

USF RESEARCH STRATEGIC PLAN 2017 • 2021

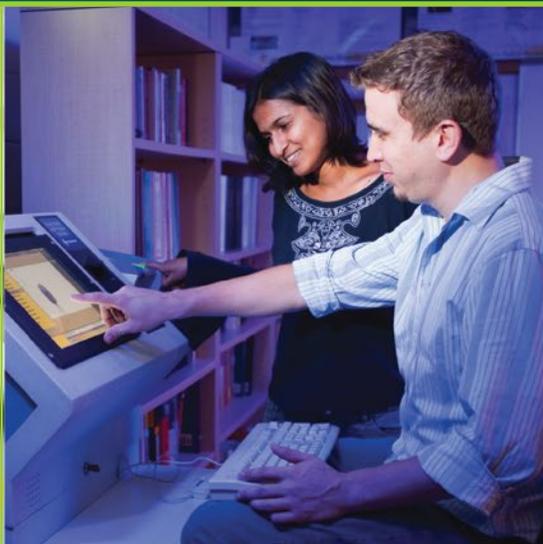


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Photo: USF

A New Mission for USF System Research

Create new knowledge and solutions for global problems, while preparing students to become the next generation of researchers and leaders, able to serve the needs of society

A New Vision for USF System Research

COLLABORATION

Maximize transdisciplinary collaboration around emerging areas of global significance

IMPACT

Maximize translation of research into products and processes that impact communities

VISIBILITY

Perform at the level of a top-tier research and innovation university and be recognized as such

Executive Summary

USF's research journey has been spectacular. USF researchers have conducted groundbreaking fundamental research, translated that research into practice that has made an impact on the world, and trained leaders who are making similar breakthroughs and impact elsewhere.

National Rankings

Now ranked 25th in the nation among public universities for research expenditures by the National Science Foundation, and one of only 40 public research universities nationwide designated as both "very high research activity" and "community engaged" by the Carnegie Foundation for the Advancement of Teaching, USF is classified in the top tier of research universities—a distinction attained by just 2.3% of all universities.

Students work alongside internationally renowned faculty and researchers. USF's faculty hold hundreds of national and international fellowships, honors and awards recognized by the Association of American Universities (AAU), Top American Research Universities (TARU), National Research Council (NRC) and other prestigious national and international awards in different disciplines. USF ranked 4th worldwide for organizations with the most Fellows elected this year by the American Association for the Advancement of Science (AAAS), an AAU recognized award.

USF is dedicated to utilizing its powerful research output to benefit society and create economic prosperity, turning discoveries into patents, products and companies. A global patent leader, USF ranked 10th nationally and 13th internationally among universities for U.S. patents granted in 2014 (NAI/IPO), ranking among the top 15 universities worldwide for five years.

A major driver of economic development in the Tampa Bay region, USF was named an *Innovation & Economic Prosperity University* by the Association of Public and Land-grant Universities in 2015, one of only 48 in the nation. With a record \$440.6M in research funding in 2015, USF's research alone supported an estimated 5,900 jobs and generated \$973.7M in local economic growth, according to economic impact estimates by the National Institutes of Health.



Photo: USF

Five Year Strategic Plan

This five year plan is the result of a charge from the USF System President and Senior Vice President for Research, Innovation & Economic Development to develop an aspirational vision for research and innovation across the USF System that is aligned with the overall USF System goals and accompanied by well-defined areas of distinction. It is meant to be a road map and to guide future investments by leadership across the USF System—chairs, deans, senior vice presidents, chancellors, other senior leadership and the president. Perhaps the most important investment will be hiring and retaining outstanding faculty and enabling them to perform at the next level in obtaining grants, conducting cutting-edge research, teaching and mentoring students and earning prestigious awards and recognition.

The plan is the result of a year-long, iterative, inclusive process involving input from more than 550 stakeholders from across the USF System and Tampa Bay community, which included USF leadership, faculty, staff and external community leaders and constituents.

The Research Strategic Planning Committee was composed of 51 members representing high-impact research areas throughout the USF System.

A detailed report on the strategic planning process is available on the USF Research & Innovation website.

The institutions, colleges and units comprising the USF System have individual strategic plans. This USF System Research Strategic Plan—with its wide-ranging examination of research activities and opportunities spanning the entire university system—is not a summary of other plans.

