

**Status on FY2002 Research Funding  
at the University of Missouri**

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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, 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 2002. 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. Trends in research funding have been examined from 1990-2002.

The key findings include:

### *Federal Research Expenditures*

On average, federal research expenditures at the University of Missouri have increased 72% since 1998 and 238% since 1990. This compares to an increase of 44% and 122%, respectively, at the public AAU institutions (Table 1).

From 1995 to 2001, the University’s market share in federal research expenditures among the public AAU institutions increased from 1.06% to 1.55%. From 2001 to 2002, the University’s market share increased from 1.55 to 1.60. (Table 2).

In terms of federal research expenditures, the University of Missouri ranked 26<sup>th</sup> among the 34 public AAU institutions in 2002. The University held the rank of 31<sup>st</sup> in 1990 (Table 3).

## **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:**

**FF**

Table 1. Trends in Federal Expenditures for Science and Engineering R&D at Public AAU Institutions,  
1990, 1998-2002

Institution	(\$ in thousands)						% increase since 1990	% increase since 1998
	1990	1998	1999	2000	2001	2002		
University of Pittsburgh	90,700	168,511	194,618	228,155	268,571	306,913	238%	82%
U CA Irvine	52,492	65,902	75,505	88,274	101,735	115,548	120%	75%
SUNY at Buffalo	66,876	76,037	85,490	96,410	96,595	128,842	93%	69%
University of Kansas	26,786	50,567	57,272	68,950	74,494	82,663	209%	63%
University of Virginia	58,801	93,328	108,495	119,243	122,868	152,358	159%	63%
U CA Los Angeles	164,442	233,702	251,999	274,162	312,858	366,762	123%	57%
University of Florida	64,614	106,510	122,296	120,374	139,744	167,108	159%	57%
U of Iowa	79,046	115,312	122,638	140,764	155,249	180,743	129%	57%
U CA Davis	77,424	114,912	124,463	141,740	154,937	176,644	128%	54%
Pennsylvania State U	136,656	186,274	199,105	226,074	245,951	284,706	108%	53%
Michigan State University	58,221	81,146	89,835	97,112	112,359	122,595	111%	51%
U MD at College Park	66,410	129,198	145,081	136,605	145,515	194,095	192%	50%
University of Colorado	116,394	228,342	244,686	300,394	308,643	340,466	193%	49%
U of NC Chapel Hill	92,468	171,505	182,935	194,794	221,615	254,571	175%	48%
U of Washington	203,353	336,748	368,112	389,622	435,103	487,059	140%	45%
University of Minnesota	143,810	204,741	207,761	229,958	264,289	295,301	105%	44%
U WI-Madison	178,862	240,513	249,961	278,629	304,009	345,003	93%	43%
Ohio State University	78,878	124,177	135,216	132,219	161,092	177,883	126%	43%
University of Michigan	180,456	311,450	334,226	364,033	396,117	444,255	146%	43%
Iowa State University	34,043	51,196	54,179	59,976	62,024	71,419	110%	40%
Indiana University	57,155	95,840	102,262	107,577	116,781	132,759	132%	39%
University of Oregon	20,151	27,041	27,336	30,793	32,232	37,177	84%	37%
U CA San Diego	182,555							
U TX at Austin	109,593	165,082	164,913	178,889	195,184	219,158	100%	33%
University of Arizona	92,920	161,999	178,126	187,161	199,484	214,844	100%	33%



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

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 1995, 2000, 2001, and 2002.

Among the public AAU institutions, the market share for the University of Missouri increased from 1.06 in 1995 to 1.57 in 2000. However from 2000 to 2001, the University's market share decreased from 1.57 to 1.55. Then, in 2002, the University market share increased from 1.55 to 1.60.

Table 2. Market Share Gain or Loss in Federal Expenditures for Science and Engineering R&D at Public AAU Institutions, 1995, 2000-2002

Institution	(\$ in thousands)				Market Share +/- since 1995
	1995	2000	2001	2002	
	\$ Market Share	\$ Market Share	\$ Market Share	\$ Market Share	



***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 2002.

The University of Missouri ranked 26<sup>th</sup> among the 34 public AAU institutions in 2002. This is an improvement over its 1990 ranking (31<sup>st</sup>).

