmouth** | $16,280 | $17,432 | $17,446 | $17,189 | $15,104 | -$1,176 | -7.2% | -$2,085 | -12.1% |
| **Lowell** | $26,208 | $27,209 | $28,958 | $31,572 | $31,014 | $4,806 | 18.3% | -$558 | -1.8% |
| **Medical School** | $31,516 | $31,750 | $32,641 | $35,713 | $42,064 | $10,548 | 33.5% | $6,351 | 17.8% |
| **President's Office** | $441 | $680 | $483 | $544 | $367 | -$74 | -16.8% | -$177 | -32.5% |
| **System** | **$162,320** | **$158,388** | **$173,740** | **$173,262** | **$182,196** | **$19,876** | **12.2%** | **$8,934** | **5.2%** |

## FY 2013 - FY 2017 Other Total R&D Expenditures

| | FY13 | FY14 | FY15 | FY16 | FY17 | 5-Year Change FY13-17 | | 1-Year Change FY16-17 | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $ | % | $ | % |
| **Amherst** | $1,141 | $1,356 | $1,886 | $2,007 | $1,225 | $84 | 7.4% | -$782 | -39.0% |
| **Boston** | $617 | $311 | $381 | $434 | $326 | -$291 | -47.2% | -$108 | -24.9% |
| **Dartmouth** | $91 | $42 | $84 | $187 | $234 | $143 | 157.1% | $47 | 25.1% |
| **Lowell** | $862 | $1,073 | $950 | $831 | $314 | -$548 | -63.6% | -$517 | -62.2% |
| **Medical School** | $701 | $2,699 | $2,433 | $3,022 | $2,900 | $2,199 | na | -$122 | -4.0% |
| **President's Office** | $57 | $26 | $22 | $25 | $4 | -$53 | na | -$21 | -84.0% |
| **System** | **$3,469** | **$5,507** | **$5,756** | **$6,506** | **$5,003** | **$1,534** | **44.2%** | **-$1,503** | **-23.1%** |

## Total R&D Expeditures
## by Federal Government Agency Sources FY 2017
## UMASS System




| | Total Federal $ | USDA | % of Campus Total | DoD | % of Campus Total | DOE | % of Campus Total | HHS (includes NIH) | % of Campus Total | NASA | % of Campus Total | NSF | % of Campus Total | Other | % of Campus Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Amherst** | **$108,871** | $7,887 | 7.2% | $14,533 | 13.3% | $4,336 | 4.0% | $26,986 | 24.8% | $3,123 | 2.9% | $36,819 | 33.8% | $15,187 | 13.9% |
| **Boston** | **$29,934** | $0 | 0.0% | $820 | 2.7% | $0 | 0.0% | $10,353 | 34.6% | $1,450 | 4.8% | $5,118 | 17.1% | $12,193 | 40.7% |
| **Dartmouth** | **$7,370** | $92 | 1.2% | $1,374 | 18.6% | $135 | 1.8% | $296 | 4.0% | $551 | 7.5% | $2,440 | 33.1% | $2,482 | 33.7% |
| **Lowell** | **$29,471** | $27 | 0.1% | $8,754 | 29.7% | $1,149 | 3.9% | $7,985 | 27.1% | $1,810 | 6.1% | $6,212 | 21.1% | $3,534 | 12.0% |
| **Medical School** | **$200,232** | $271 | 0.1% | $9,436 | 4.7% | $0 | 0.0% | $188,502 | 94.1% | $0 | 0.0% | $1,452 | 0.7% | $571 | 0.3% |
| **President's Office** | **$721** | $0 | 0.0% | $0 | 0.0% | $0 | 0.0% | $378 | 52.4% | $0 | 0.0% | $80 | 11.1% | $263 | 36.5% |
| **System** | **$376,599** | **$8,277** | **2.2%** | **$34,917** | **9.3%** | **$5,620** | **1.5%** | **$234,500** | **62.3%** | **$6,934** | **1.8%** | **$52,121** | **13.8%** | **$34,230** | **9.1%** |

*Source: Campus NSF surveys. All dollars are in thousands.*
*Note: HHS includes NIH*