Instead, it presents a broad vision reflecting **key areas** where USF is already making a difference and where USF can have a greater, more far-reaching impact, enhance our national and international reputation and rankings, educate and empower our students and help create a happy and prosperous future for humanity.

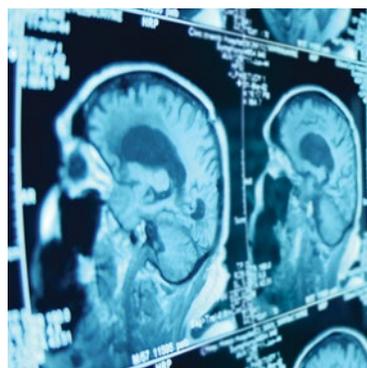


Six Focus Areas

As a robust system, USF has numerous areas of research excellence (see Strengths and Opportunities Analysis for a more comprehensive list of key research strengths, Appendix, p.39). With disciplined and focused investments, USF can continue on a sustained upward trajectory in the following **Six Focus Areas** (see details on the Six Focus Areas in the Appendix, pp.21-27).

- 1 Brain and Spinal Cord**, including neuroscience, neuromorphic computing, cognitive sciences, aging, hearing loss, Alzheimer's, Parkinson's and other neurodegenerative diseases, prostheses, and spinal cord and traumatic brain injury prevention and mitigation.
- 2 Data Science**, including data analytics, financial data analysis, pattern recognition in big data, digital visualization, electronic health records, health informatics and digital humanities.
- 3 Heart**, spanning basic, translational and clinical research, and cardiovascular disease-related care, with emphasis on biological systems research that would be applicable across areas that contribute to cardiovascular disease.
- 4 Human Security**, spanning cybersecurity, global security, military research, food security, spread and control of infectious diseases, promoting civil societies and social networks.
- 5 Research Translation** of intellectual property into products, industry collaborations, software services, startups, processes, and policies that improve the human condition, including supporting economic development and job creation.
- 6 Water**, spanning marine science, purification, supply and management, ocean ecology, coastal ecosystems, fisheries, natural hazards and sustainability.

The Six Focus Areas are aligned with national priorities and initiatives and are broadly defined. Opportunities exist for participation of most, if not all, colleges, departments, centers and institutes in these areas. Participation of multiple and disparate disciplines will enable USF to be distinctive and impactful.



Focus Area #1: Brain and Spinal Cord



Focus Area #2: Data Science



Focus Area #3: Heart

Transdisciplinary Research

In this century, scholars are moving into a world of “transdisciplinary” research.

“Transdisciplinary” describes research that transcends a more traditional **single discipline** focus and moves beyond an **interdisciplinary** focus, where disciplines work together on a project, each using its own knowledge, tools and skills.

Transdisciplinary research creates something completely new, unexpected and “out of the box,” and happens when researchers reach **across, beyond** and **through** other disciplines that may seem unconnected or are not obvious collaborators.

This new approach will allow our best minds to work together and create the new and innovative knowledge, tools and skills needed to solve society’s increasingly complex problems.



Source: *Inventors Digest* | Photo: Jim Lemmon

A Transdisciplinary Researcher:

Merry Lynn Morris, assistant director and faculty, Dance Program, USF College of The Arts.

Determined to find a way to help her father, whose head-on collision left him wheelchair-bound for more than two decades, Morris brought her dancer’s perspective to the project of creating an omni-directional wheelchair that gives users the freedom to move independently and hands-free, even to dance in the chair.

Morris approached the College of Engineering for help in creating a prototype, which continues to be refined with industry partners Quantum Mobility and National Seating and Mobility.



Focus Area #4: Human Security



Focus Area #5: Research Translation



Focus Area #6: Water

Strengths, Opportunities, Aspirations & Results/Metrics

The USF System Research Strategic Planning Committee (listed in the Appendix, p.44) identified USF’s research strengths, opportunities, aspirations, and results/metrics.