Table 3. Federal Expenditures for Science and Engineering R&D: Changes in Rank Among the Public AAU Institutions between 1990 and 2002

(\$ in thousands)

1990			2002		
Rank	Institution	\$	Rank	Institution	\$
1	U of Washington	203,353	1	U of Washington	487,059
2	U of California-San Diego	182,555	2	University of Michigan	444,255
3	U of Michigan	180,456	3	U CA Los Angeles	366,762
4	U of Wisconsin-Madison	178,862	4	U CA San Diego	359,383
5	U of California-Los Angeles	164,442	5	U WI-Madison	345,003
6	U of Minnesota	143,810	6	University of Colorado	340,466
7	Pennsylvania State U	136,656	7	University of Pittsburgh	306,913
8	U of California-Berkeley	131,717	8	University of Minnesota	295,301
9	U of Illinois-Urbana	117,168	9	Pennsylvania State U	284,706
10	U of Colorado	116,394	10	U of NC Chapel Hill	254,571
11	U of Texas-Austin	109,593	11	U TX at Austin	219,158
12	Texas A&M University	93,001	12	U CA Berkeley	217,297
13	U of Arizona	92,920	13	U of IL Urbana-Champaign	214,323
14	U of N Carolina-Chapel Hill	92,468	14	University of Arizona	211,772
15	U of Pittsburgh	90,700	15	U MD at College Park	194,095
16	U of Iowa	79,046	16	U of Iowa	180,743
17	Ohio State U	78,878	17	Ohio State University	177,883
18	U of California-Davis	77,424	18	U CA Davis	176,644
19	SUNY-Buffalo	66,876	19	University of Florida	167,108
20	U of Maryland-College Park	66,410	20	Texas A&M University	163,488
21	U of Florida	64,614	21	University of Virginia	152,358



Table 4. Federal R&D Expenditures at the Public AAU Institutions by Science and Engineering Field, FY2002

Institution	Engi- neering	Physical	Environ- mental	Math & computer	Life sciences	Psy- chology	Social sciences	Other sciences	Total
	Row Percentages								(in thousands)
Indiana University	0	13	13	3	1	5	3	0	132,759
Iowa State University	27	8	3	7	45	0	10	1	71,419
Michigan State University									122,595
Ohio State University	15	9	3	2	61	3	6	0	177,883
Pennsylvania State U	43	14	5	3	29	3	3	0	284,706
Purdue University	28	13	2	6	45	2	3	0	107,477
Rutgers the State U NJ	15	18	13	6	41	4	3	0	91,205
SUNY at Buffalo	19	6	0	3	69	2	1	0	128,842
SUNY at Stony Brook	8	16	12	6	53	3	1	0	108,122
Texas A&M University	22	9	34	6	26	1	1	0	163,488
U CA Berkeley	25	25	2	3	39	3	2	1	217,297
U CA Davis	10	8	8	2	70	0	2	1	176,644
U CA Irvine	7	12	3	4	68	3	3	0	115,548
U CA Los Angeles	9	9	2	3	73	2	2	0	366,762
U CA San Diego	8	8	20	11	50	1	1	0	359,383
U CA Santa Barbara									78,370
U of IL Urbana-Champaign	29	14	5	25	21	3	2	1	214,323
U of Iowa	6	8	1	1	82	2	1	0	180,743
U MD at College Park	23	30	4	11	14	2	17	0	194,095
U of NC Chapel Hill	0	5	3	3	75	2	12	0	254,571
U of Nebraska at Lincoln	12	14	5	6	47	7	5	3	51,405
U of Washington	9	4	13	2	70	2	1	0	487,059
U WI-Madison	17	10	7	3	53	5	5	0	345,003
U TX at Austin	36	24	5	17	13	2	3	0	219,158
University of Arizona									211,772
University of Colorado	8	16	16	2	53	2	3	0	340,466
University of Florida	19	11	2	4	61	3	2	0	167,108
University of Kansas	10	6	3	1	73	2	4	2	82,663
University of Michigan	23	5	1	1	54	2	14	0	444,255
University of Minnesota									295,301
University of Oregon	0	19	4	7	42	23	5	0	37,177
University of Pittsburgh	3	4	0	1	88	2	2	0	306,913
University of Virginia	15	8	3	3	68	3	1	0	152,358
Public AAU Distribution	15	11	6	5	55	2	4	0	6,686,870
University of Missouri:									

***Table 5:  
Public AAU Institutions: Market Share of Federal Research Expenditures within Each Discipline Area***

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 and other sciences (2.4%) and social sciences (2.5%).