# FY 2017 Total R&D Expenditures by Field (Federal and Non-Federal)

| FIELD | UMA Federal | UMA Non-Federal | UMA Total | UMA % of UMA Total | UMA % of Field | UMB Federal | UMB Non-Federal | UMB Total | UMB % of UMB Total | UMB % of Field |
|---|---|---|---|---|---|---|---|---|---|---|
| **Engineering (Total)** | **$27,264** | **$26,454** | **$53,718** | **24.4%** | **64.4%** | **$477** | **$1,072** | **$1,549** | **2.2%** | **1.9%** |
| Aerosp., Aeronaut., Astronaut. Engg. | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% |
| Bioengineering/Biomedical | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% |
| Chemical | $9,839 | $7,598 | $17,437 | 7.9% | 72.1% | $0 | $0 | $0 | 0.0% | 0.0% |
| Civil | $5,056 | $10,357 | $15,413 | 7.0% | 77.3% | $52 | $1 | $53 | 0.1% | 0.0% |
| Electrical | $7,825 | $3,982 | $11,807 | 5.4% | 52.2% | $425 | $1,071 | $1,496 | 2.1% | 6.6% |
| Industrial and Manufacturing | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% |
| Mechanical | $3,932 | $3,732 | $7,664 | 3.5% | 54.9% | $0 | $0 | $0 | 0.0% | 0.0% |
| Metallurgical & Materials | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% |
| Other | $612 | $785 | $1,397 | 0.6% | 75.4% | $0 | $0 | $0 | 0.0% | 0.0% |
| **Physical Sciences (Total)** | **$13,988** | **$8,395** | **$22,383** | **10.2%** | **57.7%** | **$1,141** | **$622** | **$1,763** | **2.5%** | **4.5%** |
| Astronomy and Astrophysics | $2,689 | $831 | $3,520 | 1.6% | 100.0% | $0 | $0 | $0 | 0.0% | 0.0% |
| Chemistry | $7,149 | $4,284 | $11,433 | 5.2% | 71.9% | $548 | $310 | $858 | 1.2% | 5.4% |
| Materials Science | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% |
| Physics | $4,150 | $3,280 | $7,430 | 3.4% | 38.4% | $593 | $312 | $905 | 1.3% | 4.7% |
| Other Physical Sciences | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% |
| **Geo/Atmosp./Ocean Sciences (Total)** | **$2,568** | **$1,398** | **$3,966** | **1.8%** | **18.1%** | **$3,692** | **$2,895** | **$6,587** | **9.4%** | **30.0%** |
| Atmospheric Sc. And Meteorology | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% |
| Geological and Earth Sciences | $2,568 | $1,398 | $3,966 | 1.8% | 58.2% | $1,811 | $253 | $2,064 | 2.9% | 0.0% |
| Ocean Sciences and Marine Sciences | $0 | $0 | $0 | 0.0% | 0.0% | $1,881 | $2,642 | $4,523 | 6.5% | 29.9% |
| Other Geo/Atmosp./Ocean Sciences | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% |
| **Mathematics and Statistics (Total)** | **$1,599** | **$793** | **$2,392** | **1.1%** | **59.0%** | **$127** | **$61** | **$188** | **0.3%** | **4.6%** |
| **Computer Sciences (Total)** | **$14,982** | **$6,144** | **$21,126** | **9.6%** | **69.3%** | **$1,401** | **$907** | **$2,308** | **3.3%** | **7.6%** |
| **Life Sciences (Total)** | **$34,509** | **$49,249** | **$83,758** | **38.1%** | **21.4%** | **$4,613** | **$6,865** | **$11,478** | **16.4%** | **2.9%** |
| Agricultural | $6,221 | $5,797 | $12,018 | 5.5% | 100.0% | $0 | $0 | $0 | 0.0% | 0.0% |
| Biological and Biomedical Sciences | $11,801 | $8,250 | $20,051 | 9.1% | 17.5% | $2,328 | $914 | $3,242 | 4.6% | 2.8% |
| Health Sciences | $11,467 | $9,360 | $20,827 | 9.5% | 15.0% | $2,282 | $5,778 | $8,060 | 11.5% | 5.8% |
| Natural Resources and Conservation | $4,717 | $3,711 | $8,428 | 3.8% | 100.0% | $3 | $0 | $3 | 0.0% | 0.0% |
| Other Life Sciences | $303 | $22,131 | $22,434 | 10.2% | 19.0% | $0 | $173 | $173 | 0.2% | 0.1% |
| **Psychology (Total)** | **$3,682** | **$2,581** | **$6,263** | **2.8%** | **56.8%** | **$1,969** | **$1,387** | **$3,356** | **4.8%** | **30.4%** |
| **Social Sciences (Total)** | **$1,474** | **$3,760** | **$5,234** | **2.4%** | **23.9%** | **$2,561** | **$7,701** | **$10,262** | **14.7%** | **46.9%** |
| Anthropology | $126 | $791 | $917 | 0.4% | 40.8% | $896 | $420 | $1,316 | 1.9% | 58.6% |
| Economics | $270 | $641 | $911 | 0.4% | 41.3% | $32 | $178 | $210 | 0.3% | 9.5% |
| Political Science and Government | $201 | $993 | $1,194 | 0.5% | 20.5% | $158 | $4,064 | $4,222 | 6.0% | 72.5% |
| Sociology, Demography, Popn. Studies | $218 | $392 | $610 | 0.3% | 12.6% | $1,284 | $1,731 | $3,015 | 4.3% | 62.3% |
| Other Social Sciences | $659 | $943 | $1,602 | 0.7% | 23.6% | $191 | $1,308 | $1,499 | 2.1% | 22.1% |
| **Other Sciences (Total)** | **$1,926** | **$2,765** | **$4,691** | **2.1%** | **76.1%** | **$327** | **$111** | **$438** | **0.6%** | **0.0%** |
| **TOTAL, SCI & ENG FIELDS** | **$101,992** | **$101,539** | **$203,531** | **92.5%** | **33.4%** | **$16,308** | **$21,621** | **$37,929** | **54.2%** | **6.2%** |
| **FIELD** | **Federal** | **Non-Federal** | **UMA Total** | **% of UMA Total** | **% of Field** | **Federal** | **Non-Federal** | **UMB Total** | **% of UMB Total** | **% of Field** |
| Business Mgmt. & Business Admn. | $147 | $965 | $1,112 | 0.5% | 23.7% | $124 | $2,582 | $2,706 | 3.9% | 57.7% |
| Comm., and Comm. Technologies | $0 | $458 | $458 | 0.2% | 68.4% | $0 | $11 | $11 | 0.0% | 0.0% |
| Education | $6,616 | $5,552 | $12,168 | 5.5% | 29.1% | $13,379 | $13,171 | $26,550 | 37.9% | 63.6% |
| Humanities | $33 | $1,578 | $1,611 | 0.7% | 44.9% | $84 | $258 | $342 | 0.5% | 9.5% |
| Law | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% |
| Social Work | $0 | $0 | $0 | 0.0% | 0.0% | $19 | $126 | $145 | 0.2% | 0.0% |
| Visual and Performing Arts | $83 | $870 | $953 | 0.4% | 54.9% | $0 | $36 | $36 | 0.1% | 2.1% |
| Other Non-Science and Engin. | $0 | $84 | $84 | 0.0% | 1.1% | $20 | $2,280 | $2,300 | 3.3% | 28.8% |
| **TOTAL, NON-SCI & ENG FIELDS** | **$6,879** | **$9,507** | **$16,386** | **7.5%** | **27.0%** | **$13,626** | **$18,464** | **$32,090** | **45.8%** | **52.9%** |
| **TOTAL, SCI & ENG FIELDS** | **$101,992** | **$101,539** | **$203,531** | **92.5%** | **33.4%** | **$16,308** | **$21,621** | **$37,929** | **54.2%** | **6.2%** |
| **GRAND TOTAL** | **$108,871** | **$111,046** | **$219,917** | **100.0%** | **32.8%** | **$29,934** | **$40,085** | **$70,019** | **100.0%** | **10.5%** |