<h2 style="text-align: center;">Strengths</h2> <ul style="list-style-type: none"> • 57 research topics of excellence • 25 research centers or institutes • Unique regional assets • Economic driver • Entrepreneurial culture • Benchmarked against AAU 	<h2 style="text-align: center;">Opportunities</h2> <ul style="list-style-type: none"> • 16 areas of opportunities related to the themes of healthy people, communities, and environment • Six Focus Areas identified: <ul style="list-style-type: none"> ▪ Brain and Spinal Cord ▪ Data Science ▪ Heart ▪ Human Security ▪ Research Translation ▪ Water
<h2 style="text-align: center;">Aspirations</h2> <ul style="list-style-type: none"> • High impact research • Focus of entrepreneurial activities • Leader for innovative problem-solving • Exponential growth on campuses by fostering connectivity and collaboration • Increase visibility of research 	<h2 style="text-align: center;">Results/Metrics</h2> <ul style="list-style-type: none"> • Florida Preeminence metrics • Research rankings by NSF and NIH • Technology transfer metrics • Resource metrics • Quality metrics • Recognition metrics • Qualitative metrics

USF System Research Goals

To reach its aspirations, USF will focus on issues where society urgently needs innovation and change, collaborate across disciplines and build on strengths to get there. Toward this end, the following four goals have been set to align with USF's strategic goals:

- 1 Rankings:** Increase USF rankings among public research universities
- 2 Visibility:** Increase national and international reputation for research and innovation activities
- 3 Collaboration:** Foster a transdisciplinary research culture and productivity, building on strengths, with special emphasis in the Six Focus Areas (see details on the Six Focus Areas in the Appendix, pp.21-27)
- 4 Impact:** Increase the application and economic and social impact of USF research



U.S. Rep. Kathy Castor visited USF to highlight USF's role as an economic engine. With her (from left) are senior vice president Dr. Paul R. Sanberg, associate professor Dr. Daniel Yeh, President Judy Genshaft, Castor, and postdoctoral researcher Dr. Ismet Handzic.

GOAL #1 | RANKINGS

Research Goal 1: *Increase USF rankings among public research universities*

Aligned with USF System Strategic Plan 2013-2018:

USF System Goal 1: Well-educated and highly skilled global citizens through our continuing commitment to student success

USF System Goal 2: High-impact research and innovation to change lives, improve health, and foster sustainable development and positive societal change

1 Strategy—Develop research infrastructure

- Tactic—Create new thematic transdisciplinary research center. (USFRI, Academic Affairs, USF Health)
- Tactic—Create a single, central, electronic dashboard for faculty expertise. (Academic Affairs, USF Health, USFRI)
- Tactic—Restructure existing centers and institutes around areas of strategic interest. (Academic Affairs, USF Health)
- Tactic—Inventory and enhance core facilities. (USFRI, Academic Affairs, USF Health)
- Tactic—Foster basic and clinical collaborations. (USF Health)

2 Strategy—Seed fund research that transcends traditional discipline-focused boundaries of traditional research that is focused in a single discipline and changes it thoroughly by reaching across, beyond and through one discipline, and beyond research between two complementary disciplines (interdisciplinary), to create something new (transdisciplinary)

- Tactic—Sponsor a large research initiative targeting specific research areas. (Academic Affairs, USF Health, USFRI)
- Tactic—Institute a peer-reviewed seed grant for transdisciplinary research. (USFRI)
- Tactic—Seed fund the development of common research resources. (USFRI, Academic Affairs, USF Health)

3 Strategy—Increase research capacity

- Tactic—Create a process to retain productive faculty and staff. (Academic Affairs, USF Health)
- Tactic—Make individual and cluster hires that expand current research strengths. (Academic Affairs, USF Health)
- Tactic—Hire high-quality support staff to keep up with faculty hires. (Academic Affairs, USF Health, USFRI)
- Tactic—Increase the quality and number of doctoral students and postdoctoral appointees. (Academic Affairs, USF Health)
- Tactic—Provide merit-based faculty release time for research. (Academic Affairs, USF Health)
- Tactic—Increase number of faculty doing research. (Academic Affairs, USF Health)

GOAL #1 • RANKINGS – METRICS

METRICS	CROSS REFERENCE TO USF METRICS	CURRENT	GOALS				
		FY16	FY17	FY18	FY19	FY20	FY21
Total R&D Expenditures (NSF) (\$M)*	KP - 22	\$494	\$495	\$510	\$525	\$541	\$557
Science & Engineering Research Expenditures (NSF) (\$M)	PE - 6	\$420	\$421	\$427	\$434	\$440	\$440
Non-medical Science & Engineering Research Expenditure (NSF) (\$M)	PE - 7	\$229	\$230	\$233	\$237	\$241	\$244
National Institutes of Health (NIH) Blue Ridge Ranking	New metric	48	48	45	42	40	≤40
National Ranking in STEM Research Expenditures (NSF) (Top 100 ranking in 8 disciplines)	PE - 8	7 (est)	8	8	8	8	8
Number of Postdoctoral Appointees (NSF-NIH)	PE - 11, PBF-10, AAU II-3	298	282	290	297	304	310
Research Doctorates Awarded (IPEDS)	AAU II-2 Carnegie - 5-8	321	320	325	330	335	340

Numbers are reported with a one year lag, e.g., FY16 numbers reflect FY15 actuals.