Market share leaders in each discipline area were: Pennsylvania State University in engineering (11.8%), the University of Maryland at College Park in the physical sciences (7.5%), the University of California, San Diego in environmental sciences (16.9%), University of Illinois Urbana-Champaign in math and computer science (16.6%), the University of Washington in life sciences (9.1%), University Wisconsin-Madison in psychology (10.9%), University of Michigan in the social sciences (21.8%) and University of Illinois Urbana-Champaign in other sciences (14.3%).

Table 5. Market Share in Federal R&D Expenditures by Discipline Area Among the Public AAU Institutions, FY 2002

Engi-	Environ-	Math &	Life	Psy-	Social	Other
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## SECTION II: RESEARCH EXPENDITURES FROM INDUSTRY

**Table 6:**  
***Public AAU Institutions: Industry-Sponsored Research Expenditures***

Table 6 shows the growth in industry-sponsored research expenditures for the public AAU institutions from 1990 to 2002 and the gain or loss from 1998 to 2002. The institutions are arranged in descending order based on gain or loss since 1998. Please note that a definition of *industry-sponsored research expenditures* is provided in Section III: Definitions and Technical Notes.

Ohio State University, SUNY at Buffalo, and University of Washington show the largest gains in industry-sponsored research expenditures among the public AAU institutions.

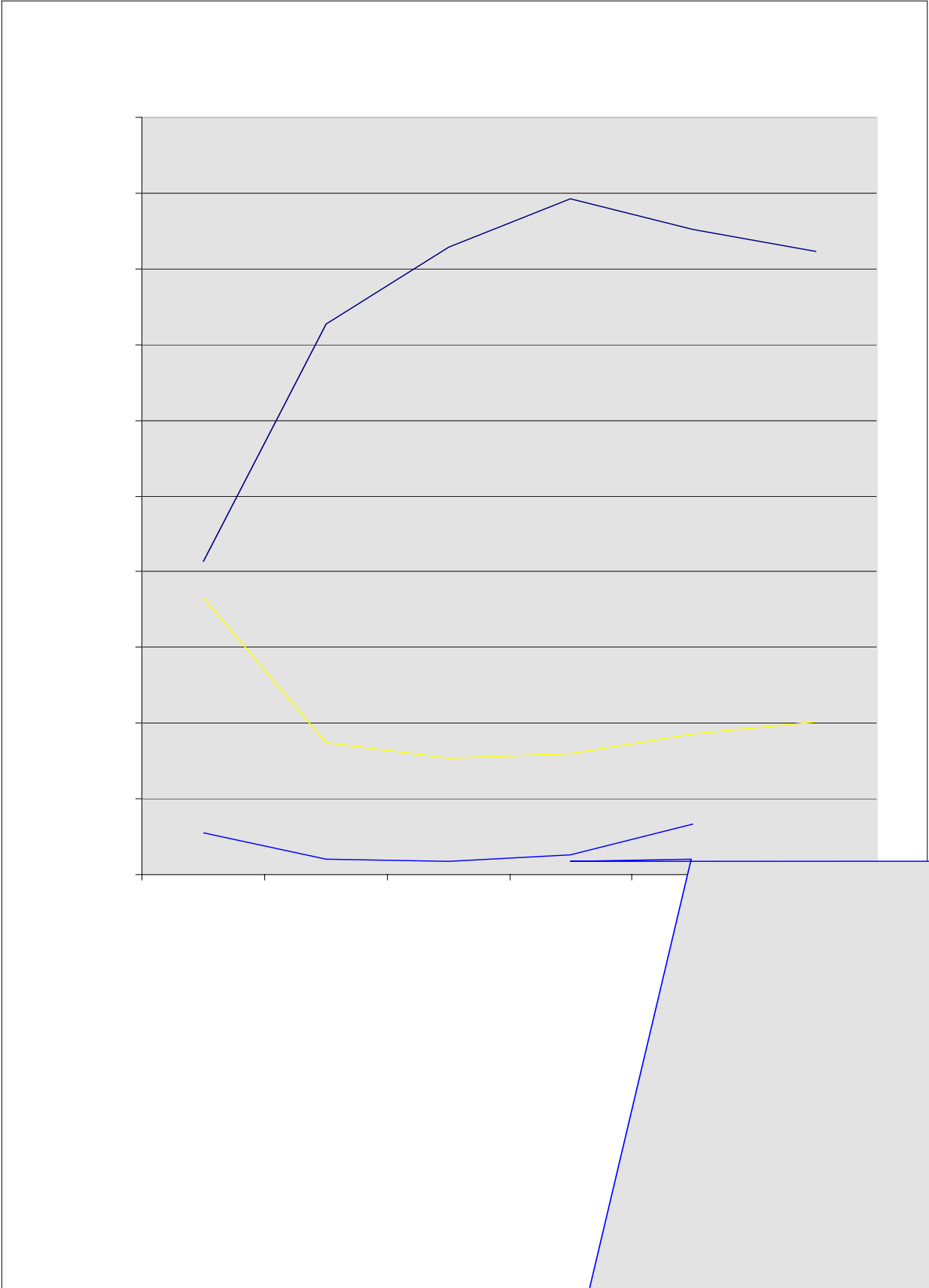
The institutions that lead the public AAU group in terms of industry-sponsored research are Pennsylvania State University (\$67.1 million) and Ohio State University (\$51.1 million)

