

**Status on Research Funding  
At the University of Missouri  
2000**

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University of Missouri System

## **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

## **ORGANIZATION**

The report has been organized into the following sections:

Section I: Federal Research Expenditures (Tables 1–5)

## **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 1998 and from 1995 to 1998. 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, 1997 and 1998 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:***

#### ***Public AAU Institutions: Trends in Federal Research Expenditures***

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 39% over the past three years and 97% over the past eight years. This compares to an increase of 9% and 54%, respectively, at the public AAU institutions.
- Since 1995, the University of Maryland, the University of Colorado, and the University of Florida, in that order, have made the most significant percentage gains among the public AAU institutions. There were nine public AAU institutions that did not show increases in federal research funding from 1995 to 1998.

<b>Institution</b>	<b>1990</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>% increase since 1990</b>	<b>% increase since 1995</b>
U of Maryland-College Park							

***Table 2:***  
***Public AAU Institutions: Market Share Increases and Decreases in Federal Research Expenditures***

An alternative approach to

(\$ in thousands)

Institution	\$	Market Share	\$	Market Share	\$	Market Share	MS +/- since 1990	MS +/- since 1995
U of Colorado	116,394	4.03	169,666	4.14	228,342	5.10	1.07	0.96
U of Maryland-College Park	66,410	2.30	94,071	2.30	129,198	2.88	0.59	0.59

***Table 3:***

***Public AAU Institutions: The University of Missouri's Rank in Federal Research Expenditures***

Table 3 ranks the public AAU institutions in terms of federal research dollars secured in 1990 and 1998.

- The University of Missouri ranked 28<sup>th</sup> among the 32 public AAU institutions in 1998. This is one position better than its 1990 ranking (29<sup>th</sup>).



**(\$ in thousands)**

<b>Rank</b>	<b>1990 Institution</b>	<b>\$</b>	<b>Rank</b>	<b>1998 Institution</b>	<b>\$</b>
1	U of Washington	203,353	1	U of Washington	336,748
2	U of California-San Diego	182,555	2	U of Michigan	311,450
3	U of Michigan				

**Table 4:**  
***Distribution of Federal Research Expenditures by Field***

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

- In 1998 the majority of federal research funds expended by the public AAU institutions were in the life sciences (52%) followed by engineering (16%), the physical sciences (13%) and environmental sciences (7%). The remaining disciplines accounted for 12% of the expenditures.
- Eighteen of the thirty-one public AAU institutions in 1998 (not including the University of Missouri) 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 80% of their federal expenditures from life sciences, respectively, Rolla garnered 69% of its federal funds in engineering and St Louis received 32% of its federal funds in physical sciences and 32% of its federal funding in life sciences.

Institution	Engineering	Physical	Environmental	Math &	Life	Psy-	Social	Other
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***Table 5:  
Market Share of Federal Research Expenditures within Each Discipline Area among the Public AAU  
Institutions***

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 has been pooled.

- The discipline areas where the University of Missouri had secured the most significant market share were in psychology (3.0%), social sciences (2.4%), life sciences (1.6%), and engineering (1.3%).
- Market share leaders in each discipline area were: Pennsylvania State in engineering (11.7%), the University of Texas in the physical sciences (12.9%), the University of Colorado in environmental sciences (19.1%), and the University of Illinois in math and computer science (20.6%). In addition, the leaders by discipline area included the University of Washington in life sciences (9.5%), UW Madison in psychology (13.1%), and the University of Maryland in the social sciences (15.0%).