*Marked metrics are for USF System; others are computed for USF Tampa, as required by Preeminence metrics.

AAU: Association of American Universities

Carnegie: Carnegie Classification of Institutions of Higher Education

IPEDS: Integrated Postsecondary Education Data System

KP: Key Performance Metric

NIH: National Institutes of Health

NSF: National Science Foundation

PBF: Performance-based Funding Metric

PE: State of Florida Preeminence Metric



Photo: Nico Binnio/THINKSTOCK

GOAL #2 | VISIBILITY

Research Goal 2: *Increase national and international reputation for research and innovation activities*

Aligned with USF System Strategic Plan 2013-2018:

USF System Goal 4: Sound financial management to establish a strong and sustainable economic base in support of USF's continued academic advancement

- Expand USF's international identity through design and implementation of a comprehensive, powerful branding campaign

1 Strategy—Increase visibility of USF System research

- Tactic—Define the research and innovation brand. (USFRI, UCM)
- Tactic—Enhance communication of research to the public. (UCM, Academic Affairs, USF Health, USFRI)
- Tactic—Apply transdisciplinary approaches to communications and marketing. (UCM, Academic Affairs, USF Health, USFRI)
- Tactic—Develop an easy-to-browse webpage proclaiming USF's achievements. (UCM)

2 Strategy—Increase opportunities for connection with external peers

- Tactic—Encourage hosting of national and international conferences and workshops. (Academic Affairs, USF Health, USFRI)
- Tactic—Cultivate strategic relationships with elected representatives, media, thought leaders and alumni. (UCM, Government Relations, Alumni Affairs, Advancement, USF Health, USFRI)
- Tactic—Engage and take external leadership roles in peer groups. (Academic Affairs, USF Health, USFRI)

3 Strategy—Help faculty gain internal and external honors and recognition

- Tactic—Develop Citations and Innovation Honors metrics. (Academic Affairs, USFRI)
- Tactic—Expand the external faculty honors and awards program. (USFRI)
- Tactic—Recruit National Academy members. (USFRI, Academic Affairs, USF Health)
- Tactic—Create opportunities for engagement with National Academy members. (USFRI, Academic Affairs, USF Health)
- Tactic—Create a program to coach faculty on how to talk with the press effectively. (UCM, Academic Affairs, USF Health)
- Tactic—Integrate scientific and creative processes within disciplines to increase the translational participation of fine arts and humanities. (Academic Affairs)

GOAL #2 • VISIBILITY – METRICS

METRICS	CROSS REFERENCE TO USF METRICS	CURRENT	GOALS				
		FY16	FY17	FY18	FY19	FY20	FY21
Citations*	AAU I-4	Source pending					
Number of Highly Prestigious external Honors and Awards* (internal)	New metric	91	93	95	97	99	101
Innovation Honors* (internal)	New metric	To be developed					
National Academy Membership (TARU)	PE - 5, AAU I-2	9	10	10	11	11	12

Numbers are reported with a one year lag, e.g., 2016 numbers reflect 2015 actuals.

*Marked metrics are for USF System; others are computed for USF Tampa, as required by Preeminence metrics.

AAU: Association of American Universities

PE: State of Florida Preeminence Metric

TARU: Top American Research Universities



Photo: USF

GOAL #3 | COLLABORATION

Research Goal 3: *Foster a transdisciplinary research culture and productivity, building on strengths, with special emphasis in the Six Focus Areas*

Aligned with USF System Strategic Plan 2013-2018:

USF System Goal 1: Well-educated and highly skilled global citizens through our continuing commitment to student success

USF System Goal 2: High-impact research and innovation to change lives, improve health, and foster sustainable development and positive societal change

USF System Goal 4: Sound financial management to establish a strong and sustainable economic base in support of USF's continued academic advancement

