



Research
and Graduate
Programs
2000 Annual
Report





The 21st century economy demands rapid progression from the laboratory to the market and the University of Florida's research enterprise is evolving to meet that challenge. While UF continues to operate at the cutting edge of basic research, funded primarily by the federal government, it also is working more with industry and foundations to find ways to make basic research available for the public good.

Nowhere is this evolution more apparent than in our efforts to understand the brain and central nervous system. During the past decade, the university has received more than \$60 million from the federal government to build and equip a state-of-the-art brain research facility. Last year, the university received a \$15 million gift from the McKnight Brain Research Foundation, matched by \$15 million from the State of Florida, to apply basic research to the more specific problem of memory loss during aging.

An examination of UF's research funding during the past decade illustrates this move toward a dual basic/applied research emphasis in all areas of the university. As recently as the 1990-91 fiscal year, barely a fifth of the university's research funding came from industry and foundations. But in 1991-2000, those two areas accounted for nearly a third of our total support.

The growth in revenue from licensing UF technologies also illustrates the important role applied research plays at the university. The record \$26.7 million in licensing revenue the University of Florida Research Foundation received last year is nearly a five-fold increase over the \$5.5 million generated in 1994-95.

This evolution is also apparent in our graduate education programs. Students are able to enhance their marketability and scholarship through a host of innovative programs, including combined bachelor's/master's degrees; joint graduate/professional degrees or two graduate degrees in different programs; and new interdisciplinary professional graduate degrees such as the Doctor of Audiology, Doctor of Plant Medicine and Master of Public Health.

Our faculty, staff and students have shown themselves to be remarkably adaptable to the changing research and graduate education environment. The Office of Research and Graduate Programs seeks to be equally flexible, facilitating the research and education that makes UF one of the nation's premier research universities.

Sincerely,

Win Phillips
Vice President for Research
Dean of the Graduate School



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University of Florida faculty and staff worked for nearly 40 years, beginning with the first significant research grants in the mid 1940s to 1986 to surpass \$100 million in funding. In the last 14 years the university has more than tripled that figure, receiving a record \$339.4 million in fiscal year 1999-2000.

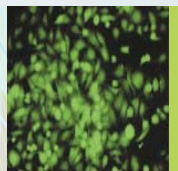
"The dramatic gains the University of Florida has made in securing research contracts and grants are both a cause and an effect of UF growth into the ranks of America's premier research universities," said Win Phillips, UF's vice president for research. "This success is testimony to the quality of research and education being conducted by our faculty."

Like most major U.S. universities, UF has historically relied on awards from the federal

government for the bulk of its research funding. And while the record \$175.1 million in federal awards still accounted for 51 percent of UF's FY2000 total, awards from industry and private foundations now account for nearly a third (32 percent). Five years ago federal awards were 57 percent of the total and industry and foundation awards were only 21 percent.

Bolstered by a \$15 million grant from the McKnight Brain

Research Foundation to the UF Brain Institute, foundation awards rose 69.4 percent to a record \$60.3 million. Other major foundation awards included a \$639,000 grant from the Smith Richardson Foundation to the College of Education to evaluate Florida's Opportunity Scholarship program and a \$510,000 grant from the Andrew W. Mellon Foundation to the Warrington College of Business to trace linkages between universities and businesses.



Across campus, dozens of UF researchers affiliated with the UF Genetics Institute are delving into the genetic codes of a host of living things.

Much of the institute's research focuses on functional genomics — figuring out which gene is assigned to do which job.

The institute's new DNA Microarray Facility is vital to this research. The facility focuses on the development of DNA chip technology, which allows scientists

to explore the activity of thousands of genes at once rather than individually.

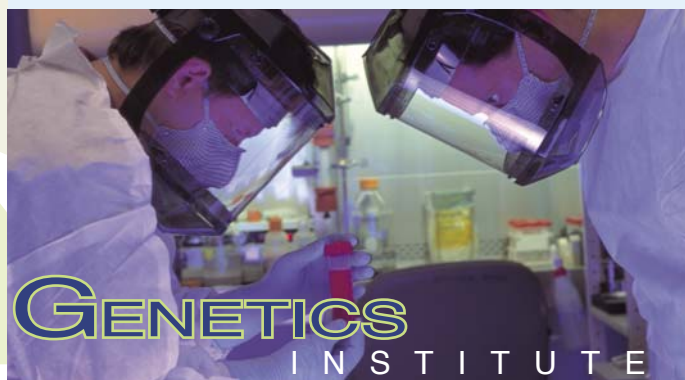
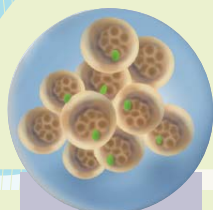
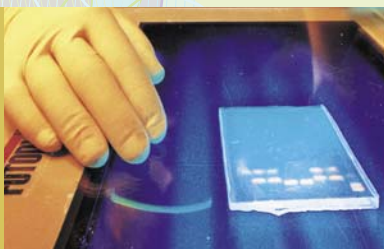
One method for determining a gene's role is to package it in a "vector," insert it into an animal, then analyze what happens.

Among the most popular vectors is the adeno-associated virus (AAV), which was developed for gene therapy use at UF. Unlike some other vectors, AAV has not been linked to any side effects. The university is now developing a stock of AAV that will serve as the national standard.