Institution	Engi- neering	Physical	Environ- mental	Math & computer	Life sciences	Psy- chology	Social sciences	Other sciences	Total
									(in thousands)
U of Washington	3.0	2.9	17.8	3.9	9.5	8.3	0.4	0.0	336,748
University of Michigan	9.4	3.0	5.7	1.8	7.3	5.0	14.7	1.7	311,450
U CA San Diego	3.7	4.9	18.4	6.0	5.4	2.3	2.6	0.2	262,303
U WI Madison	4.7	4.9	5.3	3.8	5.4	13.1	6.9	0.1	240,513
U CA Los Angeles	3.8	4.2	1.7	4.3	6.8	4.8	1.6	0.0	233,702
University of Colorado	2.3	5.4	19.1	3.1	4.5	3.8	1.3	4.7	228,342
University of Minnesota	3.3	2.6	1.4	4.3	6.2				

## **SECTION II: RESEARCH EXPENDITURES FROM INDUSTRY**

***Table 6:  
Industry-Sponsored Research Expenditures***

Table 6 shows the growth in industry-sponsored research expenditures for the public AAU institutions from 1990 to 1998 and from 1995 to 1998. The institutions are arranged in descending order based on their level of growth in dollars since 1995. Please note that a definition of *industry-sponsored research expenditures* is provided in Section III: Definitions and Technical Notes.

- Over the past three years, the University of Texas, Ohio State University, and UC San Diego have shown the largest gains in industry-sponsored research expenditures among the public AAU institutions.
- The institutions that lead the public AAU group in terms of industry-sponsored research are Pennsylvania State University (\$63.3 million), Ohio State University (\$40.4 million), and the University of Washington (\$38.4 million).
- The University of Missouri secured \$6.5 million in industry-sponsored research expenditures in 1998.

Institution	(\$ in thousands)					\$ Gain/Loss since 1995
	1990	1995	1996	1997	1998	
U TX Austin	3,507	3,257	15,029	29,887	31,326	28,069
Ohio State University	14,744	21,827	30,870	36,685	40,401	18,574
U CA San Diego	9,135	11,363	15,130	19,266	26,814	15,451
Pennsylvania State U	34,806	50,225	52,771	56,666	63,319	13,094
U CA Los Angeles	8,310	14,892	15,788	19,586	27,817	12,925
University of Florida	12,237	10,611	23,532	25,217	21,393	10,782
U CA Berkeley	10,892	13,842	15,128	17,125	20,483	6,641
U CA Irvine	3,115	9,139	10,391	10,445	15,712	6,573
U CA Davis	7,461	8,053	9,387	9,362	14,077	6,024
U of Iowa	6,827	11,359	14,862	15,712	17,262	5,903
Iowa State University	5,525	8,017	7,407	8,499	13,717	5,700
University of Michigan	27,128	28,987	34,975	31,411	33,029	4,042
U of NC Chapel Hill	2,179	2,403	2,592	3,311	4,860	2,457
University of Colorado	7,426	7,607	8,902	9,403	9,963	2,356
University of Pittsburgh	6,481	8,208	7,880	9,753	10,436	2,228
U of Illinois Urbana	20,762	11,832	12,365	11,761	13,917	2,085
Purdue University	11,632	25,147	25,720	26,090	26,988	1,841

**SECTION III:**  
**RESTRICTED AND UNRESTRICTED RESEARCH EXPENDITURES**

Universities hav



***Table 7:  
Restricted and Unrestricted Research Expenditures***

Table 7 shows the restricted and unrestricted research expenditures for the public AAU institutions. These data originate from the IPEDS-F (Finance) annual survey and not from the NSF survey.

- The University of Washington (95%), UC San Diego (91%), and the University of Colorado (91%) received the highest percentage of restricted research funds among the public AAU institutions. The public AAU institutions average 80% in restricted research expenditures.
- Fifty-five percent of the total research expenditures at the University of Missouri were restricted in 1998. This would rank the University 30<sup>th</sup> among the public AAU institutions in terms of the percentage of restricted research expenditures.

