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 2003. 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 2003.

The key findings include:

Federal Research Expenditures

- On average, federal research expenditures at the University of Missouri have increased 63% since 1999 and 277% since 1990. This compares to an increase of 50% and 150%, respectively, at the public AAU institutions (Table 1).

- From 1999 to 2003, the University's market share in federal research expenditures among the public AAU institutions has remained about the same, ranging from 1.47 to 1.60 (Table 2).

- In terms of federal research expenditures, the University of Missouri ranked 27th among the 34 public AAU institutions in 2003. The University held the rank of 31st in 1990 (Table 3).

- Life sciences was the discipline where most of the public AAU universities made the highest percentage of their federal research expenditures (Table 4).

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

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 various years as early as 1990 to 2003. 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 2003 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 for Science and Engineering

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 1990 and 1998.

- On average, federal research expenditures at the University of Missouri have increased 63% since 1999 and 277% since 1990. This compares to an increase of 50% and 150%, respectively, at the public AAU institutions.

Institution	1990	1999	2000	2001	2002	2003	increase since 1990	increase since 1999
U of Nebraska at Lincoln (03 Central Ad)*								

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 1999, 2000, 2002, and 2003.

- Among the public AAU institutions, the market share for the Unive0u4(0usm ()-7.5( )4.5(of Missouri h)3.iases)Tomea

Institution	$	Market Share	$	Market Share	$	Market Share	$	Market Share	Market Share +/- since 1999
University of Pittsburgh	194,618	3.82	228,155	4.12	306,913	4.52	345,625	4.52	0.70
U CA Los Angeles	251,999	4.95	274,162	4.95	366,762	5.40	421,174	5.51	0.57
U of Nebraska at Lincoln (03 Central Ad)*	36,977	0.73	37,831	0.68	51,405	0.76	96,627	1.26	0.54
U CA Davis	124,463	2.44	141,740	2.56	176,644	2.60	208,327	2.73	0.28
U WI-Madison	249,961	4.91	278,629	5.03	345,003	5.08	396,231	5.19	0.28
U CA Irvine	75,505	1.48	88,274	1.59	115,548	1.70	133,873	1.75	0.27
University of Michigan	334,226	6.56	364,033	6.57	444,255	6.54	516,818	6.76	0.20
U of Washington									

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 2003.

- The University of Missouri ranked 27th among the 34 public AAU institutions in 2003. This is an improvement over its 1990 ranking (31st).

	1990			2003	
Rank	Institution	$	Rank	Institution	$
1	U of Washington	203,353	1	U of Washington	565,602
2	U of California-San Diego	182,555	2	U of Michigan	516,818
3	U of Michigan	180,456	3	U of California-Los Angeles	421,174
4	U of Wisconsin-Madison	178,862	4	U of California-San Diego	

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 other public AAU institutions.

- In 2003, the majority of federal research funds expended by the public AAU institutions were in the life sciences (56%) followed by engineering (14%), the physical sciences (11%) and environmental sciences (6%).

- The University of Missouri-Columbia campus very closely mirrored the AAU institution average in life sciences and engineering 74% and10% respectively.

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.

- Market share leaders in each discipline area were: University of Michigan in engineering (10.5%), the University of Arizona in the physical sciences (7.6%), the University of Washington in environmental sciences (15.6%), University of Illinois Urbana-Champaign in math and computer science (20.9%), the University of Washington in life sciences (9.2%), University Wisconsin-Madison in psychology (11.1%), University of Michigan in the social sciences (23.1%) and University of Pittsburg in other sciences (18.0%).