1 Strategy—Increase incentives and decrease barriers for collaborations

- Tactic—Recognize transdisciplinary research at department and college levels for faculty advancement. (Academic Affairs, USF Health)
- Tactic—Develop novel reward structures to incentivize collaborations. (Academic Affairs, USF Health)
- Tactic—Reward college leaders who work together on cross-college collaborative initiatives. (Academic Affairs, USF Health)
- Tactic—Recognize and count joint proposals, papers and grants. (USFRI, Academic Affairs, USF Health)
- Tactic—Develop Grant Application and Institutional Investment metrics. (USFRI)
- Tactic—Establish procedures to address barriers to collaboration. (Academic Affairs, USF Health)
- Tactic—Provide opportunities for collaborative teaching and research. (Academic Affairs, USF Health)
- Tactic—Allow flexible course requirements for students. (Academic Affairs)
- Tactic—Improve Ph.D. program recruitment and training support. (Academic Affairs, USF Health)

2 Strategy—Increase collaborative research within the university system

- Tactic—Facilitate team building. (USFRI)
- Tactic—Encourage social events for presentations and interactions. (USFRI, Academic Affairs, USF Health)
- Tactic—Encourage joint appointments across departments and schools. (Academic Affairs, USF Health)
- Tactic—Share research success stories. (UCM)
- Tactic—Have physical collaborative meeting spaces on campus. (Academic Affairs, USF Health)

3 Strategy–Build and scale-up research support at USFSP and USFSM

- Tactic–Provide release time for research. (Regional Chancellors)
- Tactic–Increase travel support for faculty and students. (Regional Chancellors)
- Tactic–Build post-award support. (USFRI, Regional Chancellors)
- Tactic–Increase access to graduate students and postdoctoral appointees. (Regional Chancellors)
- Tactic–Shift funding priorities toward sustaining research. (Regional Chancellors)

GOAL #3 • COLLABORATION – METRICS

METRICS	CROSS REFERENCE TO USF METRICS	CURRENT	GOALS				
		FY16	FY17	FY18	FY19	FY20	FY21
Number of grant applications from PI/Co-PIs from different colleges* (internal)	New metric	To be developed					
Institutional Investment in transdisciplinary initiatives* (internal)	New metric	To be developed					
Effective Facilities & Administrative (F&A) rate*	New metric	18.3%	19.0%	20.0%	21.0%	22.0%	23.0%

*Marked metrics are for USF System

Facilities and Administrative (F&A) Rate

This is an important metric that measures the sustainability of the research enterprise. F&A charges in a grant recover part of the cost of conducting research at an institution. Not all grants and contracts allow full F&A rate. This results in a lower overall effective F&A rate. If this effective rate is low, then as an institution we do not have enough funds to support research or invest in future collaborative research and researchers.

The F&A Rate for USF is a federally negotiated reimbursement rate provided for externally sponsored projects to help support the university’s indirect costs for conducting research. While most direct costs are covered by external grants, the F&A rate helps the university provide vital infrastructure and support services, such as facilities costs (operating, utilities, communications, etc.), library materials, clerical/administrative personnel, general purpose equipment (computers, calculators, furniture, file cabinets, fax machines) and support of central research units, among other services and supplies.

The **F&A recovery** is based on the dollars invoiced and collected from the sponsor. A portion of the recovered F&A is distributed to the colleges. Each college has the ability to determine the allocation of funds to the department/Principal Investigator (PI). For a more thorough explanation of F&A, please view the “Understanding F&A” document prepared by TRAIN® (The Research Administration Improvement Network) at USF.

USF is in the negotiation year with our cognizant agency, regarding our F&A rate agreement. Projections are based on retaining current rates.

GOAL #4 | IMPACT

Research Goal 4: *Increase the application and economic and social impact of USF research*

Aligned with USF System Strategic Plan 2013-2018:

USF System Goal 2: High-impact research and innovation to change lives, improve health, and foster sustainable development and positive societal change

USF System Goal 3: A highly effective, major economic engine, creating new partnerships to build a strong and sustainable future for Florida in the global economy

USF System Goal 4: Sound financial management to establish a strong and sustainable economic base in support of USF's continued academic advancement

1 Strategy—Cultivate a start-up culture

- Tactic—Build on the National Science Foundation (NSF) Innovation Corps, or I-Corps, program at USF to train faculty and students. (USFRI, Academic Affairs, USF Health)
- Tactic—Build small business funding opportunities. (USFRI)
- Tactic—Institute an early stage fund, supported through private donations. (Advancement, USFRI)
- Tactic—Initiate a USF fundraising campaign to support seed capital and follow-on venture investment. (Advancement, USFRI)

