

**Status on FY 2004 Research Funding
at the University of Missouri**

Randy Sade
Assistant Research Analyst

IR&P 2006, Report 6

August 2006

Institutional Research and Planning
University of Missouri System

<http://www.umsystem.edu/ums/departments/fa/planning/>

Executive Summary

This report highlights research funding at the University of Missouri using data provided by the National Science Foundation (NSF). More specifically, it examines research funding at the public AAU institutions and at the four campuses of the University of Missouri.

Data used in this study are from fiscal year 2004. Although more recent data are available for the University of Missouri, this is the most recent data available for all public AAU institutions. References to the “University of Missouri” or the “University” refer to the four-campus system. In this report trends in research funding have been examined from at least five years up to and including FY 2004.

The key findings include:

Federal Research Expenditures

Total federal research expenditures at the University of Missouri have increased 50% since FY 2000. This compares to an average increase of 51% at the public AAU institutions. (Table 1)

Overall, the market share for the University of Missouri among the public AAU institutions has not changed, showing a slight decrease from 1.57 in FY 2000 to 1.56 in FY 2004. (Table 2)

In terms of federal research expenditures, the University of Missouri placed 27th among the 34 public AAU institutions in FY 2004. This is an improvement over its FY 2000 position (28th). (Table 3).

In FY 2004, life sciences was the discipline where most of the public AAU universities made the highest percentage of their federal research expenditures. UM-Columbia spent 75% of its federal research expenditures in life sciences. (Table 4)

Industry-Sponsored Research Expenditures

Organization

The report has been organized into the following sections:

| | |
|--------------|--|
| Section I: | Federal Research Expenditures (Tables 1–5 and Figure 1) |
| Section II: | Research Expenditures from Industry (Table 6 and Figure 2) |
| Section III: | Research Expenditures by Source of Funds (Table 7) |
| Section IV: | Definitions and Technical Notes |

SECTION I FEDERAL RESEARCH EXPENDITURES

The federal research expenditures reported in this section include expenditures classified as science and engineering research and development (R&D) funds. When trend data are examined, increases or decreases in funding are noted from various fiscal years as early as 1995 to 2004. In addition, a definition of *federal research expenditures* is provided in Section IV: Definitions and Technical Notes.

Federal Flow-Through Expenditures

Beginning in FY 1996, federal research expenditures for the University of Missouri include federal flow-through expenditures. Originating from a federal agency, these expenditures have been awarded to industry, state agencies in Missouri, foundations, or another college or university and then passed on to the University of Missouri. The University has typically classified these expenditures based on the intermediary (i.e., industry, etc.). In FY 1996, however, the University of Missouri began classifying these expenditures based on their original source, the federal government. Consequently, the increase in federal research expenditures in fiscal years 1996 to 2004 for the University of Missouri can be partially attributed to this NSF-accepted classification method.

Please note that annual totals in research expenditures for FY 1996 and FY 1997 were retroactively changed in 1999. Consequently, these revised totals will not match previously published figures for these two fiscal years.

Table 1:

Public AAU Institutions: Trends in Federal Expenditures for Science and Engineering R&D

Table 1 shows the trend in federal research expenditures for the public AAU institutions and the four campuses of the University of Missouri. Percentage increases in funds are displayed for fiscal year 2000.

Total federal research expenditures at the University of Missouri have increased 50% since FY 2000. This compares to an average increase of 51% at the public AAU institutions.

Since FY 2000, UM-Kansas City federal research expenditures had a 110% increase and UM-Rolla increased their original 106%.