**(\$ in thousands)**

<b>Institutions</b>	<b>Unrestricted</b>	<b>Restricted</b>	<b>Total</b>	<b>Percentage Restricted</b>
U of Washington	16,766	341,002	357,768	95%
University of Colorado	12,903	138,603	151,506	91%
U CA San Diego	27,359	284,522	311,881	91%
U of Iowa	15,911	121,984	137,895	88%
U CA Los Angeles	37,386	282,659	320,045	88%
U CA Santa Barbara	9,829	67,120	76,949	87%
Iowa State University	17,411	109,118	126,529	86%
Ohio State University	27,329	171,075	198,404	86%
University of Michigan	55,014	330,336	385,350	86%
U CA Irvine	14,131	82,663	96,794	85%
Purdue University	16,754	96,351	113,105	85%
University of Virginia	19,187	110,162	129,349	85%
U of NC Chapel Hill	25,411	135,717		

***Table 8:***  
***Sources of Research Expenditures***

Table 8 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 Oregon, University of Pittsburgh, and University of Washington received over 75% of their research expenditures from the federal government, ranking them at the top among the public AAU institutions.
- Among the thirty-two public AAU institutions, the University of Missouri would rank near the bottom in terms of the percentage of research funds it receives from the federal government.
- The University of Missouri funds a higher percentage of its research program (42% to 50%,

<b>Institution</b>	<b>Federal Gov't</b>	<b>State &amp; Local</b>	<b>Industry</b>	<b>Institutional*</b>	<b>Other</b>	<b>Total (in thousands)</b>
University of Oregon	81%	1%	0%	11%	7%	33,315
University of Pittsburgh	79%	0%	5%	9%	7%	213,842
U of Washington	78%	2%	9%	9%	2%	432,383
University of Colorado	73%	2%	3%	11%	11%	311,203
U of NC Chapel Hill	73%	13%	2%	12%	0%	235,296
U CA Santa Barbara	71%	2%	4%	16%	7%	96,034
University of Virginia	70%	3%	9%	9%	9%	133,049
U TX Austin	67%	6%	13%	12%	2%	244,843
University of Michigan	63%	1%	7%	22%	8%	496,761
U CA San Diego	63%	5%	6%	17%	9%	418,790
U of Iowa	58%	3%	9%	23%	7%	199,063
U MD College Park	58%	17%	1%	22%	3%	223,190
University of Minnesota	57%	13%	7%	15%	8%	360,323
Indiana University	56%	1%	4%	28%	11%	171,754
U WI Madison	54%	9%	3%	22%	12%	443,695
University of Arizona	54%	3%	5%	34%	4%	302,328
U CA Los Angeles	52%	2%	6%	26%	14%	447,367
Pennsylvania State U	51%	4%	17%	28%	0%	362,643
U CA Irvine	51%	4%	12%	21%	12%	130,415
SUNY Buffalo	50%	3%	2%	26%	19%	151,650
U of Illinois Urbana	50%	10%	4%	32%	4%	338,841
University of Kansas	43%	8%	7%	30%	11%	117,115
Purdue University	43%	11%	12%	34%	0%	216,479
Michigan State University	42%	18%	4%	32%	4%	193,611
Ohio State University	41%	18%	13%	20%	8%	301,518
U CA Berkeley	41%	11%	5%	34%	9%	420,435
U CA Davis	40%	7%	5%	41%	8%	288,796
University of Florida	39%	21%	8%	29%	4%	274,862
Rutgers the State U NJ	35%	12%	5%	40%	8%	197,053
U of Nebraska Lincoln	35%	33%	4%	26%	2%	118,857
Iowa State University	33%	30%	9%	27%	2%	156,766
Public AAU Average	55%	9%	6%	23%	7%	
University of Missouri:						
Columbia	33%	12%	3%	46%	4%	136,061
Kansas City	48%	1%	4%	42%	5%	12,875
Rolla	36%	1%	6%	50%	7%	21,740
St Louis	42%	3%	3%	49%	3%	9,462

\* Institutional funds include: 1)

P&B, 1/2000

## **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 "expen

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

In response to the University-wide Strategic Planning initiative, the following tables were added

Note: Revisions to Appendix A were made on February 2, 2000.