**Source: Campus NSF HERD Surveys. All dollars are in thousands.**

*Note: Percent of Total is the percent each field represents of total campus or system R&D expenditures in all fields.*
*Percent of Field is the percent of the UMass system's expenditures in a particular field represented by that campus.*

# FY 2017 Total R&D Expenditures by Field (Federal and Non-Federal)

| FIELD | UMD Federal | UMD Non-Federal | UMD Total | UMD % of UMD Total | UMD % of Field | UML Federal | UML Non-Federal | UML Total | UML % of UML Total | UML % of Field |
|---|---|---|---|---|---|---|---|---|---|---|
| **Engineering (Total)** | **$2,598** | **$5,068** | **$7,666** | **29.4%** | **9.2%** | **$7,695** | **$12,727** | **$20,422** | **29.3%** | **24.5%** |
| Aerosp., Aeronaut., Astronaut. Engg. | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | **0.0%** | 0.0% |
| Bioengineering/Biomedical | $110 | $702 | $812 | 3.1% | 100.0% | $0 | $0 | $0 | 0.0% | 0.0% |
| Chemical | $0 | $0 | $0 | 0.0% | 0.0% | $2,257 | $4,485 | $6,742 | 9.7% | 27.9% |
| Civil | $663 | $2,425 | $3,088 | 11.8% | 15.5% | $595 | $797 | $1,392 | 2.0% | 7.0% |
| Electrical | $1,281 | $1,168 | $2,449 | 9.4% | 10.8% | $2,495 | $4,369 | $6,864 | 9.9% | 30.4% |
| Industrial and Manufacturing | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% |
| Mechanical | $544 | $526 | $1,070 | 4.1% | 7.7% | $2,300 | $2,926 | $5,226 | 7.5% | 37.4% |
| Metallurgical & Materials | $0 | $1 | $1 | 0.0% | 100.0% | $0 | $0 | $0 | 0.0% | 0.0% |
| Other | $0 | $246 | $246 | 0.9% | 13.3% | $48 | $150 | $198 | 0.3% | 10.7% |
| **Physical Sciences (Total)** | **$205** | **$1,012** | **$1,217** | **4.7%** | **3.1%** | **$8,137** | **$5,288** | **$13,425** | **19.3%** | **34.6%** |
| Astronomy and Astrophysics | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% |
| Chemistry | $165 | $784 | $949 | 3.6% | 6.0% | $771 | $1,900 | $2,671 | 3.8% | 16.8% |
| Materials Science | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% |
| Physics | $40 | $228 | $268 | 1.0% | 1.4% | $7,366 | $3,388 | $10,754 | 15.4% | 55.6% |
| Other Physical Sciences | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% |
| **Geo/Atmosp./Ocean Sciences (Total)** | **$3,068** | **$7,523** | **$10,591** | **40.6%** | **48.3%** | **$385** | **$402** | **$787** | **1.1%** | **3.6%** |
| Atmospheric Sc. And Meteorology | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% |
| Geological and Earth Sciences | $0 | $0 | $0 | 0.0% | 0.0% | $385 | $402 | $787 | 1.1% | 11.5% |
| Ocean Sciences and Marine Sciences | $3,068 | $7,523 | $10,591 | 40.6% | 70.1% | $0 | $0 | $0 | 0.0% | 0.0% |
| Other Geo/Atmosp./Ocean Sciences | | | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% |
| **Mathematics and Statistics (Total)** | **$282** | **$564** | **$846** | **3.2%** | **20.9%** | **$147** | **$482** | **$629** | **0.9%** | **15.5%** |
| **Computer Sciences (Total)** | **$113** | **$488** | **$601** | **2.3%** | **2.0%** | **$3,008** | **$3,450** | **$6,458** | **9.3%** | **21.2%** |
| **Life Sciences (Total)** | **$844** | **$1,373** | **$2,217** | **8.5%** | **0.6%** | **$7,224** | **$6,668** | **$13,892** | **19.9%** | **3.5%** |
| Agricultural | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% |
| Biological and Biomedical Sciences | $844 | $1,230 | $2,074 | 7.9% | 1.8% | $2,378 | $1,042 | $3,420 | 4.9% | 3.0% |
| Health Sciences | $0 | $143 | $143 | 0.5% | 0.0% | $0 | $19 | $19 | 0.0% | 0.0% |
| Natural Resources and Conservation | $0 | $0 | $0 | 0.0% | | $0 | $0 | $0 | 0.0% | 0.0% |
| Other Life Sciences | $0 | $0 | $0 | 0.0% | 0.0% | $4,846 | $5,607 | $10,453 | 15.0% | 8.9% |
| **Psychology (Total)** | **$0** | **$344** | **$344** | **1.3%** | **3.1%** | **$170** | **$890** | **$1,060** | **1.5%** | **9.6%** |
| **Social Sciences (Total)** | **$8** | **$846** | **$854** | **3.3%** | **3.9%** | **$1,312** | **$2,750** | **$4,062** | **5.8%** | **18.6%** |
| Anthropology | $0 | $12 | $12 | 0.0% | 0.5% | $0 | $0 | $0 | 0.0% | 0.0% |
| Economics | $0 | $149 | $149 | 0.6% | 6.8% | $0 | $367 | $367 | 0.5% | 16.7% |
| Political Science and Government | $0 | $6 | $6 | 0.0% | 0.1% | $0 | $402 | $402 | 0.6% | 6.9% |
| Sociology, Demography, Popn. Studies | $8 | $93 | $101 | 0.4% | 2.1% | $173 | $338 | $511 | 0.7% | 10.6% |
| Other Social Sciences | $0 | $586 | $586 | 2.2% | 8.6% | $1,139 | $1,643 | $2,782 | 4.0% | 41.1% |
| **Other Sciences (Total)** | **$0** | **$0** | **$0** | **0.0%** | **0.0%** | **$0** | **$0** | **$0** | **0.0%** | **0.0%** |
| **TOTAL, SCI & ENG FIELDS** | **$7,118** | **$17,218** | **$24,336** | **93.2%** | **4.0%** | **$28,078** | **$32,657** | **$60,735** | **87.2%** | **10.0%** |
| **FIELD** | **Federal** | **Non-Federal** | **UMD Total** | **% of UMD Total** | **% of Field** | **Federal** | **Non-Federal** | **UML Total** | **% of UML Total** | **% of Field** |
| Business Mgmt. & Business Admn. | $0 | $233 | $233 | 0.9% | 5.0% | $0 | $642 | $642 | 0.9% | 13.7% |
| Comm., and Comm. Technologies | $201 | $0 | $201 | 0.8% | 30.0% | $0 | $0 | $0 | 0.0% | 0.0% |
| Education | $0 | $590 | $590 | 2.3% | 1.4% | $558 | $620 | $1,178 | 1.7% | 2.8% |
| Humanities | $51 | $565 | $616 | 2.4% | 17.2% | $1 | $1,020 | $1,021 | 1.5% | 28.4% |
| Law | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% |
| Social Work | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% |
| Visual and Performing Arts | $0 | $27 | $27 | 0.1% | 1.6% | $0 | $720 | $720 | 1.0% | 41.5% |
| Other Non-Science and Engin. | $0 | $99 | $99 | 0.4% | 1.2% | $834 | $4,547 | $5,381 | 7.7% | 67.3% |
| **TOTAL, NON-SCI & ENG FIELDS** | **$252** | **$1,514** | **$1,766** | **6.8%** | **2.9%** | **$1,393** | **$7,549** | **$8,942** | **12.8%** | **14.7%** |
| **TOTAL, SCI & ENG FIELDS** | **$7,118** | **$17,218** | **$24,336** | **93.2%** | **4.0%** | **$28,078** | **$32,657** | **$60,735** | **87.2%** | **10.0%** |
| **GRAND TOTAL** | **$7,370** | **$18,732** | **$26,102** | **100.0%** | **3.9%** | **$29,471** | **$40,206** | **$69,677** | **100.0%** | **10.4%** |