Table 1. Trends in Federal Expenditures for Science and Engineering R&D at Public AAU Institutions for FY 1995, FY 2000-2004

| Institution | (\$ in thousands) | | | | | | change since FY00 |
|----------------------------------|-------------------|---------|---------|---------|---------|---------|-------------------|
| | FY95 | FY00 | FY01 | FY02 | FY03 | FY04 | |
| Ohio State U. | 122,660 | 132,219 | 161,092 | 177,883 | 198,488 | 284,675 | 115% |
| U. of Nebraska (all campuses) | 50,272 | 60,161 | 69,232 | 82,728 | 96,627 | 115,833 | 93% |
| U. of Florida | 79,361 | 120,374 | 139,744 | 167,108 | 194,958 | 221,898 | 84% |
| U. of Pittsburgh | 144,487 | 228,155 | 268,571 | 306,913 | 345,625 | 394,444 | 73% |
| U. of California-Irvine | 69,655 | 88,274 | 101,735 | 115,548 | 133,873 | 150,995 | 71% |
| U. of California-Los Angeles | 201,773 | 274,162 | 312,858 | 366,762 | 421,174 | 461,145 | 68% |
| Rutgers, State U. of New Jersey | 72,567 | 79,711 | 77,156 | 91,205 | 106,060 | 128,655 | 61% |
| U. of Washington | 291,284 | 389,622 | 435,103 | 487,059 | 565,602 | 625,218 | 60% |
| U. of Virginia | 85,244 | 119,243 | 122,868 | 152,358 | 173,442 | 188,121 | 58% |
| Purdue U. | 93,256 | 92,010 | 98,151 | 107,477 | 129,199 | 144,090 | 57% |
| U. of California-Davis | 122,645 | 141,740 | 154,937 | 176,644 | 208,327 | 221,937 | 57% |
| U. of North Carolina-Chapel Hill | 156,626 | 194,794 | 221,615 | 254,571 | 280,678 | 304,204 | 56% |
| U. of Wisconsin-Madison | 229,381 | 278,629 | 304,009 | 345,003 | 396,231 | 434,423 | 56% |
| Indiana U. | 86,041 | 107,577 | 116,781 | 132,759 | 153,625 | 166,913 | 55% |
| Pennsylvania State U. | 187,481 | 226,074 | 245,951 | 284,706 | 301,094 | 347,996 | 54% |
| Iowa State U. | 58,766 | 59,976 | 62,024 | 71,419 | 82,297 | 92,235 | 54% |
| U. of Arizona | 168,791 | 187,161 | 199,484 | 211,772 | 259,074 | 283,956 | 52% |
| U. at Buffalo, SUNY | 75,713 | 96,410 | 96,595 | 128,842 | 129,794 | 143,865 | 49% |
| U. of Iowa | 103,115 | 140,764 | 155,249 | 180,743 | 197,260 | 209,865 | 49% |
| U. of Kansas | 42,209 | 68,950 | 74,494 | 82,663 | 90,876 | 101,920 | 48% |
| Michigan State U. | 77,499 | 97,112 | 112,359 | 122,595 | 133,820 | 143,473 | 48% |
| U. of Michigan | 275,956 | 364,033 | 396,117 | 444,255 | 516,818 | 521,339 | 43% |
| U. of California-San Diego | 284,445 | 326,037 | 343,276 | 359,383 | 400,100 | 465,629 | 43% |
| U. of Illinois-Urbana/Champaign | 139,078 | 193,490 | 195,316 | 214,323 | 266,487 | 275,896 | 43% |
| U. of Oregon | 23,789 | 30,793 | 32,232 | 37,177 | 36,127 | 43,634 | 42% |
| U. of Colorado (all campuses) | 169,666 | 300,394 | 308,643 | 340,466 | 377,941 | 414,986 | 38% |
| U. of Minnesota (all campuses) | 194,819 | 229,958 | 264,289 | 295,301 | 293,266 | 308,369 | 34% |
| U. of Maryland-College Park | 94,071 | 136,605 | 145,515 | 194,095 | 183,206 | 180,943 | 32% |
| U. of Texas-Austin | 143,939 | 178,889 | 195,184 | 219,158 | 231,996 | 235,281 | 32% |
| U. of California-Berkeley | 157,826 | 208,338 | 208,080 | 217,297 | 238,206 | 268,830 | 29% |
| Stony Brook U., SUNY | 76,505 | 96,641 | 93,265 | 108,122 | 112,452 | 123,124 | 27% |
| Texas A&M U. | 136,734 | 149,639 | 149,382 | 163,488 | 177,119 | 173,705 | 16% |
| U. of California-Santa Barbara | 63,443 | 80,754 | 76,828 | 78,370 | 88,422 | 92,248 | 14% |
| Public AAU Institution Average* | 129,670 | 166,021 | 179,943 | 203,582 | 227,887 | 250,601 | 51% |
| University of Missouri:** | | | | | | | |
| Columbia | 32,420 | 65,420 | 68,435 | 77,742 | 84,211 | 90,304 | 38% |
| Kansas City | 4,506 | 7,490 | 8,176 | 10,795 | 14,232 | 15,696 | 110% |
| Rolla | 5,834 | 9,804 | 11,929 | 15,749 | 18,142 | 20,218 | 106% |
| St Louis | 2,840 | 4,523 | 4,321 | 4,755 | 4,978 | 4,618 | 2% |
| University Total | 45,600 | 87,237 | 92,861 | 109,041 | 121,563 | 130,836 | 50% |