## Appendix A

<b>UM-Columbia Comparison Group</b>	<b>1997</b>	<b>1998</b>	<b>% +/-</b>
NC State University	69,473	79,533	14.5%
<b>U of Missouri Columbia</b>	<b>43,335</b>	<b>45,448</b>	<b>4.9%</b>
Louisiana St U, All Camp	65,257	67,090	2.8%
U of Nebraska Lincoln	41,269	41,888	1.5%
Colorado State University	79,393	80,451	1.3%
University of Georgia	54,364	54,712	0.6%
University of Kentucky	62,128	60,760	

Note: Revisions to Appendix A were made on February 2, 2000.

**Appendix A continued**

	(\$ in thousands)		
<b>UM-Rolla Comparison Group**</b>	<b>1997</b>	<b>1998</b>	<b>% +/-</b>
Kettering University	176	192	9.1%
SD Sch of Mines & Tech	2,990	3,221	7.7%
Michigan Tech University	12,941	13,938	7.7%
<b>U of Missouri Rolla</b>	<b>8,080</b>	<b>7,934</b>	<b>-1.8%</b>
Rensselaer Polytech Inst	22,785	21,774	-4.4%
Colorado School of Mines	9,330	8,694	-6.8%
Clarkson University	3,368	3,010	-10.6%
Worcester Polytech Inst	7,315	5,230	-28.5%
Total	66,985	63,993	-4.5%
Market Share for UM-Rolla	12.1%	12.4%	

\*\* Data were unavailable for Rose-Hulman Institution of Technology.

<b>UM-St Louis Comparison Group</b>	<b>1997</b>	<b>1998</b>	<b>% +/-</b>
University of Toledo	2,937	5,366	82.7%
U WI Milwaukee	8,156	8,936	9.6%
<b>U of Missouri St Louis</b>	<b>3,650</b>	<b>3,975</b>	<b>8.9%</b>
Wright State University	10,001	10,832	8.3%
The University of Memphis	5,413	5,849	8.1%
Florida International U	13,828	14,243	3.0%
Wichita State U	2,602	2,646	1.7%
San Diego State U	20,237	19,721	-2.5%
U of Akron	5,146	4,042	-21.5%
UT-Arlington	26,829	11,294	-57.9%
Total	98,799	86,904	-12.0%
Market Share for UM-St Louis	3.7%	4.6%	

Source: NSF Survey of R&D Expenditures at Colleges and Universities, FY1998.  
P&B, 1/2000



Note: Revisions to Appendix B were made on February 2, 2000.

## Appendix B

<b>UM-Columbia Comparison Group</b>	<b>1997</b>	<b>1998</b>	<b>%+/-</b>	<b>Rank by \$</b>
Iowa State University	8,499	13,717	61.4%	3
U CA Davis	9,362	14,077	50.4%	2
West Virginia University	3,719	4,547	22.3%	11
University of Kentucky	11,259	13,668	21.4%	4
NC State University	26,834	31,429	17.1%	1
<b>U of Missouri Columbia</b>	<b>3,777</b>	<b>4,348</b>	<b>15.1%</b>	<b>12</b>
Colorado State U	5,712	6,155	7.8%	9
VA Polytech Inst & St U	11,385	12,132	6.6%	7
University of Georgia	10,283	10,534	2.4%	8
U of Nebraska Lincoln	4,651	4,721	1.5%	10
U of Tennessee System	12,675	12,551	-1.0%	5
Louisiana St U, All Campus	13,331	12,157	-8.8%	6
Total				

Note: Revisions to Appendix B were made on February 2, 2000.

### Appendix B continued

<b>UM-Rolla Comparison Group**</b>	<b>1997</b>	<b>1998</b>	<b>%+/-</b>	<b>Rank by \$</b>
Worcester Polytech Inst	1,185	1,485	25.3%	5
Colorado School of Mines	8,038	9,877	22.9%	2
Rensselaer Polytech Inst	9,340	10,974	17.5%	1
Clarkson University	1,512	1,500	-0.8%	4
Michigan Tech University	3,819	3,747	-1.9%	3
<b>U of Missouri Rolla</b>	<b>1,575</b>	<b>1,361</b>	<b>-13.6%</b>	<b>6</b>
Total	25,469			