Institution	Engi-neering	Physical	Environ-mental	Math & computer	Life sciences	Psy-chology	Social Sciences	Other sciences	Total ($ in thousands)
U of Washington	4.0	3.2	15.6	2.7	9.2	4.2	2.1	0.0	565,602
University of Michigan	10.5	3.1	1.0	1.7	6.7	4.9	23.1	0.5	516,818
U CA Los Angeles	3.7	4.8	2.2	3.3	7.0	4.3	2.6	9.1	421,174
U CA San Diego	3.0	3.8	14.6	12.3	4.8	2.9	1.4	0.0	400,100
U WI-Madison	5.5	4.0	7.4	3.0	5.0	11.1	6.5	0.0	396,231
University of Colorado	2.2	7.0	12.5	1.7	4.9	4.5	3.0	4.8	377,941
University of Pittsburgh	1.0	1.8	0.1	1.1	7.0	3.4	1.6	18.0	345,625
Pennsylvania State U	10.1	4.9	4.8	4.4	2.0	5.4	3.3	8.0	301,094
University of Minnesota	2.5	2.4	1.2	3.1	5.0	4.5	2.6	0.0	293,266
U of NC Chapel Hill	0.0	2.0	2.4	2.1	5.1	2.9	6.3	0.0	280,678
U of IL Urbana-Champaign	6.0	3.9	2.7	20.9	1.3	3.5	1.4	12.2	266,487
University of Arizona	2.5	7.6	1.4	1.7	3.3	1.3	3.3	0.2	259,074
U CA Berkeley	5.8	7.1	1.1	1.7	2.1	4.2	2.2	2.4	238,206
U TX at Austin	7.3	6.2	2.1	8.9	0.7	3.5	3.9	15.6	231,996
U CA Davis	1.7	1.7	2.5	0.9	3.6	0.3	1.0	3.6	208,327
Ohio State University	2.9	2.2	1.1	1.4	2.7	2.7	5.0	3.1	198,488
U of Iowa	1.0	1.7	0.2	0.4	3.8	2.4	0.4	0.0	197,260
University of Florida	3.5	2.3	0.8	1.7	2.8	3.3	0.6	0.0	194,958
U MD at College Park	4.3	5.2	1.8	5.2	0.7	2.1	9.5	0.0	183,206
Texas A&M University	3.6	2.0	12.3	2.7	1.1	1.1	0.5	0.2	177,119
University of Virginia	2.2	1.7	0.5	1.5	2.8	3.1	0.4	0.6	173,442
Indiana University	0.1	2.1	0.3	1.7	2.6	4.0	2.4	0.7	153,625
U CA Irvine	1.0	1.8	0.6	1.5	2.2	1.7	1.2	0.1	133,873
Michigan State University	0.7	3.7	0.1	1.1	1.7	2.2	3.9	2.1	133,820
SUNY at Buffalo	1.7	1.0	0.1	1.0	2.2	1.4	0.4	0.1	129,794
Purdue University	3.8	1.8	0.4	1.9	1.3	1.8	1.5	2.3	129,199
SUNY at Stony Brook	0.9	2.3	2.5	1.6	1.4	1.3	0.3	0.0	112,452
Rutgers the State U NJ	1.3	1.6	2.4	1.9	1.2	2.5	1.0	0.0	106,060
U of Nebraska at Lincoln (03 Central Ad)*	0.7	0.9	0.7	1.0	1.5	2.7	1.5	7.4	96,627
University of Kansas	0.7	0.6	0.5	0.2	1.6	0.6	1.4	4.3	90,876
U CA Santa Barbara	2.9	2.4	2.4	2.4	0.1	3.1	1.7	1.3	88,422
University of Missouri-Columbia	0.7	0.3	0.2	0.5	1.5	2.1	1.5	0.0	84,211
Iowa State University	2.0	0.8	0.7	1.1	0.9	0.1	2.6	3.2	82,297
University of Oregon	0.1	2.1	0.6	1.6	0.1	1.1	0.0	0.1	36,127
Public AAU Institution Distribution	1,100,364	820,506	490,445	419,845	4,260,720	189,872	300,479	22,244	7,604,475

Source: National Science Foundation/Division of Science Resources Statistics, Survey of Research and Development Expenditures at Colleges and University, FY 2003, B-37.

*U of Nebraska at Lincoln is reported for previous years, but for 2003, only U of Nebraska Central Administration data was available and is reported here.