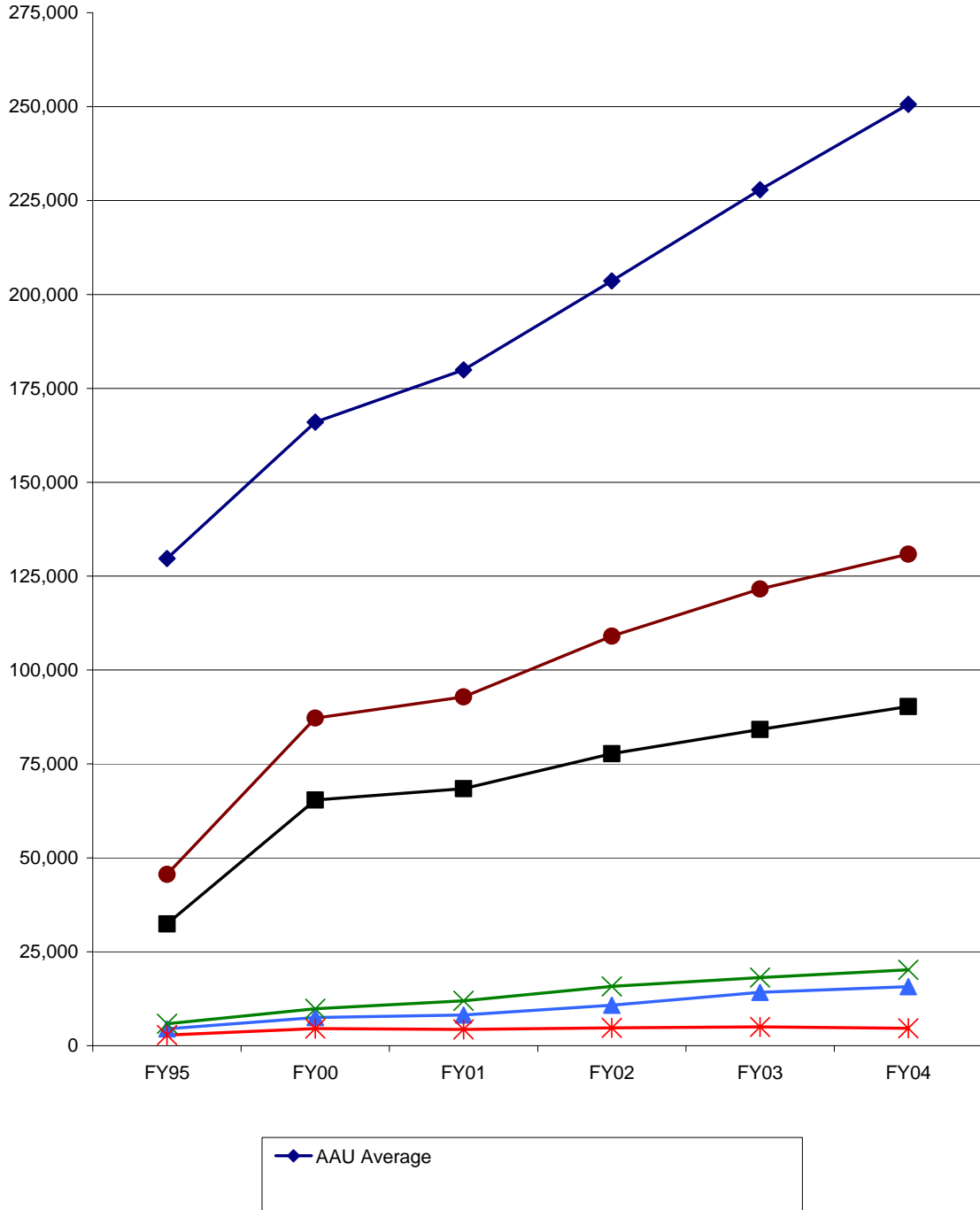
Source: National Science Foundation/Division of Science Resources Statistics, Academic Research & Development Expenditures, FY 2004, Table 24