Researchers are optimistic that in the next few years, promising animal work in a number of disorders will advance to the clinical trial stage. Among the conditions on which gene therapy may soon be tried:

Retinitis pigmentosa, a common, inherited form of blindness; spinal cord injury; hypertension; Alpha-1 antitrypsin deficiency, which is associated with the development of early emphysema and severe liver disease; obesity; infections; and heart attack.

www.mgm.ufl.edu



GENETICS
INSTITUTE

The Health Science Center continues to lead in UF research funding, bringing in a record \$173.8 million in 1999-2000, a 16.9 percent increase over the previous year. In addition to the McKnight award, other major Health Science Center awards included \$973,000 from the U.S. Army to the College of Medicine to study cell death following traumatic brain injury and \$450,000 to the College of Health Pro-

fessions from the National Institutes of Health to study treatments for children with behavior problems.

The College of Engineering also enjoyed an excellent year, with awards climbing 14.4 percent from 1998-99 to a record \$50.1 million. The College of Liberal Arts and Sciences gained 9.5 percent to \$30.1 million and the Institute of Food and Agricultural Sciences increased 3.6 percent to \$51.2 million. As testament to

the diversity of UF's research enterprise, awards to all other colleges and units of the university were up 28.6 percent from 1998-99 to \$34.2 million.

UF's technology transfer efforts continue to benefit from the research enterprise. In the last five years royalty and licensing income from UF-developed intellectual property has grown by 139 percent from \$11 million in 1995-96 to a record \$26.3 million in 1999-00. The glaucoma drug Trusopt™ and

the sports drink Gatorade™ lead all technologies, accounting for more than 84 percent of the total. Aggressive marketing of other UF technologies pushed their revenues to more than \$4 million in 1999-00, a 56.6 percent increase over the previous year.

The resulting income is distributed, in large measure, to faculty, departments, centers and colleges in support of research. It also supports the UFRF enterprise.



Summary of Sponsored Research Activity FY 1999-2000

| | |
|--|---------------|
| Proposals Submitted | 4,058 |
| Grant and Contract Dollars Requested | \$471,998,565 |
| Awards Received | 4,791 |
| New Awards Received | 1,791 |
| Continuations or Supplementals | 2,678 |
| Grant and Contract Dollars Awarded | \$300,606,963 |
| Gifts for Research | \$38,825,962 |
| Total Sponsored Research Funding | \$339,432,925 |
| Grant and Contract Direct Expenditures | \$257,880,888 |
| Recovered Indirect Cost Expenditures | \$36,865,197 |
| Grant and Contract Dollars Expended | \$294,746,085 |
| Projects Active During the Fiscal Year | 5,304 |
| Faculty Receiving Awards | 1,750 |
| Sponsors | 927 |



The Institute on Aging, chartered in 1999, continues a half century of aging-related research and education at the University of Florida. As the largest university in the state with the largest proportion of its population over 65, UF is uniquely positioned as a national leader in this field.

The institute fosters multidisciplinary research, education

and service, stimulates increased funding and influences public policy. It is guided by a strong core of more than 25 faculty, from diverse disciplines such as basic and clinical psychology, geography, medicine, nursing, rehabilitation science and sociology. This core, with extensively funded research, is committed to advancing the science and practice of aging at UF.

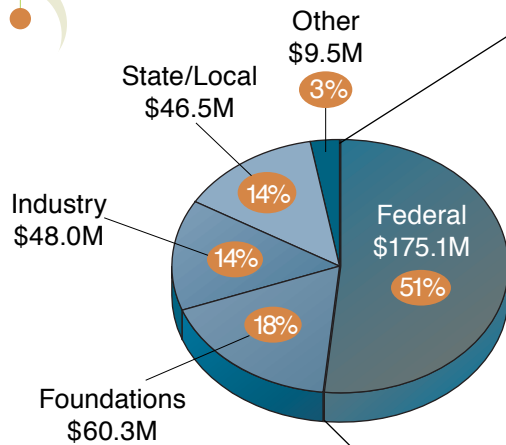
The more than 300 faculty associated with the institute represent social sciences and humanities, as well as biomedical and clinical fields. This equal emphasis on the psychosocial and biomedical aspects of aging

is fairly unique in academic aging institutions nationally.

The institute focuses on "aging well," by identifying programs and interventions that can contribute to the active and healthy life of an older individual.

"These efforts really seek to point out that when you hit the age of 60 you are as likely to live another 20 years — most of it healthy and active — as you are to have health problems, but this is not a widely held perception yet in the public," says Jeffrey W. Dwyer, Ph.D., a national leader in gerontology research and health policy who is director of the institute.

