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EXECUTIVE SUMMARY

This report highlights research funding at the University of Missouri using data provided by the National Science Foundation (NSF). More specifically

ORGANIZATION

The report has been organized into the following sections:

| | |
|-----------------|--|
| Section I: | Federal Research Expenditures (Tables 1–5) |
| Section II: | Research Expenditures from Industry (Table 6) |
| Section III: | Research Expenditures by Source of Funds (Table 7) |
| Section IV: | Definitions and Technical Notes |
| Appendix A & B: | Research Expenditures and Campus Comparison Groups |

SECTION I: FEDERAL RESEARCH EXPENDITURES

The federal research expenditures reported in this section include expenditures classified as science and engineering (S&E) research and development (R&D) funds. When trend data are examined, increases or decreases in funding are noted from 1990 to 2000 and from 1995 to 2000. In addition, a definition of *federal research expenditures* is provided in Section IV: Definitions and Technical Notes.

Federal Flow-Through Expenditures

Beginning in 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 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 2000 for the University of Missouri can be partially attributed to this NSF-accepted classification method.

Please note that annual totals in research expenditures for FY1996 and FY1997 were retroactively changed in 1999. Consequently, these revised totals will not match previously published figures for these two fiscal years.

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 since 1990 and 1995.

- On average, federal research expenditures at the University of Missouri have increased 91% over the past five years and 171% over the past ten years. This compares to an increase of 28% and 81%, respectively, at the public AAU institutions.

The University of Missouri had the most significant percentage gains (91% since 1995 and 171%

**Table 1. Trends in Federal Expenditures for Science and Engineering R&D at Public AAU
Institutions 1990-2000**

(\$ in thousands)

| Institution | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | % increase since 1990 | % increase since 1995 |
|-------------|------|------|------|------|------|------|------|--------------------------|--------------------------|
| | | | | | | | | | |

If comparing data from this table with previous published tables, please notice that Texas A&M University and SUNY at Stony Brook are new members of the AAU and have been added to the table above.

Source: National Science Foundation/Division of Science Resources Statistics, Survey of Research and Development Expenditures at Colleges and Universities, FY 2000, B-33, <http://www.nsf.gov/sbe/srs/srs02402/start.htm>

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

Table 2. Market Share Gain or Loss in Federal Expenditures for Science and Engineering R&D at Public AAU Institutions, 1990 to 2000