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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 2003 and the gain or loss from 1999 to 2003. The institutions are arranged in descending order based on gain or loss since 1999. Please note that a definition of *industry-sponsored research* [illegible]

Table 6. Industry-Sponsored R&D Expenditures at Public AAU Institutions for 1990, 1999-2003

Institution	1990	1999	2000	2001	2002	2003	$ Gain/Loss since 1990	$ Gain/Loss since 1999
University of Arizona	10,246	16,660	22,412	22,934	23,104	31,079	20,833	14,419

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 Colorado, received 87% of their research expenditures from the federal government, ranking them at the top among the public AAU institutions.

- The University of Missouri-Columbia receives 41% of the research funds it receives from the federal government.

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Table 7. Total R&D Expenditures at the Public AAU Institutions by Source of Funds, FY2003

Institution	Federal Gov't	State & Local	Industry	Institu-tional*	Other	Total ($ in thousands)
University of Colorado	87%	2%	2%	5%	4%	436,761
University of Pittsburgh	84%	3%	1%	6%	6%	409,684
University of Virginia	84%	0%	4%	6%	5%	206,199
U of Washington	83%	2%	7%	6%	2%	684,814
University of Oregon	81%	1%	1%	10%	7%	44,604
U of NC Chapel Hill	72%	4%	2%	22%	0%	390,542
U of Iowa	68%	3%	7%	19%	4%	292,035
U TX at Austin	67%	6%	9%	12%	5%	343,854
University of Michigan	66%	2%	5%	20%	7%	780,054
U CA San Diego	62%	4%	4%	19%	11%	646,508
U CA Santa Barbara	59%	2%	9%	18%	12%	149,130
University of Minnesota	58%	12%	5%	14%	12%	508,557
U CA Irvine	57%	5%	5%	21%	12%	234,656
University of Arizona	57%	4%	7%	28%	5%	454,941
U MD at College Park	57%	6%	3%	31%	3%	321,899
Pennsylvania State U	56%	11%	15%	18%	0%	533,427
SUNY at Stony Brook	56%	2%	2%	32%	7%	200,330
U WI-Madison	55%	6%	2%	28%	10%	721,248
SUNY at Buffalo	54%	3%	4%	28%	10%	240,180
U of Illinois Urbana-Cham	54%	11%	3%	29%	4%	493,581
University of Kansas	53%	4%	2%	36%	6%	173,024
U CA Los Angeles	50%	8%	4%	24%	14%	849,357
U CA Berkeley	47%	7%	4%	28%	14%	507,186
Indiana University	45%	1%	2%	37%	14%	337,669
University of Florida	45%	17%	6%	29%	4%	429,734
U CA Davis	43%	8%	5%	34%	10%	482,145
Purdue University	42%	14%	11%	33%	0%	309,476
Michigan State University	42%	18%	4%	33%	4%	321,410
Iowa State University	41%	21%	7%	29%	1%	199,566
Ohio State University	40%	2%	9%	38%	11%	496,438
Texas A&M University	39%	25%	6%	28%	3%	456,235
Rutgers the State U NJ	39%	13%	4%	35%	10%	274,576
U of Nebraska at Lincoln (03 Central Ad)*	35%	3%	5%	50%	7%	276,424
Public AAU Institution Average**	57%	7%	5%	24%	7%	
University of Missouri:						
Columbia	41%	11%	2%	43%	3%	205,212
Kansas City	46%	0%	4%	45%	5%	31,105
Rolla	50%	1%	10%	34%	5%	35,998
St Louis	39%	1%	2%	52%	7%	12,818
University Average	44%	3%	5%	44%	5%	

Source: National Science Foundation/Division of Science Resources Statistics, Survey of Research and Development Expenditures at Colleges and University, FY 2003, B-30. Office of Sponsored Programs, Samuel Peterson for UM Campuses.

*U of Nebraska at Lincoln is reported for previous years, but for 2003, only U of Nebraska Central Administration data was available and is reported here.

**AAU average excludes U of Missouri-Columbia.

Institutional funds include: 1) institutionally financed funds and 2) unreimbursed costs.

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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/ums/departments/fa/planning/researchfunding/briefs/briefsib994.shtml.

Questions or Comments

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