*AAU average excludes University of Missouri-Columbia

**Federal flow-through funds are included in the University of Missouri figures beginning in FY 1996

If comparing data from this table with previous published tables, please notice that Texas A&M University and SUNY at Stony Brook were new members of the AAU with the 2000 data and are included for the first time that year.

Figure 1. Trends in Federal Expenditures for Science and Engineering R & D at Public AAU Institutions for FY 1995, FY 2000-2004 (\$ in thousands)



***Table 2:
Public AAU Institutions: Market Share Increases and Decreases in Federal Expenditures for Science
and Engineering R&D***

An alternative approach to understanding how well the University of Missouri has "competed" with other public AAU institutions is to examine the market share of each institution over time. That is, of the total federal research expenditures secured by the public AAU institutions in a given year, what percentage of that total has each institution secured? How has that institution's market share shifted from year to year? One advantage of market share analysis is that it helps to level the playing field among major and less-than-major players who compete for research dollars. In Table 2, the market share of federal research expenditures has been calculated for the public AAU institutions in fiscal years 2000 through 2004.

Overall, the market share for the University of Missouri among the public AAU institutions has not changed, showing a slight decrease from 1.57% in FY 2000 to 1.56% in FY 2004.

Most notable since FY 2000, UM-Columbia market share amongst other public AAU institutions decreased from 1.18% to 1.08%, while UM-Rolla increased from 0.18% to 0.24%.

| Institution | Market | | Market | | Market | | Market | | Market | | Market Share +/- since FY00 |
|-------------------------------|---------|-------|---------|-------|---------|-------|---------|-------|---------|-------|-----------------------------|
| | \$ | Share | \$ | Share | \$ | Share | \$ | Share | \$ | Share | |
| Ohio State U. | 132,219 | 2.38 | 161,092 | 2.67 | 177,883 | 2.61 | 198,488 | 2.60 | 284,675 | 3.39 | 1.01 |
| U. of Pittsburgh | 228,155 | 4.10 | 268,571 | 4.45 | 306,913 | 4.50 | 345,625 | 4.52 | 394,444 | 4.70 | 0.60 |
| U. of California-Los Angeles | 274,162 | 4.93 | 312,858 | 5.19 | 366,762 | 5.37 | 421,174 | 5.51 | 461,145 | 5.49 | 0.56 |
| U. of Florida | 120,374 | 2.16 | 139,744 | 2.32 | 167,108 | 2.45 | 194,958 | 2.55 | 221,898 | 2.64 | 0.48 |
| U. of Washington | 389,622 | 7.00 | 435,103 | 7.21 | 487,059 | 7.13 | 565,602 | 7.40 | 625,218 | 7.44 | 0.44 |
| U. of Nebraska (all campuses) | 60,161 | 1.08 | 69,232 | 1.15 | 82,728 | 1.21 | 96,627 | 1.26 | 115,833 | 1.38 | 0.30 |

***Table 3:
Public AAU Institutions: The University of Missouri's Rank in Federal Expenditures for Science and Engineering R&D***

Table 3 ranks the public AAU institutions in terms of federal research dollars secured in fiscal years 2000 and 2004.

The University of Missouri placed 27th among the 34 public AAU institutions in FY 2004. This is an improvement over its FY 2000 position (28th).