ReSEARCH OverVIEW



**Research Awards by Sponsor
FY 1999-2000**

Federal Awards by Agency

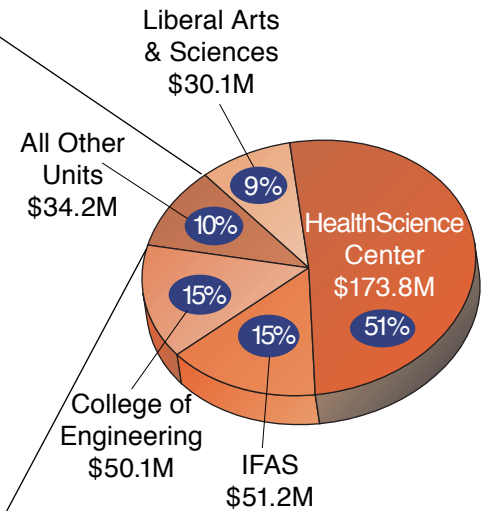
| | |
|--------------------|--------|
| NIH | \$69.7 |
| NSF | \$20.7 |
| USDA | \$13.3 |
| DOD | \$12.1 |
| Education | \$9.0 |
| HRS Administration | \$8.9 |
| Energy | \$7.9 |
| Veteran's Affairs | \$5.5 |
| DOT | \$5.2 |
| Commerce | \$4.6 |
| EPA | \$4.0 |
| NASA | \$3.5 |
| Other Federal | \$3.3 |
| Other HHS | \$2.7 |
| US AID | \$2.4 |
| Dept. of Labor | \$1.3 |
| HHS | \$1.0 |

Total \$175.1M

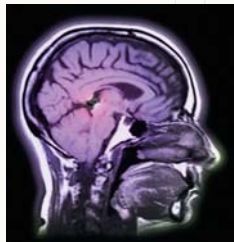
Other Academic Units

| | |
|-----------------------------------|--------|
| Academic Affairs | \$4.11 |
| Business Administration | \$5.9 |
| Design, Construction & Planning | \$4.5 |
| Centers & Institutes | \$4.5 |
| Continuing Education | \$0.2 |
| Education | \$6.0 |
| Fine Arts | \$0.08 |
| Florida Museum of Natural History | \$1.11 |
| Health & Human Performance | \$0.7 |
| Journalism & Communications | \$0.7 |
| Law | \$3.2 |
| Libraries | \$0.4 |
| Instructional Resources | \$1.9 |
| Research & Graduate Programs | \$0.9 |

Total \$34.2M



**Research Awards by Major
Academic Unit FY 1999-2000**



The McKnight Brain Institute is the centerpiece of a campus-wide research effort that involves some 270 faculty members and has produced dramatic results in such areas as spinal cord regeneration and gene therapy.

The tools housed in the institute's state-of-the-art building are expected to dramatically enhance efforts to develop new approaches to treating, curing or preventing central nervous system disorders, which are estimated to afflict

one in five Americans and cost \$500 billion a year.

"To the best of my knowledge, there is no other academic program anywhere with this breadth and magnitude of multidisciplinary talent focused on the central nervous system," says institute Director William Luttge, Ph.D.

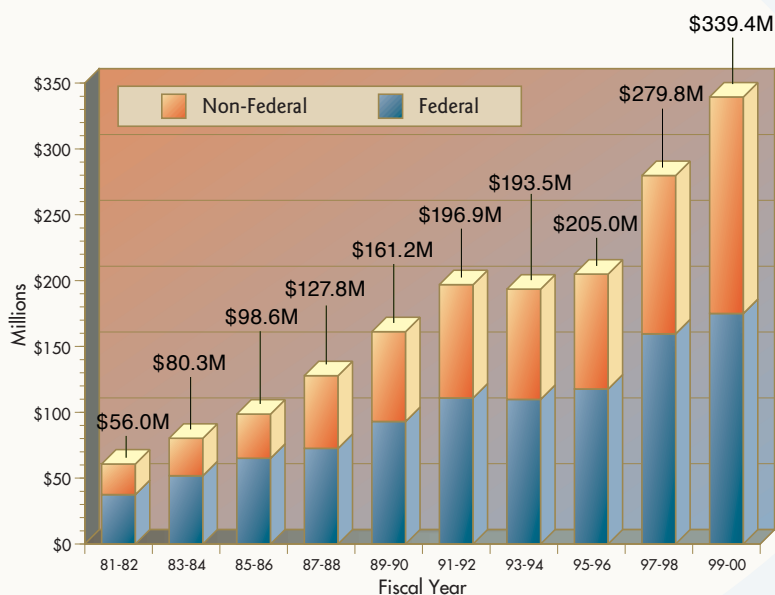
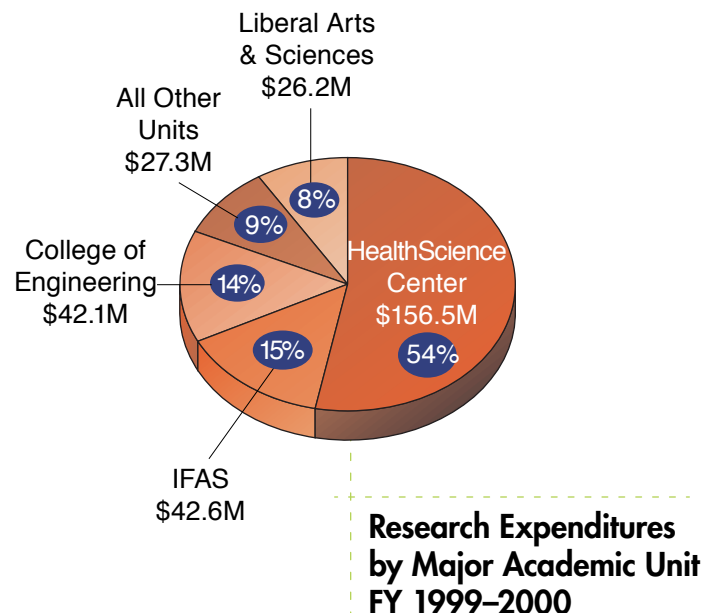
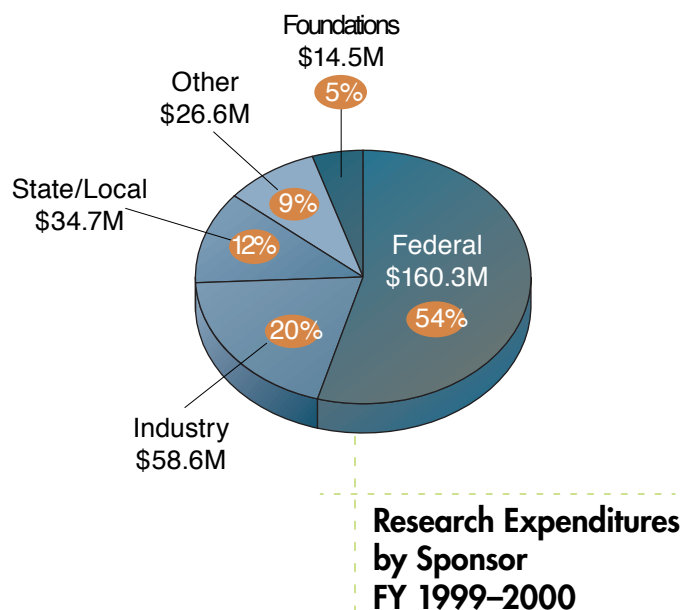
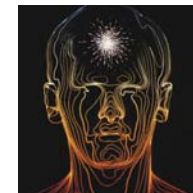
The institute is home to some of the world's most powerful magnetic resonance imaging scanners; an array of microscopes that capitalize on recent breakthroughs in using dyes, fluorescent probes, lasers and computer-assisted image pro-