**Source: Campus NSF HERD Surveys. All dollars are in thousands.**

*Note: Percent of Total is the percent each field represents of total campus or system R&D expenditures in all fields.*
*Percent of Field is the percent of the UMass system's expenditures in a particular field represented by that campus.*

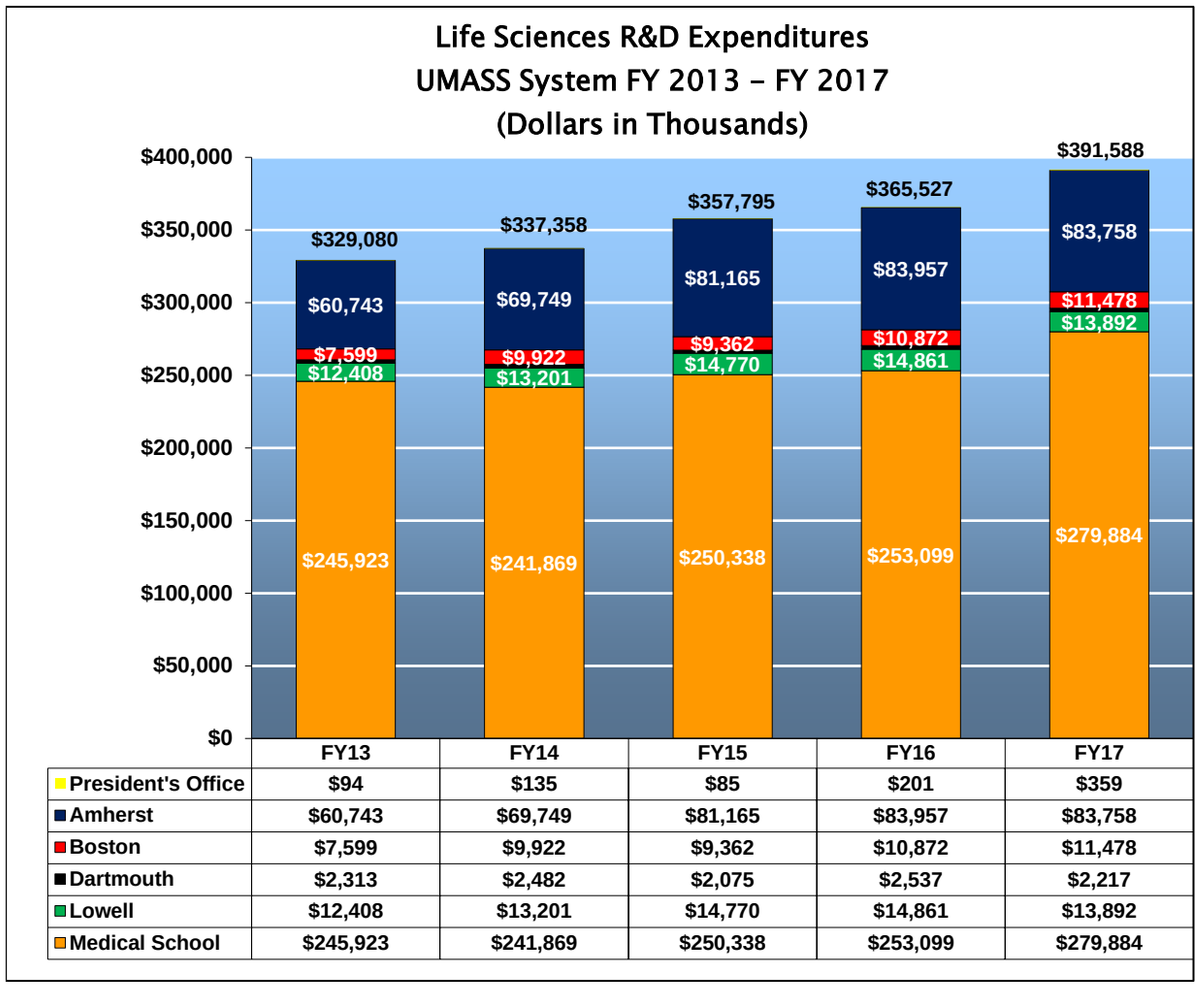
# FY 2017 Total R&D Expenditures by Field (Federal and Non-Federal)