| Institution | (\$ in thousands) | | | | | | MS +/- since 1990 | MS +/- since 1995 |
|--------------------------|-------------------|--------------|---------|--------------|---------|--------------|----------------------|----------------------|
| | 1990 | | 1995 | | 2000 | | | |
| | \$ | Market Share | \$ | Market Share | \$ | Market Share | | |
| University of Colorado | 116,394 | 3.83 | 169,666 | 3.94 | 300,394 | 5.42 | 1.59 | 1.48 |
| University of Pittsburgh | 90,700 | 2.98 | 144,487 | 3.35 | 228,155 | 4.12 | 1.13 | 0.76 |
| U of Missouri-Total | 32,219 | 1.06 | 45,600 | 1.06 | 87,237 | 1.57 | 0.51 | 0.52 |
| University of Florida | 64,614 | 2.13 | 79,361 | 1.84 | 120,374 | 2.17 | 0.05 | 0.33 |
| U MD at College Park | 66,410 | 2.19 | 94,071 | 2.18 | 136,605 | 2.46 | 0.28 | 0.28 |
| U of Washington | 203,353 | 6.69 | 291,284 | 6.76 | 389,622 | 7.03 | 0.34 | 0.27 |
| U CA Los Angeles | 164,442 | 5.41 | 201,773 | 4.68 | 274,162 | 4.95 | -0.47 | 0.27 |
| University of Kansas | 26,786 | 0.88 | 42,209 | 0.98 | 68,950 | 1.24 | 0.36 | 0.26 |
| | | | | | | | -0.36 | 0.26 |
| of Virginia | 58,801 | 1.93 | 85,244 | 1.98 | 119,243 | 2.15 | 0.22 | 0.17 |
| of Michigan | 180,456 | 5.94 | 275,956 | 6.40 | 364,033 | 6.57 | 0.63 | 0.17 |
| | 79,046 | 2.60 | 103,115 | 2.39 | 140,764 | 2.54 | -0.06 | 0.15 |
| ley | 131,717 | 4.33 | 157,826 | 3.66 | 208,338 | 3.76 | -0.58 | 0.10 |
| of Oregon | 20,151 | 0.66 | 23,789 | 0.55 | 30,793 | 0.56 | -0.11 | 0.00 |
| a Barbara | | | | | | | -0.38 | -0.11 |
| hapel Hill | 92,468 | 3.04 | 156,626 | 3.63 | 194,794 | 3.51 | 0.47 | -0.12 |
| aska at Lincoln | 22,686 | 0.75 | 36,897 | 0.86 | 37,831 | 0.68 | -0.06 | -0.17 |
| e State U NJ | 40,977 | 1.35 | 72,567 | 1.68 | 79,711 | 1.44 | 0.09 | -0.25 |
| onia State U | 136,656 | 4.50 | 187,481 | 4.35 | 226,074 | 4.08 | -0.42 | -0.27 |
| e University | 34,043 | 1.12 | 58,766 | 1.36 | 59,976 | 1.08 | -0.04 | -0.28 |
| is | 77,424 | 2.55 | 122,645 | 2.84 | 141,740 | 2.56 | 0.01 | -0.29 |
| ison | 178,862 | 5.89 | 229,381 | 5.32 | 278,629 | 5.03 | -0.86 | -0.29 |
| of Minnesota | 143,810 | 4.73 | 194,819 | 4.52 | 229,958 | 4.15 | -0.58 | -0.37 |
| e University | 78,878 | 2.60 | 122,660 | 2.85 | 132,219 | 2.39 | -0.21 | -0.46 |
| M University | 93,001 | 3.06 | 136,734 | 3.17 | 149,639 | 2.70 | -0.36 | -0.47 |
| niversity | 64,464 | 2.12 | 93,256 | 2.16 | 92,010 | 1.66 | -0.46 | -0.50 |
| of Arizona | 92,920 | 3.06 | 168,791 | 3.92 | 187,161 | 3.38 | 0.32 | -0.54 |
| Diego | 182,555 | 6.01 | 284,445 | 6.60 | 326,037 | 5.88 | -0.13 | -0.72 |
| | | 100.00 | | 100.00 | | | | |

Share (MS): An institution's federal research expenditures in a given year divided by the federal research expenditures for all AAU institutions in the same year.

If comparing data from this table with previous published tables, please note that Texas A&M University and SUNY at Stony Brook are new members of the AAU and have been added to the table above.

Table 3 ranks the public AAU institutions in terms of federal research dollars secured in 1990 and 2000.

- The University of Missouri ranked 28th among the 34 public AAU institutions in 2000. This is an improvement over its 1990 ranking (31st).

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

- In 2000 the majority of federal research funds expended by the public AAU institutions were in the life sciences (53%) followed by engineering (16%), the physical sciences (13%) and environmental sciences (8%).
- Eighteen of the thirty-four public AAU institutions in 2000 relied on one disciplinary area to provide the majority of their federal research expenditures. In every one of these cases the discipline area was life sciences.
- Where Columbia and Kansas City secured 70% and 79% of their federal expenditures from life sciences, respectively, Rolla garnered 73% of its federal funds in engineering. St Louis received federal funds in more evenly dispersed percentages with 26% being in the physical sciences, 42% of its federal funding in life sciences, 15% in psychology and 14% in the social sciences.

| Institution | Engi- neering | Physical | Environ- mental | Math & computer | Life sciences | Psy- chology | Social sciences | Other sciences | Total |
|--------------------|--------------------------|-----------------|----------------------------|--------------------------------|--------------------------|-------------------------|----------------------------|---------------------------|--------------|
|--------------------|--------------------------|-----------------|----------------------------|--------------------------------|--------------------------|-------------------------|----------------------------|---------------------------|--------------|

(in thousands)

Table 5 displays each public AAU institution's market share within the eight discipline areas. The University of Missouri's federal research expenditures from the four campuses are pooled.