cessing; a linear accelerator to study and deliver precision radiation therapy deep within the brain; and multimedia and computer technology that will allow faculty to project brain dissection images onto multiple computer screens or enable physicians to transmit brain scans of hospitalized patients to their office computers.

These tools will help researchers develop better tumor destruction strategies, see more clearly what prevents an injured spinal cord from regenerating, understand what is happening biochemically in the brain of



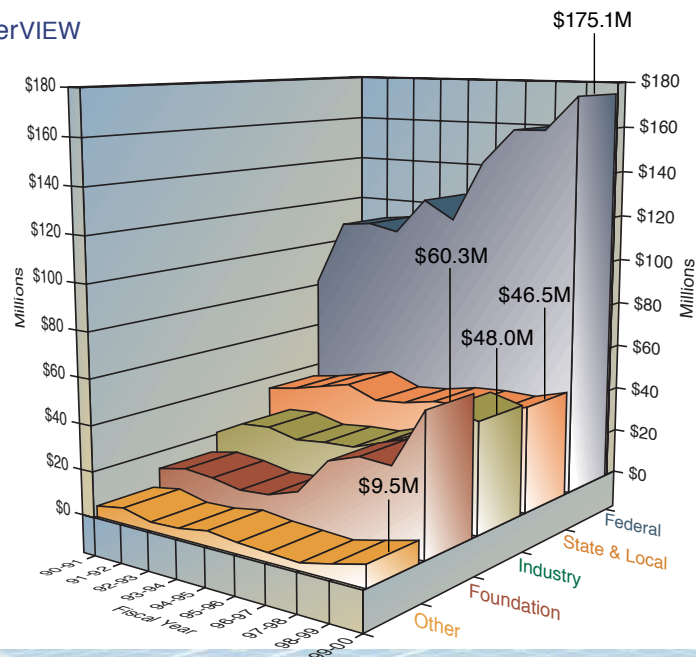
someone with Alzheimer's disease and get a better view of what might be amiss in someone afflicted with depression.



Sponsored Research Awards Federal/Non-Federal FY 1982-2000

In the last 20 years, total sponsored research awards have grown nearly 500 percent. In FY 1999-00, federal sponsorship exceeded \$175 million, a figure that has more than doubled in the last decade. Non-federal sponsorship grew 24.5 percent to \$164.4 million in 1999-00, also more than double the FY 1989-90 level.