Between FY 2000 and FY 2004, UM-Columbia dropped in its public AAU ranking from 31st to 33rd.

| FY 2000 | | | FY 2004 | | |
|---------|--------------------------------|---------|---------|-------------------------------|--|
| Rank | Institution | \$ | Rank | Institution | \$ |
| 1 | U. of Washington | 389,622 | 1 | U. of Washington | 625,218 |
| 2 | U. of Michigan | 364,033 | 2 | U. of Michigan | 521,339 |
| 3 | U. of California-San Diego | 326,037 | 3 | U. of California-San Diego | 465,629 |
| 4 | U. of Colorado (all campuses) | 300,394 | 4 | U. of California-Los Angeles | 461,145 |
| 5 | U. of Wisconsin-Madison | 278,629 | 5 | U. of Wisconsin-Madison | 434,423 |
| 6 | U. of California-Los Angeles | 274,162 | 6 | U. of Colorado (all campuses) | 414,986 |
| 7 | U. of Minnesota (all campuses) | 229,958 | 7 | U. of Pittsburgh | 394,444 |
| 8 | U. of Pittsburgh | 228,155 | 8 | Pennsylvania State U. | 347,996 |
| 9 | Pennsylvania State U. | 226,074 | 9 | U. of Minnesota (all camp | (a21T27.9(S)7(rg)37(ani)6.2(433((9447(at)15)0 T |

***Table 4:
Public AAU Institutions: Distribution of Federal Expenditures for R&D by Science and Engineering Field***

Table 4 displays the federal research expenditures by discipline area for the University of Missouri and other public AAU institutions.

In FY 2004, the average federal research funds expended by public AAU institutions were in the life sciences (57%) followed by engineering (15%), the physical sciences (11%) and environmental sciences (6%).

UM-Columbia federal research expenditures for FY 2004 were largely spent in life sciences (75%), followed by engineering (7%), and social sciences (6%).

| Institution | Engi- neering | Physical | Environ- mental | Math & computer | Life sciences | Psy- chology | Social Sciences | Sciences Nec | Total (\$ in thousands) |
|------------------------------|------------------|----------|--------------------|--------------------|------------------|-----------------|--------------------|-----------------|----------------------------|
| U. of Washington | 9 | 5 | 11 | 1 | 68 | 1 | 4 | 0 | 625,218 |
| U. of Michigan | 22 | 5 | 1 | 1 | 59 | 2 | 10 | 0 | 521,339 |
| U. of California-San Diego | 8 | 7 | 17 | 15 | 51 | 1 | 1 | 0 | 465,629 |
| U. of California-Los Angeles | 9 | 9 | 3 | 4 | 72 | 2 | 2 | 0 | 461,145 |
| U. of Wisconsin-Madison | 14 | 8 | 10 | 3 | 55 | 5 | 5 | 0 | 434,423 |
| U. of Colorson | | | | | | | | | |

***Table 5:
Public AAU Institutions: Market Share of Federal Research Expenditures by Science and Engineering
Discipline Area***

Table 5 displays each public AAU institution's market share within the eight discipline areas.

Market share leaders in each discipline area were: Pennsylvania State University in engineering (11.3%), the University of California-Berkeley in the physical sciences (8.6%), the University of California-San Diego in environmental sciences (15.3%), University of Illinois-Urbana/Champaign in math and computer science (17.5%), the University of Washington in life sciences (9.0%), University Wisconsin-Madison in psychology (11.2%), University of Michigan in the social sciences (15.5%) and University of Pittsburg in other sciences (22.9%).

UM-Columbia's most notable market shares for FY 2004 are in the fields of psychology (2.4%), social sciences (1.6%), and life sciences (1.4%).