- The discipline areas where the University of Missouri secured the most significant market share were in psychology (2.9%) and social sciences (2.6%)
- Market share leaders in each discipline area were: Pennsylvania State University in engineering (11.2%), the University of Colorado in the physical sciences (9.3%), the University of California, San Diego in environmental sciences (17.6%), and the University of Illinois in math and computer science (16.5%). In addition, other leaders by discipline area included the University of Washington in life sciences (9.1%), University Wisconsin-Madison in psychology (13.9%), and the University of Michigan in the social sciences (19.8%).

| Institution | Engi- neering | Physical | Environ- mental | Math & computer | Life sciences | Psy- chology | Social sciences | Other sciences | Total |
|--------------------------|--------------------------|-----------------|----------------------------|--------------------------------|--------------------------|-------------------------|----------------------------|---------------------------|-------------------|
| | | | | | | | | | (\$ in thousands) |
| U of Washington | 2.8 | 2.9 | 14.1 | 3.1 | 9.1 | 6.9 | 0.6 | 0.0 | 389,622 |
| University of Michigan | 9.8 | 2.7 | 1.3 | 2.3 | 6.8 | 3.4 | 19.8 | 0.0 | 364,033 |
| U CA San Diego | 2.8 | 3.7 | 17.6 | 15.3 | 5.3 | 3.4 | 2.0 | 0.1 | 326,037 |
| University of Colorado | 2.6 | 9.3 | 13.6 | 2.8 | 4.6 | 5.0 | 2.5 | 8.4 | 300,394 |
| U WI-Madison | 4.7 | 4.6 | 4.3 | 3.0 | 5.0 | 13.9 | 6.5 | 0.0 | 278,629 |
| U CA Los Angeles | 3.4 | 4.2 | 2.1 | 3.3 | 6.4 | 5.1 | 1.3 | 0.1 | 274,162 |
| University of Minnesota | 2.8 | 2.7 | 1.4 | 3.6 | 5.6 | 4.1 | 1.3 | 0.0 | 229,958 |
| University of Pittsburgh | 0.7 | 1.5 | 0.1 | 1.0 | 6.7 | 3.0 | 2.2 | 7.9 | 228,155 |
| Pennsylvania State U | 11.2 | 3.9 | 2.6 | 2.6 | 2.3 | 4.8 | 2.4 | 15.4 | 226,074 |
| U CA Berkeley | 6.4 | 7.8 | 0.9 | 2.2 | 2.6 | 3.5 | 2.6 | 8.0 | 208,338 |
| U of NC Chapel Hill | 0.0 | 2.0 | 1.5 | 2.4 | 5.1 | 2.7 | 6.8 | 0.0 | 194,794 |
| U of IL Urbana-Champaign | 6.5 | 4.9 | 2.5 | 16.5 | 1.3 | 4.3 | 1.8 | 17.8 | 193,490 |
| University of Arizona | 3.3 | 7.2 | 1.5 | 2.2 | 3.1 | 0.0 | 2.8 | 0.0 | 187,161 |

SECTION II: RESEARCH EXPENDITURES FROM INDUSTRY

Table 6 shows the growth in industry-sponsored research expenditures for the public AAU institutions from 1990 to 2000 and the gain or loss from 1995 to 2000. The institutions are arranged in descending order based on gain or loss since 1995. Please note that a definition of *industry-sponsored research expenditures* is provided in Section III: Definitions and Technical Notes.

- Ohio State University, University of Florida, and University of California, San Diego show the largest gains in industry-sponsored research expenditures among the public AAU institutions.

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| Institution | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | \$ Gain/Loss since 1995 |
|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------------------------------|
|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------------------------------|

SECTION III: RESEARCH EXPENDITURES BY SOURCE OF FUNDS

Universities have sources other than federal agencies for funding research operations for their institution. 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: Sources of Research Expenditures***

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.

- The University of Colorado and tUniversityT0.0003.tions arevn de. 10.8gttsburgh,.00cei.0005 Tw -13.1803 -1.153