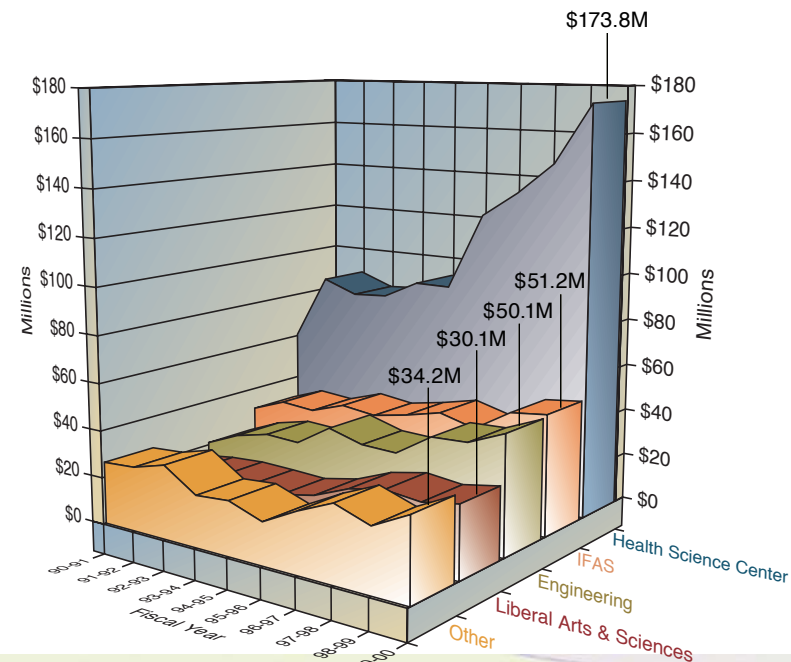




**Research
Awards by
Sponsor Type
FY 1991-2000**

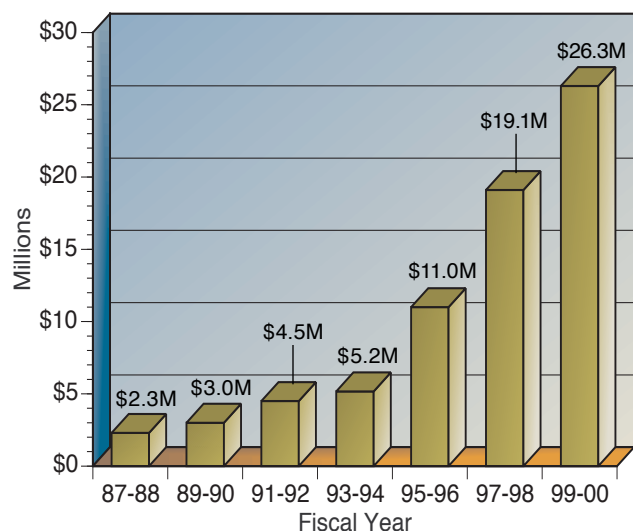
A dramatic increase in foundation support boosted UF to record totals in 1999-00. Foundation funding increased 69.4 percent to a record \$60.3 million. A \$15 million grant from the McKnight Brain Research Foundation accounted for more than half of that increase.

The National Institutes of Health (NIH) and the National Science Foundation (NSF) accounted for 51 percent of the record \$175.1 million in UF federal awards. Funding from other sources (non-SUS universities, foreign donors and individuals) was up 53.2 percent to \$9.5 million.



**Research
Awards by
Major Academic
Unit FY 1991-2000**

Awards to the health sciences reached a record \$173.8 million in 1999-00, a 16.9 percent increase over the previous year. Awards to the College of Engineering surpassed \$50 million, up 14.4 percent from the previous year. Awards to the College of Liberal Arts and Sciences were up 9.5 percent to \$30.1 million. The Institute of Food and Agricultural Sciences (IFAS) saw a modest 3.6 percent increase from the previous year, reaching \$51.2 million in 1999-00. The \$34.2 million for all other academic units in FY 1999-00 represented a 28.6 percent increase from last year.



Patent & Licensing Activity FY 1991–2000

| Fiscal Year | Invention Disclosures Received | U.S. Patent Applications Filed | U.S. Patents Issued | Licenses Generating Royalties |
|-------------|--------------------------------|--------------------------------|---------------------|-------------------------------|
| 1999/00 | 166 | 122 | 52 | 63 |
| 1998/99 | 134 | 106 | 51 | 49 |
| 1997/98 | 139 | 68 | 51 | 58 |
| 1996/97 | 103 | 101 | 47 | 61 |
| 1995/96 | 90 | 61 | 34 | 69 |
| 1994/95 | 84 | 100 | 24 | 64 |
| 1993/94 | 75 | 66 | 45 | 20 |
| 1992/93 | 90 | 41 | 45 | 46 |
| 1991/92 | 74 | 34 | 50 | 35 |
| 1990/91 | 105 | 45 | 40 | 18 |

Note: Data for patent applications filed and patents issued include new filings, continuations-in-part (CIP), continuations, divisionals, and reissues.

Technology Transfer and Licensing FY 1987-1999

In 1999-00, royalty and licensing income rose to a record \$26.3 million. The income generated came primarily from Trusopt™, a glaucoma drug licensed to Merck Pharmaceuticals, which accounted for 58 percent. The sports drink Gatorade™, licensed to Quaker Oats, continues to account for a significant 26 percent. License fees, option payments and royalties from other technologies rose 25.4 percent in 1999-00 to a record \$4 million. The most recent survey by the Association of University Technology Managers (AUTM) ranked UF 8th among all U.S. universities in licensing income.

UF's Office of Technology Licensing has an active program to assist faculty members in patenting and licensing their discoveries for the mutual benefit of all parties. During the past year, the number of invention disclosures received rose nearly 24 percent, U.S. patents filed increased more than 15 percent and licenses generating royalties increased nearly 29 percent to 63.

The Engineering Research Center for Particle Science and Technology is a collaboration between the University of Florida, the National Science Foundation and numerous industry partners. The center was established in 1994 to address the need for engineers and scientists trained in particle science technology, which impacts more than \$1 trillion in industrial output annually.