2 Strategy—Foster university-industry collaborations

- Tactic—Increase the pipeline from translational research to products. (USFRI, Academic Affairs, USF Health)
- Tactic—Continue building on the incubation support. (USFRI, Academic Affairs, USF Health)
- Tactic—Expand and network existing executive-in-residence programs. (USFRI, Academic Affairs, USF Health)
- Tactic—Develop Industry-Funded Grants & Contracts metric. (USFRI)

3 Strategy—Build strategic research partnerships among local organizations

- Tactic—Expand effective agreements with more local/regional partners. (USFRI, USF Health)
- Tactic—Build connection with the transplant program at Tampa General Hospital. (USF Health)
- Tactic—Engage actively with regional organizations including economic development agencies such as Tampa Bay Partnership and local and regional EDCs, hospitals, military, veterans, governmental agencies, etc. (USFRI, Academic Affairs, USF Health)

4 Strategy–Enhance community-engaged research and economic development

- Tactic–Connect with unique population groups from the region. (Academic Affairs, USF Health)
- Tactic–Increase business development and incubation. (Academic Affairs, USF Health, USFRI)
- Tactic–Create a dynamic live/work/play environment. (USFRI, USF Research Foundation)
- Tactic–Work with community partners to enhance the area surrounding the university and downtown. (USFRI, USF Research Foundation, Academic Affairs, USF Health)

GOAL #4 • IMPACT – METRICS

METRICS	CROSS REFERENCE TO USF METRICS	CURRENT	GOALS					
		FY16	FY17	FY18	FY19	FY20	FY21	
Patents Awarded (over 3 yr period)* (USPTO)	PE - 9	291	273	276	279	282	285	
Number of Licenses and Options Executed* (AUTM)	KP - 25	120	121	122	123	124	125	
Number of Startups* (AUTM)	KP - 26	8	9	10	11	12	14	
Number of industry-funded grants and contracts, local regional, international* (internal)	New Metric	To be developed						

*Marked metrics are for USF System, others are computed for USF Tampa, as required by Preeminence metrics.

KP: Key Performance Metric

PE: State of Florida Preeminence Metric

AUTM: Association of University Technology Managers

USPTO: U.S. Patent and Trademark Office



Photo: monshy/THINKSTOCK

Accomplishing the Plan

Executing this five-year plan will involve the entire USF System in Tampa, St. Petersburg and Sarasota-Manatee. Success will stem from the activities of USF Research & Innovation (the university's central research administration unit), Academic Affairs and the Colleges, USF Health, the university's Centers and Institutes, and the entire body of research faculty, students and staff.

USF Research & Innovation (USFRI) and the Senior Vice President for Research, Innovation & Economic Development (SVPR) are responsible for monitoring the progress of the ideas presented in this plan. The SVPR will provide the President with progress reports on a regular basis.

A publicly available research dashboard will display progress for key metrics.

Progress on the strategic ideas in this report will require the joint effort of all research stakeholders, including associate deans for research (ADRs), members of the Research Advisory Committee (RAC), the Faculty Senate Research Council (RC), Sponsored Research (SR), the Technology Transfer Office/Patents & Licensing (TTO/P&L), etc. All have either a direct reporting relationship to the SVPR (SR and TTO/P&L) or work with the SVPR in a collaborative or advisory capacity (ADRs, RC, and RAC).

The different committees and units within USFRI will be responsible for monitoring aspects of the plan that fall within their purview. The ADRs will be responsible for parts of the plan that intersect with their colleges, engage in transdisciplinary issues and projects guided by this report and will work with the Deans on matters that intersect with academic issues such as tenure, promotion, recognition and hiring. The RAC should use this document to guide future investments of the strategic investment pool. The RC should use this document to guide investments of the internal grants program. USFRI units, such as SR and TTO/P&L, should use this document to guide progress on the measures and strategies that relate to their responsibilities.

Like the process to determine the Six Focus Areas and the goals set forth in this plan, research activities over the next five years must be undertaken as an entire System.

Accomplishing these goals will take a sustained institutional commitment, an investment of resources and the passion of our faculty, students and staff.