The University of Missouri secured \$9.8 million in industry-sponsored research expenditures in 2001 and \$10.9 million in 2002.

Table 6. Industry-Sponsored R&D Expenditures at Public AAU Institutions 1990 to 2002

Institution	(\$ in thousands)									\$ Gain/Loss since 1998
	1990	1995	1996	1997	1998	1999	2000	2001	2002	
Ohio State University	14,744	21,827	30,870	36,685	40,401	52,034	57,075	54,736	51,135	10,734
SUNY at Buffalo	2,118	13,390	13,186	14,480	3,021	5,485	5,590	11,598	12,726	9,705
U of Washington	22,215	36,892	36,180	37,744	38,370	51,319	57,405	43,312	46,702	8,332
U CA Santa Barbara	2,655	2,576	2,988	2,876	3,666	4,742	5,499	6,001	10,482	6,816
University of Arizona	10,246	15,300	13,106	14,964	16,392	16,660	22,412	22,934	23,104	6,712
U CA Davis	7,461	8,053	9,387	9,362	14,077	16,242	17,891	16,989	20,754	6,677





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: 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.

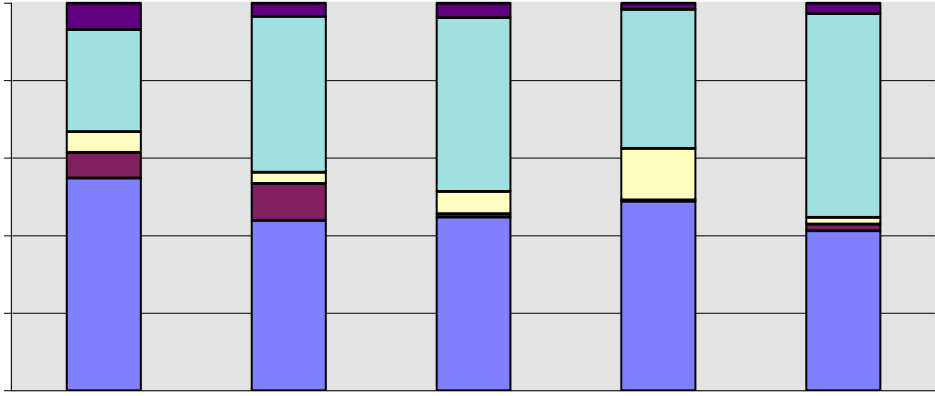
The University of Oregon, the University of Colorado and the University of Virginia, received over 80% of their research expenditures from the federal government, ranking them at the top among the public AAU institutions.

The University of Missouri-Columbia receives 44% of the research funds it receives from the federal government.

The University of Missouri funds a higher percentage of its research program (36% to 52%, depending on campus) with institutional funds than all but one other public AAU institution.