Particle handling is a core technology for a wide variety of industries, from the environment to food processing,

The ERC seeks to advance understanding of particulate systems by creating and demonstrating the scientific and

technological feasibility of innovative particulate processing systems; facilitating the transfer of research discoveries between the ERC and industry; and developing an interdisciplinary education program that will produce well-prepared scientists and engineers in the field.

Examples of technologies that have advanced through the center are:

An atomic flux coating process capable of coating organic or inorganic particles down to micron size. This technology has been applied to the generation of nano-thin biodegradable coatings on drug particles for pulmonary drug delivery systems.



A cost-effective, environmentally friendly drinking technology.

A process for coating filter media with metal hydroxides, resulting in the effective removal of viruses and bacteria from aqueous streams.

www.erc.ufl.edu

GRADUATE PROGRAMS INTERVIEW



During a period of flat or declining graduate enrollment nationwide, the University of Florida continues to show impressive graduate enrollment growth, thanks to a strong institutional commitment in the form of financial support and innovative new programs.

A recent survey by the Council of Graduate Schools found that graduate enrollments showed only a 1 percent increase between 1986 and 1998 and a 1 percent

decrease between 1997 and 1998. Counter to this trend, graduate enrollment at UF increased 9.5 percent between Fall 1998 and Fall 1999 following a 9 percent increase the previous year.

Fall 1999 graduate enrollment was 8,231 with 2,834 doctoral students and 5,397 master's students. From August 1999 through May 2000, the university awarded 595 doctoral degrees and 2,113 master's degrees.

UF's commitment to attracting the nation's finest graduate stu-

dents is reflected in the \$61 million in stipends and tuition provided last year through Alumni Graduate Fellowships, Named Presidential Fellowships, Grinter Fellowships, Graduate Minority Fellowships, and research, teaching and graduate assistantships.

In response to student and industry demands, along with marked advances in technology and research, the Graduate School approved 13 new programs, concentrations and certificates. The university now offers more than 200 graduate



McKnight Brain INSTITUTE



A new software program developed by University of Florida doctoral students Didem Gökçay and Cécile Mohr helps researchers more precisely map brain activities, which is expected to help make brain surgery more exact and improve rehabilitation of people with brain disease or injury.

"The cerebral cortex is a crumpled structure made up of bumps and grooves," said Gökçay, a doctoral student in computer and information sciences who conducted her research at UF's Brain Institute. "Think of frying a piece of bacon or crumpling a piece of paper. The results will look different each time. The crumples across brains are not the same, and their shapes and sizes can be very different as well."

Gökçay's program provides researchers with an easy, flexible tool for tracing sections of the twisting, turning, three-dimensional cortex where two-thirds of brain function takes place.

degree programs supported by 2,514 graduate faculty. Students are able to enhance their marketability and scholarship through innovative programs such as the combined bachelor's/master's degree programs, which permit up to 12 hours of graduate-level course work to be counted for both degrees.

Joint degrees lead to a graduate degree and a professional degree or two graduate degrees in different programs, allowing a specified number of credits to dual count for

both degrees. Students also can choose to pursue two graduate degrees concurrently on an individualized basis. In addition to shortening the time it takes to earn their degrees by a full semester, these students are able to combine research disciplines to examine contemporary issues from a unique perspective.

Colleges and departments have also partnered to offer three new interdisciplinary professional graduate degrees for the Doctor of Audiology, Doctor of Plant Medicine and

Master of Public Health. The AuD degree program, taught by graduate faculty in the Colleges of Liberal Arts and Sciences and Health Professions can be attained via distance learning or in the traditional campus environment.

The Colleges of Health and Human Performance, Health Professions, Medicine, and Pharmacy are offering the MPH degree in collaboration. Although students apply to this program through one of the colleges, they are able to choose from a wide variety

of courses and benefit from a diverse faculty from all the colleges to correspond with their research interests.

Graduate faculty from six departments in the College of Agricultural and Life Sciences have teamed up to offer the new Doctor of Plant Medicine degree program, developed to meet the growing needs of farmers and horticulturists.

Demographically, graduate students at the University of Florida continued to include more minority students and women. Asian/Pacific Island

enrollment increased 6.4 percent, African-American enrollment increased 15.95 percent and Hispanic enrollment increased 15.8 percent. Enrollment of women was up 11 percent to 3,757 and females now comprise 45 percent of the graduate student population.

UF is a national leader in the development of electronic theses and dissertations (ETD). After conducting a successful pilot program for the last three years, graduate students admitted for Fall 2001 will be required to submit their theses and dissertations through the ETD program. Among the benefits of ETDs are greater accessibility to scholarship, opportunities to include multi-media, and cost/space savings for libraries. The Graduate School is working with the Office of Instructional Resources and the Smathers Libraries to provide editorial, technical and archival support for the ETD program.