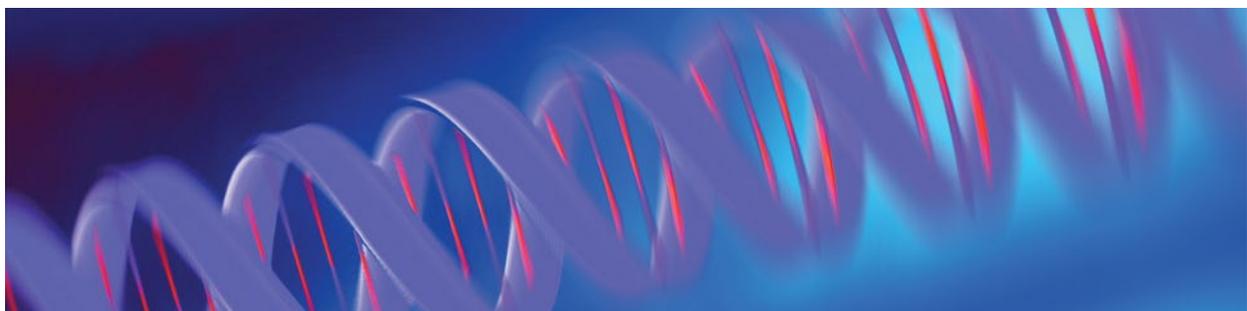
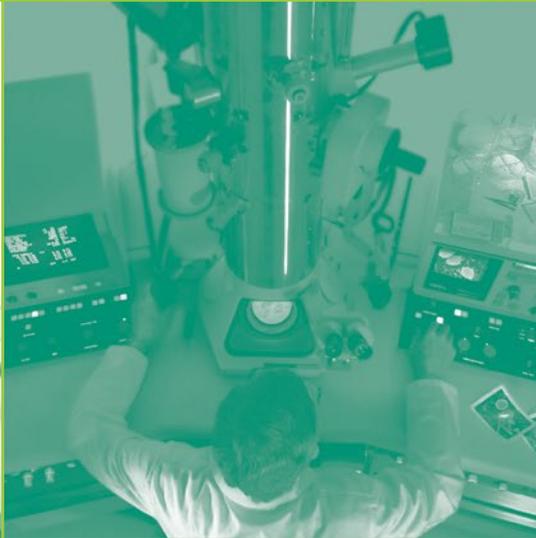


Photo: THINKSTOCK



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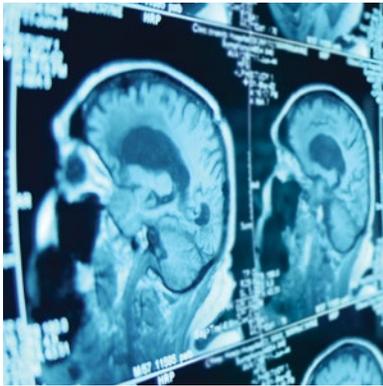
A P P E N D I X



SIX FOCUS AREAS

USF is well positioned to achieve international eminence in the Six Focus Areas outlined on the following pages, which are also most likely to further USF's long-term strategic goals.

Focused investment of resources in these areas is recommended. The Six Focus Areas, which were determined by the 51-member, system-wide Research Strategic Planning Committee, are presented in alphabetical order.



Focus Area #1
Brain and Spinal Cord



Focus Area #2
Data Science



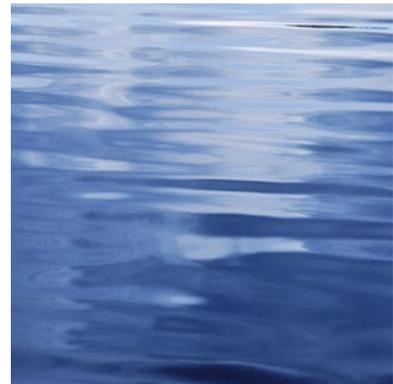
Focus Area #3
Heart



Focus Area #4
Human Security



Focus Area #5
Research Translation



Focus Area #6
Water

FOCUS AREA #1 | BRAIN AND SPINAL CORD

This area includes: neuroscience, neuromorphic computing, cognitive sciences, aging, hearing loss, Alzheimer's, Parkinson's and other neurodegenerative diseases, prostheses and spinal cord and traumatic brain injury prevention and mitigation.

USF has a history of strength in this domain, with many experts and research groups that cut across health-related disciplines.

In addition, bringing in cognitive psychology, computing, bio-ethics, and engineering experts would enable broad-based, transdisciplinary research on this important problem.

This focus aligns well with the national [BRAIN initiative](#), a multi-agency effort for brain research through advancing innovative neuro-technologies that “will help reveal the underlying pathology in a vast array of brain disorders and provide new therapeutic avenues to treat, cure, and prevent neurological and psychiatric conditions, such as Alzheimer’s disease, autism, schizophrenia, depression, epilepsy, and addiction” ([National Institutes of Health \(NIH\)-wide Strategic Plan](#)).