| FIELD | UMMS Federal | UMMS Non-Federal | UMMS Total | UMMS % of UMMS Total | UMMS % of Field | UMPO Federal | UMPO Non-Federal | UMPO Total | UMPO % of UMPO Total | UMPO % of Field | UMass System Federal | UMass System Non-Federal | UMass System System Total | UMass System % of System |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Engineering (Total)** | **$0** | **$0** | **$0** | **0.0%** | **0.0%** | **$10** | **$1** | **$11** | **0.3%** | **0.0%** | **$38,044** | **$45,322** | **$83,366** | **12.4%** |
| Aerosp., Aeronaut., Astronaut. Engg. | $0 | $0 | $0 | **0.0%** | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% |
| Bioengineering/Biomedical | $0 | $0 | $0 | **0.0%** | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $110 | $702 | $812 | 0.1% |
| Chemical | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $12,096 | $12,083 | $24,179 | 3.6% |
| Civil | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $6,366 | $13,580 | $19,946 | 3.0% |
| Electrical | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $12,026 | $10,590 | $22,616 | 3.4% |
| Industrial and Manufacturing | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% |
| Mechanical | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $6,776 | $7,184 | $13,960 | 2.1% |
| Metallurgical & Materials | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $1 | $1 | 0.0% |
| Other | $0 | $0 | $0 | 0.0% | 0.0% | $10 | $1 | $11 | 0.3% | 0.6% | $670 | $1,182 | $1,852 | 0.3% |
| **Physical Sciences (Total)** | **$0** | **$0** | **$0** | **0.0%** | **0.0%** | **$0** | **$0** | **$0** | **0.0%** | **0.0%** | **$23,471** | **$15,317** | **$38,788** | **5.8%** |
| Astronomy and Astrophysics | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $2,689 | $831 | $3,520 | 0.5% |
| Chemistry | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $8,633 | $7,278 | $15,911 | 2.4% |
| Materials Science | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% |
| Physics | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $12,149 | $7,208 | $19,357 | 2.9% |
| Other Physical Sciences | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% |
| **Geo/Atmosp./Ocean Sciences (Total)** | **$0** | **$0** | **$0** | **0.0%** | **0.0%** | **$0** | **$0** | **$0** | **0.0%** | **0.0%** | **$9,713** | **$12,218** | **$21,931** | **3.3%** |
| Atmospheric Sc. And Meteorology | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% |
| Geological and Earth Sciences | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $4,764 | $2,053 | $6,817 | 1.0% |
| Ocean Sciences and Marine Sciences | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $4,949 | $10,165 | $15,114 | 2.3% |
| Other Geo/Atmosp./Ocean Sciences | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% |
| **Mathematics and Statistics (Total)** | **$0** | **$0** | **$0** | **0.0%** | **0.0%** | **$0** | **$0** | **$0** | **0.0%** | **0.0%** | **$2,155** | **$1,900** | **$4,055** | **0.6%** |
| **Computer Sciences (Total)** | **$0** | **$0** | **$0** | **0.0%** | **0.0%** | **$0** | **$12** | **$12** | **0.3%** | **0.0%** | **$19,504** | **$11,001** | **$30,505** | **4.6%** |
| **Life Sciences (Total)** | **$200,232** | **$79,652** | **$279,884** | **100.0%** | **71.5%** | **$267** | **$92** | **$359** | **8.2%** | **0.1%** | **$247,689** | **$143,899** | **$391,588** | **58.4%** |
| Agricultural | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $6,221 | $5,797 | $12,018 | 1.8% |
| Biological and Biomedical Sciences | $60,409 | $25,471 | $85,880 | 30.7% | 74.9% | $0 | $0 | $0 | 0.0% | 0.0% | $77,760 | $36,907 | $114,667 | 17.1% |
| Health Sciences | $75,092 | $34,122 | $109,214 | 39.0% | 78.8% | $267 | $92 | $359 | 8.2% | 0.3% | $89,108 | $49,514 | $138,622 | 20.7% |
| Natural Resources and Conservation | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $4,720 | $3,711 | $8,431 | 1.3% |
| Other Life Sciences | $64,731 | $20,059 | $84,790 | 30.3% | 71.9% | $0 | $0 | $0 | 0.0% | 0.0% | $69,880 | $47,970 | $117,850 | 17.6% |
| **Psychology (Total)** | **$0** | **$0** | **$0** | **0.0%** | **0.0%** | **$0** | **$0** | **$0** | **0.0%** | **0.0%** | **$5,821** | **$5,202** | **$11,023** | **1.6%** |
| **Social Sciences (Total)** | **$0** | **$0** | **$0** | **0.0%** | **0.0%** | **$107** | **$1,370** | **$1,477** | **33.6%** | **6.7%** | **$5,462** | **$16,427** | **$21,889** | **3.3%** |
| Anthropology | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $1,022 | $1,223 | $2,245 | 0.3% |
| Economics | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $567 | $567 | 12.9% | 25.7% | $302 | $1,902 | $2,204 | 0.3% |
| Political Science and Government | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $359 | $5,465 | $5,824 | 0.9% |
| Sociology, Demography, Popn. Studies | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $603 | $603 | 13.7% | 12.5% | $1,683 | $3,157 | $4,840 | 0.7% |
| Other Social Sciences | $0 | $0 | $0 | 0.0% | 0.0% | $107 | $200 | $307 | 7.0% | 4.5% | $2,096 | $4,680 | $6,776 | 1.0% |
| **Other Sciences (Total)** | **$0** | **$0** | **$0** | **0.0%** | **0.0%** | **$18** | **$1,017** | **$1,035** | **23.6%** | **16.8%** | **$2,271** | **$3,893** | **$6,164** | **0.9%** |
| **TOTAL, SCI & ENG FIELDS** | **$200,232** | **$79,652** | **$279,884** | **100.0%** | **45.9%** | **$402** | **$2,492** | **$2,894** | **65.9%** | **0.5%** | **$354,130** | **$255,179** | **$609,309** | **90.9%** |