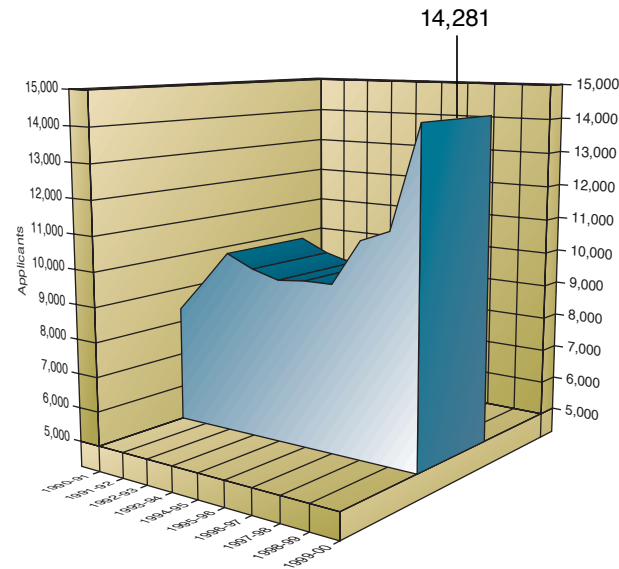
"Through the Genetics Institute I have been provided with extraordinary opportunities that an otherwise unaffiliated student may not have. The Genetics Institute provides a forum for researchers from all areas of molecular genetics research to come together. In this environment new ideas and critical views are discussed among individuals who study bacteria, plants, animals and human genetics."

Thomas J. Conlon
Doctoral Candidate
Department of Pediatrics &
Molecular Genetics

"The traditional degree programs allow students to build specific knowledge in a field, but in my experience, the Engineering Research Center has supplemented this experience with a working knowledge of the critical issues and processes governing fields significantly different from my own."

Joshua J. Adler
Graduate Research
Assistant
Engineering Research
Center for Particle
Science & Technology
and Department of
Materials Science &
Engineering





Graduate Applicants 1991-2000

During 1999-2000, the university received 14,281 graduate applications and offered admission to 6,885. Compared to 1998-99, applications increased by 25 percent and acceptances grew by 22 percent.



INSTITUTE on Aging



"My interest in the field of aging stems from the importance of my grandparents in my life and from the number of older adults in Florida," says sociology graduate student Carmen Schmitt. "I am upset by the widespread ageism. In a society where life expectancy is increasing, we must challenge ageist attitudes and work to make growing old a positive experience."

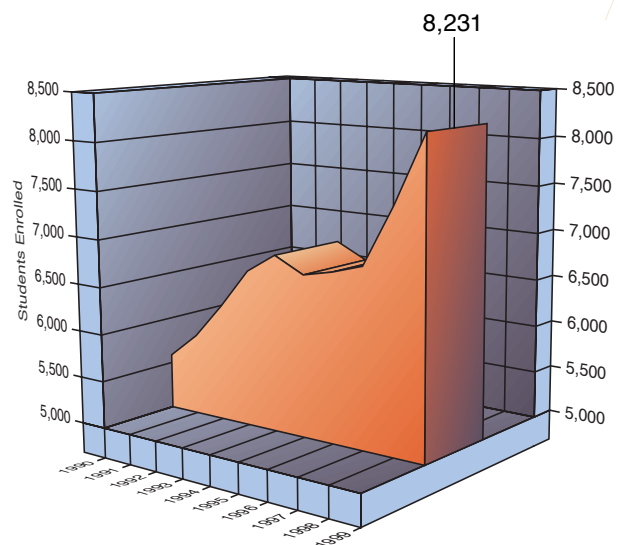
Schmitt's research into the factors that contribute to the happiness and well-being of people in nursing homes was recently rewarded with a prestigious Andrus Foundation Scholarship from the Association for Gerontology in Higher Education in recognition of her potential to contribute to the field of aging.

Schmitt's undergraduate thesis, "Quality of Life in the Sunny Day Nursing Home," was based on her experiences as a participant observer at a nursing home, where she drew inferences about residents' happiness, sense of independence and other feelings of well-being.

"Measures of well-being in nursing homes usually focus on physical health and nutritional status," says Schmitt. "I wanted to know more about the residents' emotions, in hopes of learning how nursing homes can be improved."

Schmitt earned her BA with highest honors and a certificate in gerontology from UF in December 1999. She is now working toward graduate certification in gerontology and a master's degree in sociology.





Graduate Enrollment Fall 1990-1999

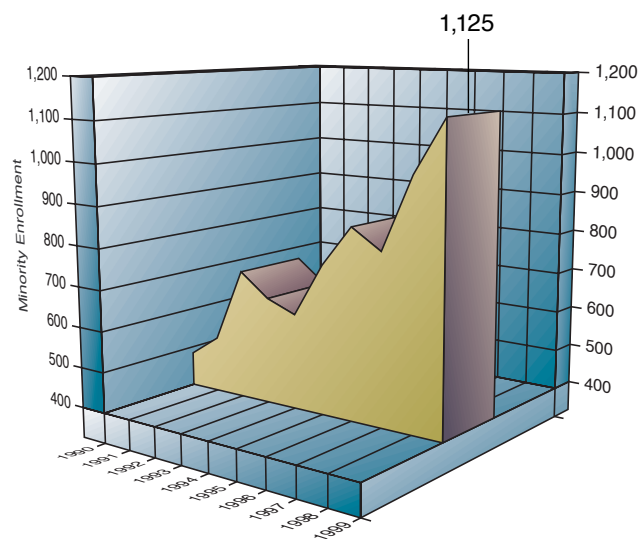
A record graduate student enrollment of 8,231 in Fall 1999 reflects the university's efforts to increase graduate enrollment by providing more financial support to colleges and departments and by offering innovative programs.