| Institution | Engi- neering | Physical | Environ- mental | Math & computer | Life sciences | Psy- chology | Social Sciences | Other sciences | Total (\$ in thousands) |
|----------------------------------|------------------|----------|--------------------|--------------------|------------------|-----------------|--------------------|-------------------|----------------------------|
| U. of Washington | 4.9 | 3.6 | 13.8 | 1.1 | 9.0 | 4.1 | 7.7 | 0.0 | 625,218 |
| U. of Michigan | 9.5 | 3.0 | 0.9 | 1.6 | 6.5 | 4.7 | 15.5 | 0.1 | 521,339 |
| U. of California-San Diego | 3.2 | 3.6 | 15.3 | 15.2 | 5.0 | 2.9 | 1.4 | 0.0 | 465,629 |
| U. of California-Los Angeles | 3.3 | 4.9 | 2.4 | 3.8 | 7.0 | 4.4 | 2.3 | 5.7 | 461,145 |
| U. of Wisconsin-Madison | 5.0 | 4.1 | 8.3 | 3.0 | 5.0 | 11.2 | 6.1 | 0.0 | 434,423 |
| U. of Colorado (all campuses) | 2.3 | 5.9 | 15.3 | 2.0 | 4.8 | 4.2 | 2.5 | 3.8 | 414,986 |
| U. of Pittsburgh | 1.1 | 2.0 | 0.1 | 1.0 | 7.2 | 3.4 | 1.2 | 22.9 | 394,444 |
| Pennsylvania State U. | 11.3 | 4.8 | 4.3 | 7.0 | 1.9 | 5.8 | 3.1 | 4.1 | 347,996 |
| U. of Minnesota (all campuses) | 2.4 | 2.2 | 1.4 | 3.2 | 4.7 | 4.3 | 2.5 | 0.0 | 308,369 |
| U. of North Carolina-Chapel Hill | 0.0 | 1.8 | 2.5 | 1.6 | 5.0 | 2.6 | 7.5 | 0.0 | 304,204 |
| Ohio State U. | 4.0 | 2.4 | 1.4 | 2.5 | 3.5 | 2.4 | 7.3 | 3.5 | 284,675 |
| U. of Arizona | 2.6 | 8.4 | 1.4 | 1.9 | 3.2 | 1.4 | 2.8 | 0.0 | 283,956 |
| U. of Illinois-Urbana/Champaign | 5.7 | 4.0 | 3.2 | 17.5 | 1.2 | 4.3 | 1.9 | 5.8 | 275,896 |
| U. of California-Berkell | 80.0036 | 11.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |

SECTION II

RESEARCH EXPENDITURES FROM INDUSTRY

Table 6:
Public AAU Institutions: Trends in Industry-Sponsored Expenditures for Science and Engineering R&D