| | | | | | | |
|---------------------------|-----|-----|-----|-----|-----|-----------|
| University of Colorado | 85% | 1% | 3% | 8% | 4% | 353,528 |
| University of Pittsburgh | 83% | 1% | 5% | 10% | 1% | 275,314 |
| University of Virginia | 75% | 4% | 11% | 10% | 0% | 159,279 |
| U of Washington | 75% | 2% | 11% | 12% | 0% | 522,265 |
| U CA Santa Barbara | 72% | 2% | 5% | 17% | 5% | 112,722 |
| University of Oregon | 72% | 1% | 1% | 7% | 20% | 43,002 |
| University of Michigan | 71% | 1% | 7% | 21% | | 512,641 |
| U TX at Austin | 69% | 7% | 9% | 15% | | 260,713 |
| U of Iowa | 64% | 3% | 8% | 25% | | 219,156 |
| U CA San Diego | 63% | 5% | 7% | 17% | 9% | 518,559 |
| U CA Los Angeles | 62% | 4% | 8% | 27% | | 443,909 |
| SUNY at Buffalo | 61% | 4% | 4% | 31% | | 157,194 |
| U CA Irvine | 59% | 4% | 12% | 18% | 7% | 149,869 |
| SUNY at Stony Brook | 57% | 3% | 4% | 29% | 7% | 168,522 |
| U MD at College Park | 57% | 20% | 0% | 22% | | 240,454 |
| University of Arizona | 57% | 3% | 7% | 34% | | 330,834 |
| U WI-Madison | 56% | 8% | 3% | 32% | | 496,077 |
| Pennsylvania State U | 54% | 4% | 15% | 27% | 0% | 421,367 |
| U of Illinois Urbana-Cham | 54% | 13% | 4% | 29% | 1% | 361,118 |
| Indiana University | 50% | 1% | 3% | 43% | 3% | 215,009 |
| University of Kansas | 50% | 4% | 11% | 34% | 1% | 138,544 |
| U CA Berkeley | 44% | 14% | 6% | 35% | 2% | 477,503 |
| Michigan State University | 42% | 18% | 5% | 30% | 5% | 232,363 |
| U of Missouri Columbia | 41% | 11% | 3% | 40% | 6% | 158,861 |
| U CA Davis | 40% | 9% | 5% | 41% | 5% | 350,862 |
| Ohio State University | 40% | 19% | 17% | 24% | | 330,855 |
| University of Florida | 39% | 22% | 11% | 27% | 0% | 304,912 |
| Purdue University | 39% | 13% | 13% | 35% | | 234,312 |
| Texas A&M University | 38% | 28% | 8% | 26% | | 389,345 |
| Rutgers the State U NJ | 38% | 12% | 4% | 41% | 4% | 209,881 |
| Iowa State University | 31% | 25% | 8% | 24% | 13% | 196,641 |
| U of Nebraska at Lincoln | 29% | 4% | 5% | 62% | | 128,901 |
| University of Minnesota | 13% | 3% | 2% | 4% | 78% | 1,717,184 |
| U of NC Chapel Hill | 13% | 1% | 0% | 3% | 82% | 1,500,168 |
| Public AAU Average | 53% | 8% | 7% | 25% | 12% | |
| Columbia | 41% | 11% | 3% | 40% | 6% | 158,861 |
| Kansas City | 38% | 0% | 3% | 53% | 5% | 19,647 |
| Rolla | 38% | 1% | 10% | 42% | 9% | 25,968 |
| St Louis | 49% | 2% | 4% | 46% | 3% | 9,898 |

SECTION IV: DEFINITIONS AND TECHNICAL NOTES

The following definitions, provided by the National Science Foundation (NSF), are most relevant to the tables in this report:

Federal research expenditures: when funds for research from the federal government are actually spent they are then considered “expenditures”. For example, if the University received a two-year, two million dollar grant from NASA in FY1993 and spent \$1.5 million the first year and \$0.5 million in the second year, the federal expenditures would

**APPENDIX A AND B:
RESEARCH EXPENDITURES AND CAMPUS COMPARATOR GROUPS**

In response to the University-wide Strategic Planning initiative, the following tables were added to the Research Funding Report. Appendix A examines federal research expenditures for science and engineering relative to a different group of comparator institutions for each of the University

Appendix A

| UM-Columbia Comparison Group | 1997 | 1998 | 1999 | 2000 | 3 Year % +/- |
|-------------------------------------|-------------|-------------|-------------|-------------|---------------------|
| U of Missouri Columbia | 43,335 | 45,448 | 53,875 | 65,420 | 51.0% |
| Louisiana St U, All Camp | 65,257 | 67,090 | 75,831 | 89,007 | 36.4% |
| Colorado State University | 79,393 | 80,451 | 91,943 | 101,429 | 27.8% |
| University of Kentucky | 62,128 | 60,760 | 66,184 | 73,858 | 18.9% |