Graduate Enrollment by College/School, 1999-2000

| College/School | Graduate Enrollment | College/School | Graduate Enrollment |
|---------------------------------|---------------------|---------------------------------|---------------------|
| Accounting | 184 | Health & Human Performance | 229 |
| Agriculture & Life Sciences | 701 | Journalism & Communications | 210 |
| Building Construction | 57 | Law | 78 |
| Business Administration | 684 | Liberal Arts & Sciences | 1,604 |
| Dentistry | 27 | Medicine | 330 |
| Design, Construction & Planning | 258 | Natural Resources & Environment | 22 |
| Education | 1,013 | Nursing | 285 |
| Engineering | 1,643 | Pharmacy | 67 |
| Fine Arts | 166 | Veterinary Medicine | 63 |
| Forestry | 50 | Special Programs* | 331 |
| Health Professions | 220 | | |

*Programs offered through more than one college.



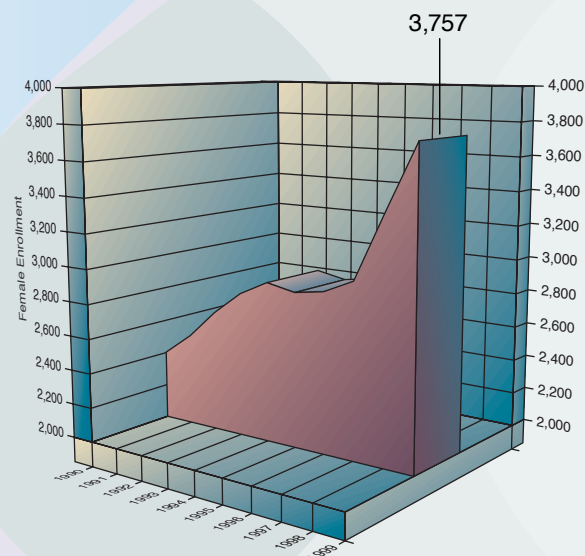
Total Minority Enrollment Fall 1990-1999

African American enrollment increased by 15.9 percent between 1998 and 1999, and Hispanic American enrollment grew by 15.8 percent. Enrollment for Asian Americans and Native Americans grew by 6.4 and 10.5 percent, respectively.



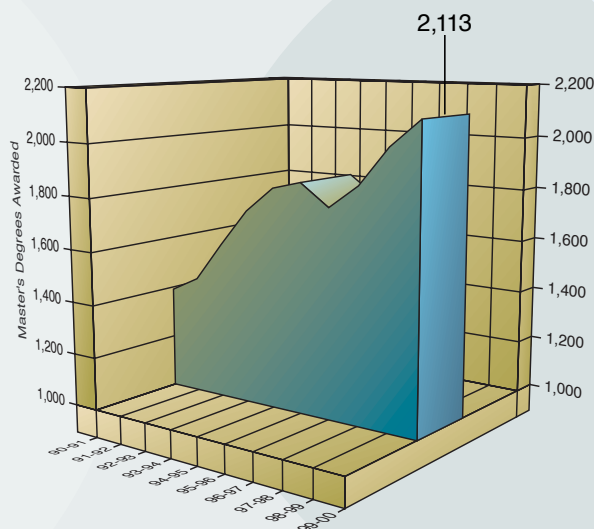
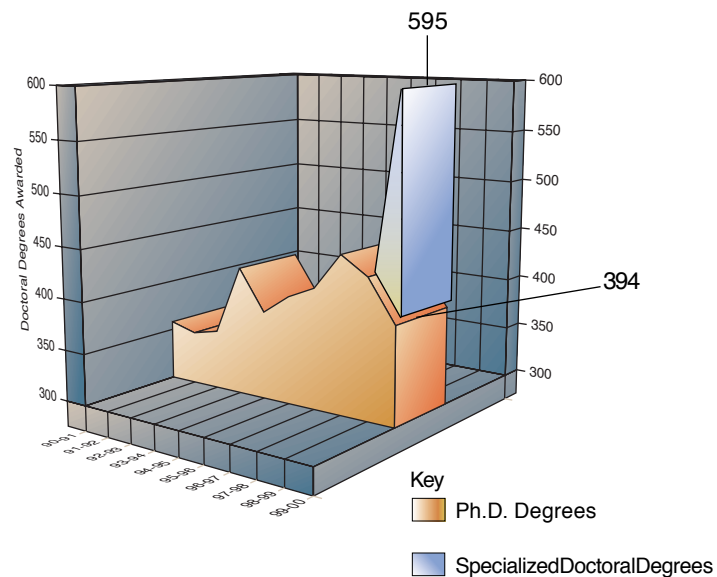
Enrollment of Women Fall 1990-1999

Female graduate student enrollment was 3,757 in Fall 1999, an 11 percent increase over the previous year, while male enrollment increased 8.6 percent. The share of women among the overall graduate student population remained at 45 percent for the second consecutive year.



Doctoral Degrees Awarded 1991-2000

The 394 Ph.D. degrees awarded in 1999-2000 represented a slight decrease from the 434 awarded in 1998-99, but this was offset by an increase in specialized doctoral degrees, such as the Doctor of Audiology and the Doctor of Education, which pushed the total doctoral degrees awarded to 595.



Master's Degrees Awarded 1991-2000

The university awarded 2,113 master's degrees in 1999-2000, a 5 percent increase over 1998-99.



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