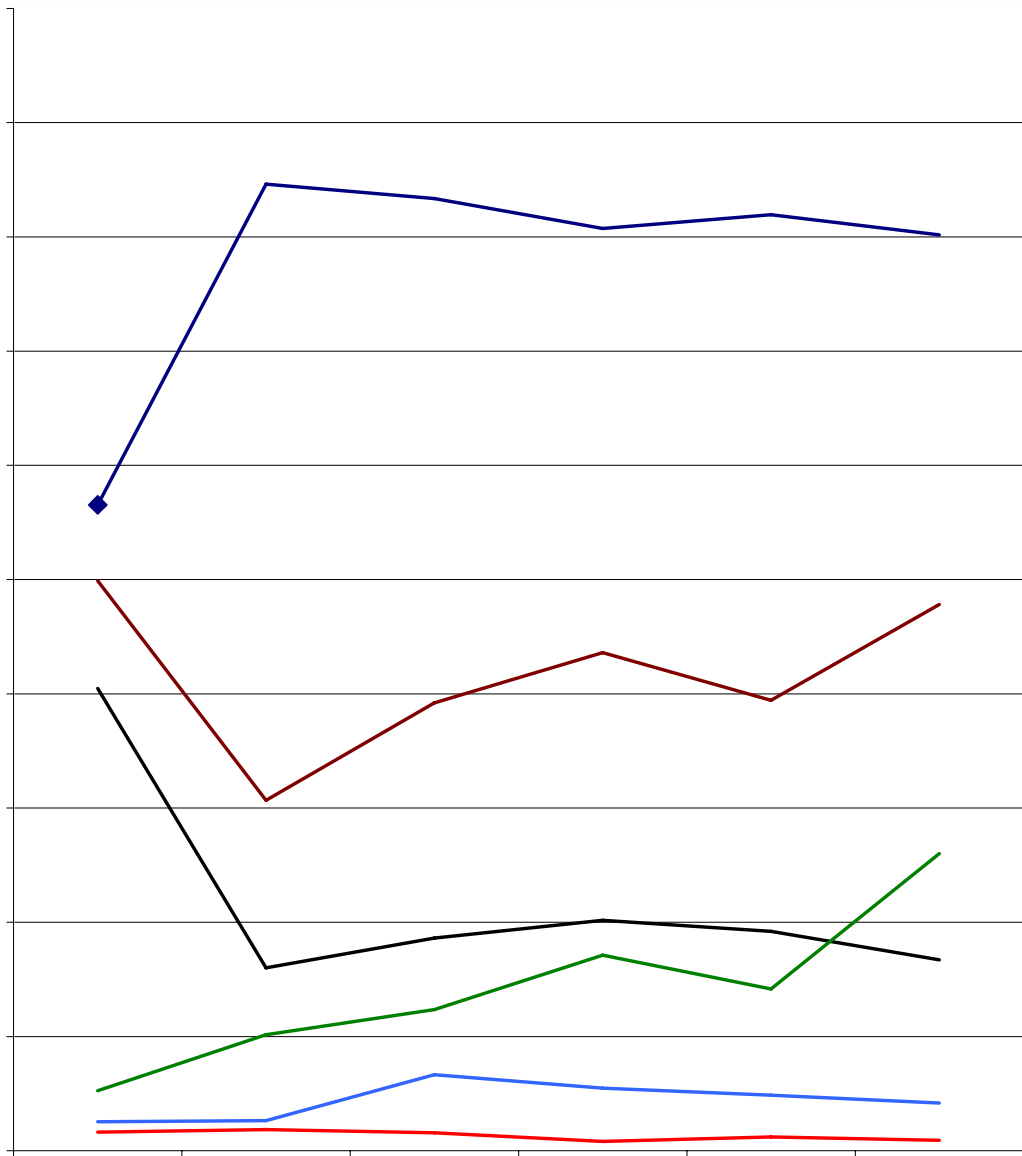
Table 6 shows the growth in industry-sponsored research expenditures for the public AAU institutions from fiscal years 1995 to 2004 and the gain or loss from FY 1995 and FY 2000. The institutions are arranged in descending order based on gain or loss since FY 2000. Please note that a definition of *industry-sponsored research expenditures* is provided in Section III: Definitions and Technical Notes.

Total industry-sponsored research expenditures at the University of Missouri have increased 56% since FY 2000. This compares to an average decrease of 5% at the public AAU institutions.

Since FY 2000, UM-Rolla industry-sponsored research expenditures had a 156% increase and UM-St. Louis decreased by 50%.