Table 7. Total R&D Expenditures at the Public AAU Institutions by Source of Funds, FY2002

Institution	Federal Gov't	State & Local	Industry	Institutional*	Other	Total (\$ in thousands)
University of Colorado	85%	1%	3%	7%	4%	399,818
University of Oregon	85%	1%	0%	8%	6%	43,723
University of Virginia	84%	1%	5%	5%	5%	182,340
U of Washington	78%	2%	7%	11%	2%	627,273



## 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 be \$1.5 million for FY1993 and \$0.5 million for FY1994. The reporting of expenditures, in contrast to obligations, provides a more accurate picture of an institution’s research performance because it represents funds that have been already spent as compared to funds that have been promised or are expected. Furthermore, expenditure figures are less likely to show major shifts from year to year because funds received for multi-year grants are only reported in the year that they are spent.

*Industry-sponsored research expenditures:* these are funds provided by profit making organizations and expended by the University for research-related purposes. These amounts are reported in the fiscal year that they are expended.

The National Science Foundation has historically reported research obligations and expenditures from a number of different perspectives. In this report, specifically, academic Science & Engineering (S&E) obligations and expenditures for Research & Development (R&D) are examined. Thus, funds received from the federal government for Plant, Facilities & Equipment; Fellowships, Traineeships, and Training Grants; General Support, and for other categories have been excluded. For brevity, "Science and Engineering" and "Research and Development" have not been repeated in the text of this document.

For further clarification, please see “IB99-4: Defining Federal Research Expenditures, Federal Research Obligations, and Federal Research Awards” at the following website:

[http://www.umsystem.edu/planning/Issue\\_Brief/IB99-4.html](http://www.umsystem.edu/planning/Issue_Brief/IB99-4.html).

### **Questions or Comments**

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**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 of Missouri campuses. Specifically, annual growth and market share are reported. Appendix B examines industry-sponsored research expenditures relative to the same group of comparator institutions for each campus. In these tables, annual growth and rank are reported.

**Appendix A**

Federal Research Expenditures for Science and Engineer

## Appendix A continued

UM-Rolla Comparison Group*	(\$ in thousands)					5 Year % +/-
	1998	1999	2000	2001	2002	
Kettering University	192	89	270	270	638	232.3%
SD Sch of Mines & Tech	3,221	3,300	4,127	4,417	6,950	115.8%
<b>U of Missouri Rolla</b>	<b>7,934</b>	<b>8,731</b>	<b>9,804</b>	<b>11,929</b>	<b>15,749</b>	<b>98.5%</b>
Colorado School of Mines	8,694	10,704	11,995	12,314	13,230	52.2%
Clarkson University	3,010	3,694	3,837	4,286	4,286	42.4%
Michigan Tech University	13,938	16,107	16,650	17,620	17,973	28.9%
Rensselaer Polytech Inst	21,774	22,803	25,555	25,894	26,490	21.7%
Worcester Polytech Inst	5,230	4,292	4,219	4,506	5,013	-4.1%
Total	63,993	69,720	76,457	81,236	90,329	
Market Share for UM-Rolla	12.4%	12.5%	12.8%	14.7%	17.4%	

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

UM-St Louis Comparison Group	1998	1999	2000	2001	2002	5 Year % +/-
Wichita State U	2,646	3,260	5,228	5,726	6,687	152.7%
The University of Memphis	5,849	6,364	11,177	11,012	14,072	140.6%
U of Akron	4,042	7,140	7,081	8,672	9,537	135.9%
Florida International U	14,243	15,757	20,296	23,940	32,057	125.1%
University of Toledo	5,366	5,682	6,312	6,701	8,996	67.6%
Wright State University	10,832	12,365	12,543	15,417	16,070	48.4%
U WI Milwaukee	8,936	9,409	8,425	11,089	11,461	28.3%
San Diego State U	19,721	19,724	22,802	23,621	25,223	27.9%
<b>U of Missouri St Louis</b>	<b>3,975</b>	<b>4,841</b>	<b>4,523</b>	<b>4,321</b>	<b>4,755</b>	<b>19.6%</b>
UT-Arlington	11,294	6,089	5,106	9,413	7,848	-30.5%
Total	86,904	90,631	103,493	119,912	136,706	
Market Share for UM-St Louis	4.6%	5.3%	4.4%	3.6%	3.5%	

Source: National Science Foundation/Division of Science Resources Statistics, Survey of Research and Development Expenditures at Colleges and



## Appendix B