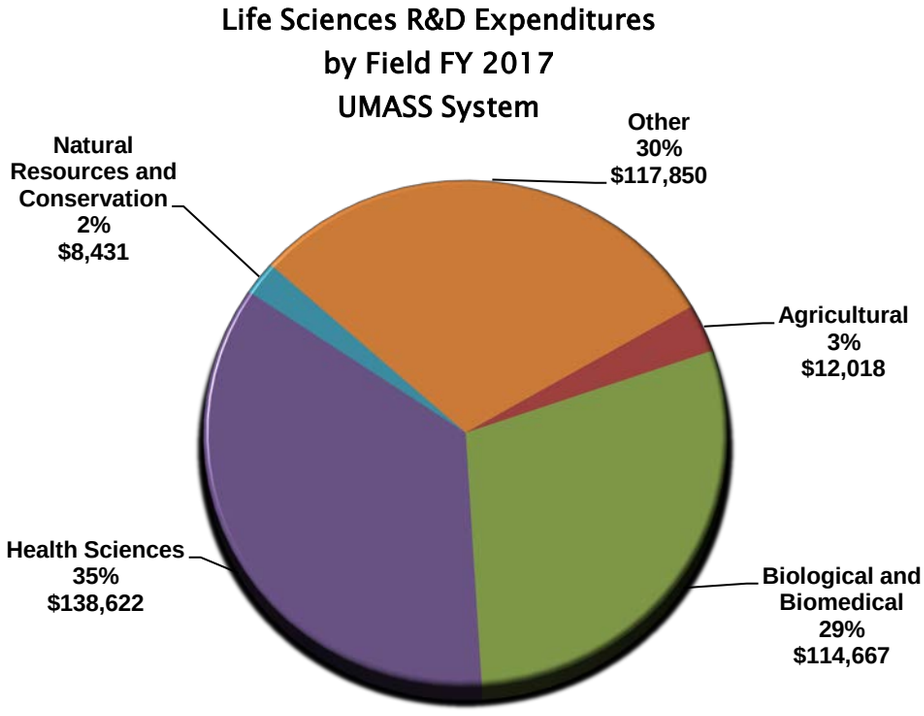
| FIELD | UMW Federal | UMW Non-Federal | UMW Total | UMW % of UMW Total | UMW % of Field | UMPO Federal | UMPO Non-Federal | UMPO Total | UMPO % of UMPO Total | UMPO % of Field | UMass System Federal | UMass System Non-Federal | UMass System UMass Total | UMass System % of Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Business Mgmt. & Business Admn. | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $271 | $4,422 | $4,693 | 0.7% |
| Comm., and Comm. Technologies | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $201 | $469 | $670 | 0.1% |
| Education | $0 | $0 | $0 | 0.0% | 0.0% | $319 | $968 | $1,287 | 29.3% | 3.1% | $20,872 | $20,901 | $41,773 | 6.2% |
| Humanities | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $169 | $3,421 | $3,590 | 0.5% |
| Law | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% |
| Social Work | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $81 | $81 | 0.0% | 0.0% | $19 | $207 | $226 | 0.0% |
| Visual and Performing Arts | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $0 | $0 | 0.0% | 0.0% | $83 | $1,653 | $1,736 | 0.3% |
| Other Non-Science and Engin. | $0 | $0 | $0 | 0.0% | 0.0% | $0 | $132 | $132 | 3.0% | 1.7% | $854 | $7,142 | $7,996 | 1.2% |
| **TOTAL, NON-SCI & ENG FIELDS** | **$0** | **$0** | **$0** | **0.0%** | **0.0%** | **$319** | **$1,181** | **$1,500** | **34.1%** | **2.5%** | **$22,469** | **$38,215** | **$60,684** | **9.1%** |
| **TOTAL, SCI & ENG FIELDS** | **$200,232** | **$79,652** | **$279,884** | **100.0%** | **45.9%** | **$402** | **$2,492** | **$2,894** | **65.9%** | **0.5%** | **$354,130** | **$255,179** | **$609,309** | **90.9%** |
| **GRAND TOTAL** | **$200,232** | **$79,652** | **$279,884** | **100.0%** | **41.8%** | **$721** | **$3,673** | **$4,394** | **100.0%** | **0.7%** | **$376,599** | **$293,394** | **$669,993** | **100.0%** |