| Institution | FY95 | FY00 | FY01 | FY02 | FY03 | FY04 | change since FY00 |
|----------------------------------|--------|--------|--------|--------|--------|--------|-------------------|
| U. of Maryland-College Park | 25,431 | 1,028 | 7,315 | 5,078 | 8,060 | 9,188 | 794% |
| U. of Oregon | 391 | 237 | 155 | 68 | 247 | 549 | 132% |
| U. of California-Santa Barbara | 2,576 | 5,499 | 6,001 | 10,482 | 13,550 | 12,286 | 123% |
| U. at Buffalo, SUNY | 13,390 | 5,590 | 11,598 | 12,726 | 10,575 | 10,363 | 85% |
| Indiana U. | 5,815 | 5,384 | 6,375 | 5,312 | 8,079 | 7,939 | 47% |
| U. of California-Davis | 8,053 | 17,891 | 16,989 | 20,754 | 22,688 | 24,248 | 36% |
| Pennsylvania State U. | 50,225 | 64,393 | 67,658 | 67,131 | 77,660 | 85,570 | 33% |
| U. of Arizona | 15,300 | 22,412 | 22,934 | 23,104 | 31,079 | 29,571 | 32% |
| Purdue U. | 25,147 | 29,997 | 29,765 | 29,614 | 34,720 | 37,908 | 26% |
| U. of Nebraska (all campuses) | 7,048 | 11,552 | 11,840 | 13,982 | 14,314 | 13,471 | 17% |
| U. of Wisconsin-Madison | 12,948 | 16,127 | 17,237 | 16,746 | 15,918 | 17,911 | 11% |
| U. of Texas-Austin | 3,257 | 24,740 | 30,310 | 26,114 | 32,174 | 27,176 | 10% |
| Rutgers, State U. of New Jersey | 7,797 | 8,843 | 10,965 | 11,772 | 10,821 | 9,665 | 9% |
| U. of Colorado (all campuses) | 7,607 | 9,291 | 9,002 | 11,822 | 10,239 | 10,018 | 8% |
| U. of Illinois-Urbana/Champaign | 11,832 | 12,693 | 10,992 | 11,796 | 13,253 | 13,128 | 3% |
| Texas A&M U. | 31,452 | 31,084 | 35,110 | 33,300 | 27,006 | 32,094 | 3% |
| Iowa State U. | 8,017 | 15,075 | 13,177 | 16,047 | 14,384 | 15,056 | 0% |
| U. of North Carolina-Chapel Hill | 2,403 | 6,835 | 6,971 | 6,601 | 6,551 | 6,543 | -4% |
| U. of Michigan | 28,987 | 35,515 | 34,439 | 33,252 | 36,087 | 32,215 | -9% |
| U. of California-San Diego | 11,363 | 34,541 | 36,845 | 32,299 | 28,868 | 31,028 | -10% |
| U. of California-Los Angeles | 14,892 | 33,427 | 32,539 | 31,686 | 30,425 | 27,656 | -17% |
| U. of Minnesota (all campuses) | 23,427 | 26,392 | 26,454 | 26,572 | 24,152 | 21,832 | -17% |
| U. of California-Berkeley | 13,842 | 27,851 | 26,791 | 24,999 | 22,460 | 22,833 | -18% |
| U. of Iowa | 11,359 | 17,262 | 21,394 | 19,169 | 20,954 | 14,075 | -18% |
| U. of Washington | 36,892 | 57,405 | 43,312 | 46,702 | 48,222 | 46,531 | -19% |
| Michigan State U. | 7,853 | 11,230 | 10,953 | 11,458 | 11,307 | 8,628 | -23% |
| Ohio State U. | 21,827 | 57,075 | 54,736 | 51,135 | 45,957 | 42,763 | -25% |
| U. of California-Irvine | 9,139 | 18,615 | 15,803 | 14,261 | 11,101 | 13,391 | -23,391 |

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Section III

RESEARCH EXPENDITURES BY SOURCE OF FUNDS

Universities have sources, other than federal agencies, for funding research operations. These sources include funds from state & local agencies, business & industry, funds that are provided by the institution itself and other funding sources.

Table 7:

Public AAU Institutions: Total Expenditures for Science and Engineering R&D by Source of Funds

Table 7 shows the sources of research expenditures for the public AAU institutions. The institutions are arranged in descending order, based on the institution's percentage of research funds that are provided by the federal government.

For FY 2004, the largest portion of average public AAU institution research expenditures were federal (59%), followed by institutional (23%).

The majority of University of Missouri research expenditures in FY 2004 came from federal (44%) and institutional (43%) sources.

Overall, the University of Missouri funds a higher percentage of its research programs with institutional funds than almost all of the other public institutions.

| Institution | Federal Gov't | State & Local | Industry | Institutional* | Other | Total (\$ in thousands) |
|------------------------------|---------------|---------------|----------|----------------|-------|-------------------------|
| U. of California-Los Angeles | 60% | 3% | 4% | 18% | 16% | 772,569 |
| U. of Michigan | 68% | 2% | 4% | 20% | 6% | 769,126 |
| U. of Wisconsin-Madison | 57% | 5% | 2% | 28% | 9% | 763,875 |
| U. of Washington | 88% | 1% | 7% | 2% | 2% | 713,976 |
| U. of California-San Diego | 66% | 3% | 4% | 16% | 11% | 708,690 |
| Pennsylvania State U. | 58% | 9% | 14% | 18% | 0% | 600,139 |
| U. of California-B. | 87% | 6% | 3% | 2% | 2% | 876,875 |