Appendix A continued

| UM-Rolla Comparison Group* | 1997 | 1998 | 1999 | 2000 | 3 Year % +/- |
|-----------------------------------|--------------|--------------|--------------|--------------|---------------------|
| Michigan Tech University | 12,941 | 13,938 | 16,107 | 16,650 | 28.7% |
| Colorado School of Mines | 9,330 | 8,694 | 10,704 | 11,995 | 28.6% |
| SD Sch of Mines & Tech | 2,990 | 3,221 | 3,300 | 4,127 | 38.0% |
| Clarkson University | 3,368 | 3,010 | 3,694 | 3,837 | 13.9% |
| U of Missouri Rolla | 8,080 | 7,934 | 8,731 | 9,804 | 21.3% |
| Rensselaer Polytech Inst | 22,785 | 21,774 | 22,803 | 25,555 | 12.2% |
| Worcester Polytech Inst | 7,315 | 5,230 | 4,292 | 4,219 | -42.3% |
| Kettering University | 176 | 192 | 89 | 270 | 53.4% |
| Total | 66,985 | 63,993 | 69,720 | 76,457 | |
| Market Share for UM-Rolla | 12.1% | 12.4% | 12.5% | 12.8% | |

| UM-St Louis Comparison Group | 1997 | 1998 | 1999 | 2000 | 3 Year % +/- |
|-------------------------------------|-------------|----------------|-------------|-------------|---------------------|
| University of Toledo | 2,937 | 5,366 | 5,682 | 6,312 | 114.9% |
| The University of Memphis | 5,413 | 5,849 | 6,364 | 11,177 | 106.5% |
| Wichita State U | 2,602 | 2,646 | 3,260 | 5,228 | 100.9% |
| Florida International U | 5,228 | 11,235 | 20,230 | 20,230 | |
| 10160 | -4042 | 70164 | 8,081 | | |
| U nsselaer PolSf TDiego | 0.62,602 | 7157.7420,2350 | 76,410 | 25,52 | |
| 03, J) Share for UM-Roll | | | | | |

Appendix B

Industry-Sponsored Research Expenditures for Science and Engineering R&D at the University of Missouri Campuses and Respective Comparison Groups FY1997 to FY2000

| UM-Columbia Comparison Group | (\$ in thousands) | | | | 3 Year '%+/- | Rank by 2000 \$ |
|----------------------------------|-------------------|-------|-------|-------|--------------|-----------------|
| | 1997 | 1998 | 1999 | 2000 | | |
| U of Missouri Columbia | 3,777 | 4,348 | 3,832 | 4,007 | 6.1% | 12 |
| <hr/> | | | | | | |
| UM-Kansas City Comparison Group* | 1997 | 1998 | 1999 | 2000 | 3 Year '%+/- | Rank by 2000 \$ |
| U of Missouri Kansas City | 348 | 505 | 427 | 660 | 89.7% | 7 |

*Data were not available

Continued on next page

Appendix B continued

| UM-Rolla Comparison Group* | (\$ in thousands) | | | | 3 Year '%+/- | Rank by 2000 \$ |
|-----------------------------------|-------------------|-------------|-------------|-------------|---------------------|------------------------|
| | 1997 | 1998 | 1999 | 2000 | | |
| U of Missouri Rolla | 1,575 | 1,361 | 2,079 | 2,543 | 61.5% | 4 |

* Data were not available

**No data were not available for Kettering University, SD Sch of Mines and Tech, and Rose-Hulman Institute.

| UM-St Louis Comparison Group* | 1997 | 1998 | 1999 | 2000 | 3 Year '%+/- | Rank by 2000 \$ |
|--------------------------------------|-------------|-------------|-------------|-------------|---------------------|------------------------|
| U of Missouri St Louis | 274 | 273 | 386 | 461 | 68.2% | 3 |

*Data not available

*Data were not available for the Florida International U, San Diego State U, U of Toledo and Wichita State University.

Source: National Science Foundation/Division of Science Resources Statistics, Survey of Research and Development Expenditures at Colleges and University, FY 2000, B-38, <http://www.nsf.gov/sbe/srs/srs02402/start.htm>

P&B, January 2002