**Source: Campus NSF HERD Surveys. All dollars are in thousands.**

*Note: Percent of Total is the percent each field represents of total campus or system R&D expenditures in all fields.*
*Percent of Field is the percent of the UMass system's expenditures in a particular field represented by that campus.*




| | FY13 | FY14 | FY15 | FY16 | FY17 |
|---|---|---|---|---|---|
| President's Office | $94 | $135 | $85 | $201 | $359 |
| Amherst | $60,743 | $69,749 | $81,165 | $83,957 | $83,758 |
| Boston | $7,599 | $9,922 | $9,362 | $10,872 | $11,478 |
| Dartmouth | $2,313 | $2,482 | $2,075 | $2,537 | $2,217 |
| Lowell | $12,408 | $13,201 | $14,770 | $14,861 | $13,892 |
| Medical School | $245,923 | $241,869 | $250,338 | $253,099 | $279,884 |




*Source: Campus NSF surveys. All dollars are in thousands.*

## Life Sciences R&D Expenditures by Field
## Trend Data

*(Dollars in Thousands)*

| | Total Life Sciences R&D (FY 2013-FY 2017) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | FY13 | FY14 | FY15 | FY16 | FY17 | 5-Year Change FY13 - FY17 | | 1-Year Change FY16-FY17 | |
| | | | | | | $ | % | $ | % |
| Amherst | $60,743 | $69,749 | $81,165 | $83,957 | $83,758 | $23,015 | 38% | -$199 | 0% |
| Boston | $7,599 | $9,922 | $9,362 | $10,872 | $11,478 | $3,879 | 51% | $606 | 6% |
| Dartmouth | $2,313 | $2,482 | $2,075 | $2,537 | $2,217 | -$96 | -4% | -$320 | -13% |
| Lowell | $12,408 | $13,201 | $14,770 | $14,861 | $13,892 | $1,484 | 12% | -$969 | -7% |
| Medical School | $245,923 | $241,869 | $250,338 | $253,099 | $279,884 | $33,961 | 14% | $26,785 | 11% |
| President's Office | $94 | $135 | $85 | $201 | $359 | $265 | 282% | $158 | 79% |
| **System** | **$329,080** | **$337,358** | **$357,795** | **$365,527** | **$391,588** | **$62,508** | **19%** | **$26,061** | **7%** |

| | Agricultural (FY 2016-FY 2017)* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | FY13 | FY14 | FY15 | FY16 | FY17 | 5-Year Change FY13 - FY17 | | 1-Year Change FY16-FY17 | |
| | | | | | | $ | % | $ | % |
| Amherst | | | | $12,497 | $12,018 | | | -$479 | -4% |
| Boston | | | | $0 | $0 | | | $0 | NA |
| Dartmouth | | | | $0 | $0 | | | $0 | NA |
| Lowell | | | | $0 | $0 | | | $0 | NA |
| Medical School | | | | $0 | $0 | | | $0 | NA |
| President's Office | | | | $0 | $0 | | | $0 | NA |
| **System** | | | | **$12,497** | **$12,018** | | | **-$479** | **-4%** |

| | Biological and Biomedical Sciences (FY 2016-FY 2017)* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | FY13 | FY14 | FY15 | FY16 | FY17 | 5-Year Change FY13 - FY17 | | 1-Year Change FY16-FY17 | |
| | | | | | | $ | % | $ | % |
| Amherst | | | | $22,306 | $20,051 | | | -$2,255 | -10% |
| Boston | | | | $3,226 | $914 | | | -$2,312 | -72% |
| Dartmouth | | | | $2,217 | $2,074 | | | -$143 | -6% |
| Lowell | | | | $1,633 | $3,420 | | | $1,787 | 109% |
| Medical School | | | | $79,471 | $85,880 | | | $6,409 | 8% |
| President's Office | | | | $0 | $0 | | | $0 | NA |
| **System** | | | | **$108,853** | **$112,339** | | | **$3,486** | **3%** |

***Please Note: Historical trend data in the Life Sciences sub-fields is only available for FY16-FY17, since the sub-fields were reclassified in the FY16 HERD surveys, and any data prior to FY16 at this lewvel will not be comparable.***

