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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 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		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.

National Science Foundation Division of Science Resources Statistics, Survey of Research and Development Expenditures by Colleges and Universities, FY 2000, B-33, <http://www.nsf.gov/sbr/srs/sr02402/start.htm>

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

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





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.

<b>Institution</b>	<b>Engi- neering</b>	<b>Physical</b>	<b>Environ- mental</b>	<b>Math &amp; computer</b>	<b>Life sciences</b>	<b>Psy- chology</b>	<b>Social sciences</b>	<b>Other sciences</b>	<b>Total</b>
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(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%).

<b>Institution</b>	<b>Engi- neering</b>	<b>Physical</b>	<b>Environ- mental</b>	<b>Math &amp; computer</b>	<b>Life sciences</b>	<b>Psy- chology</b>	<b>Social sciences</b>	<b>Other sciences</b>	<b>Total</b>
									(\$ 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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<b>Institution</b>	<b>1990</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>\$ Gain/Loss since 1995</b>
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### **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

<b>UM-Columbia Comparison Group</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>3 Year % +/-</b>
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

<b>UM-Rolla Comparison Group*</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>3 Year % +/-</b>
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%
<b>U of Missouri Rolla</b>	<b>8,080</b>	<b>7,934</b>	<b>8,731</b>	<b>9,804</b>	<b>21.3%</b>
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%	

<b>UM-St Louis Comparison Group</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>3 Year % +/-</b>
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

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

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\* Data were not available

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

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

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\*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>

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