## Life Sciences R&D Expenditures by Field
## Trend Data

*(Dollars in Thousands)*

| Health Sciences (FY 2016-FY 2017)* | FY13 | FY14 | FY15 | FY16 | FY17 | 5-Year Change FY13 - FY17 | | 1-Year Change FY16-FY17 | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $ | % | $ | % |
| **Amherst** | | | | $18,693 | $20,827 | | | $2,134 | 11% |
| **Boston** | | | | $7,447 | $8,060 | | | $613 | 8% |
| **Dartmouth** | | | | $320 | $143 | | | -$177 | -55% |
| **Lowell** | | | | $240 | $19 | | | -$221 | -92% |
| **Medical School** | | | | $107,202 | $109,214 | | | $2,012 | 2% |
| **President's Office** | | | | $85 | $359 | | | $274 | 322% |
| **System** | | | | **$133,987** | **$138,622** | | | **$4,635** | **3%** |

| Natural Resources and Conservation (FY 2016-FY 2017)* | FY13 | FY14 | FY15 | FY16 | FY17 | 5-Year Change FY13 - FY17 | | 1-Year Change FY16-FY17 | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $ | % | $ | % |
| **Amherst** | | | | $11,088 | $8,428 | | | -$2,660 | -24% |
| **Boston** | | | | $112 | $3 | | | -$109 | -97% |
| **Dartmouth** | | | | $0 | $0 | | | $0 | NA |
| **Lowell** | | | | $0 | $0 | | | $0 | NA |
| **Medical School** | | | | $0 | $0 | | | $0 | NA |
| **President's Office** | | | | $0 | $0 | | | $0 | NA |
| **System** | | | | **$11,200** | **$8,431** | | | **-$2,769** | **-25%** |

| Other Life Sciences (FY 2016-FY 2017) | FY13 | FY14 | FY15 | FY16 | FY17 | 5-Year Change FY13 - FY17 | | 1-Year Change FY16-FY17 | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | $ | % | $ | % |
| **Amherst** | | | | $19,373 | $22,434 | | | $3,061 | 16% |
| **Boston** | | | | $87 | $173 | | | $86 | 99% |
| **Dartmouth** | | | | $0 | $0 | | | $0 | NA |
| **Lowell** | | | | $12,988 | $10,453 | | | -$2,535 | -20% |
| **Medical School** | | | | $ 66,426 | $ 84,790 | | | $18,364 | 28% |
| **President's Office** | | | | $116 | $0 | | | -$116 | -100% |
| **System** | | | | **$98,990** | **$117,850** | | | **$18,860** | **19%** |

*Source: Campus NSF surveys and WebCASPAR. All dollars are in thousands.*

***Please Note: Historical trend data in the Life Sciences sub-fields is only available for FY16-FY17, since the sub-fields were reclassified in the FY16 HERD surveys, and any data prior to FY16 at this lewvel will not be comparable.***

# TECHNICAL NOTE

The *FY 2017 Annual Research and Development Expenditures Report* presents information on the research and development expenditures for the University of Massachusetts System.

**The NSF Survey Definition for Research and development (R&D)** is R&D is creative and systematic work undertaken in order to increase the stock of knowledge - including knowledge of humankind, culture, and society - and to devise new applications of available knowledge. R&D covers three activities defined below - basic research, applied research, and experimental development.

- Basic research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view.
- Applied research is original investigation undertaken in order to acquire new knowledge. It is directed primarily towards a specific, practical aim or objective.
- Experimental development is systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products or processes or to improving existing products or processes.

***R&D Expenditures – (What to Include) -*** For purposes of the HERD survey, R&D includes expenditures for organized research as defined by 2 CFR 200 Appendix III and expenditures from funds designated for research.

| R&D ***includes:*** | R&D does ***not*** include: |
|---|---|
| • Sponsored research (federal and nonfederal)<br>• University research (institutional funds that are separately budgeted for individual R&D projects)<br>• Startup, bridge, or seed funding provided to researchers within your institution<br>• Other departmental funds designated for research<br>• Recovered and unrecovered indirect costs (see definitions in Question 1)<br>• Equipment purchased from R&D project accounts<br>• R&D funds passed through to a sub-recipient organization, educational or other<br>• Clinical trials, Phases I, II, or III (see definition in Question 5)<br>• Research training grants funding work on organized research projects<br>• Tuition remission provided to students working on research | • Public service grants or outreach programs<br>• Curriculum development (unless included as part of an overall research project)<br>• R&D conducted by university faculty or staff at outside institutions that is not accounted for in your financial records<br>• Estimates of the proportion of time budgeted for instruction that is spent on research<br>• Capital projects (i.e., construction or renovation of research facilities)<br>• Non-research training grants<br>• Unrecovered indirect costs that exceed your institution's federally negotiated Facilities and Administrative (F&A) rate |

*Source: FY 2017 HERD Survey*

**Changes to Questions in the FY 2017 HERD Survey:**

- **Questions 1, 7, and 9**: Instructions were updated to clarify that funding from Federally Funded Research and Development Centers (FFRDCs) should be treated as direct federal funding from the sponsoring agency.

- **Questions 1 and 12:** The confidentiality statement on Questions 1 and 12 was revised. The new text is in italics:

  Information from confidential items is not published or released for individual institutions; only aggregate totals will appear in publications. In accordance with the National Science Foundation Act of 1950, as amended, and other applicable federal laws, your responses will not be disclosed in identifiable form to anyone other than agency employees or authorized persons. *Per the Federal Cybersecurity Enhancement Act of 2015, your data are protected from cybersecurity risks through screening of the federal information systems that transmit your data.*

- **Questions 7 and 8:** Row d instructions were updated to clarify that foreign universities and colleges should be reported on row d.

Please see "Reference Materials" on the survey website for additional information about which disciplines have been reclassified under different fields.

Additional highlights as well as rankings and comparative data can be found in the expanded version of this report (to be released shortly). Please contact us at the University of Massachusetts President's Office, Office of Institutional Research, if you would like to obtain a hard copy.

Neena Verma
Director of Institutional Research