Furthermore, the ability to bring together engineering and computer science expertise working together with neuroscientists is in direct alignment with a better understanding and modeling of the brain and with [National Science Foundation \(NSF\) support of brain research](#).

Reverse engineering the brain is also a National Academy of Engineering (NAE) [Grand Challenge](#) problem.

Investment will be needed to broaden the expertise in brain imaging, brain mapping, neuromorphic computing, and medical engineering solutions for the brain.

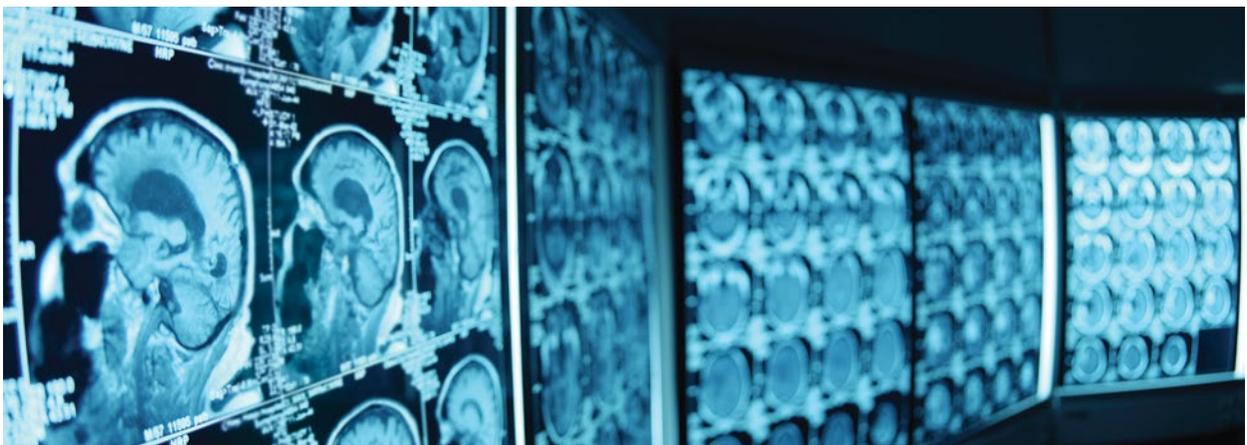


Photo: THINKSTOCK

FOCUS AREA #2 | DATA SCIENCE

The USF System has disciplinary strengths in this area, including: data analytics, financial data analysis, pattern recognition in big data, digital visualization, electronic health records, health informatics and digital humanities.

Big Data Science is already transforming a multitude of such fields as health diagnosis, energy, sustainable health, environment (including marine) and cybersecurity. Use of cognitive technologies for big data can have a major impact on getting knowledge into practice faster, including within the Six Focus Areas.

The USF Health Informatics Institute, the data and technology coordinating hub for nearly every major Type 1 diabetes clinical trial worldwide, is the epicenter for global juvenile diabetes research.

In addition to science and engineering, there is increased emphasis on digital tools and technologies in the humanities by the [National Endowment for the Humanities \(NEH\)](#) (digital humanities).

USF is applying advanced visualization technologies to address such problems in the humanities as the worldwide preservation of cultural heritage.

Immediate and significant investments will be needed to bring this area to competitive levels.



Photo: THINKSTOCK

FOCUS AREA #3 | HEART

This area includes: basic, translational and clinical research and cardiovascular disease-related care.

Understanding the root causes of cardiovascular disease and translating knowledge into novel therapeutics and diagnostics is critical.

Unlike traditional academic departments, or single-disease focused units, emphasis should be on biological systems research that would be applicable across the areas that contribute to cardiovascular disease, such as integrated cell and organ physiology; pharmacology, nanotechnology and drug discovery; cardiac regeneration and surgery; molecular biology, genomics, and personalized medicine; and bioinformatics.

The new USF Heart Institute in downtown Tampa will conduct basic, translational and clinical research and will provide cardiovascular disease-related care. The Institute's research activities will address the root causes of cardiovascular disease and will translate knowledge into novel therapeutics and diagnostics to improve treatment and quality of life.

Strong integration of engineering in efforts in this focus area will also allow USF to leverage [next generation medical engineering](#) and synthetic biology solutions.

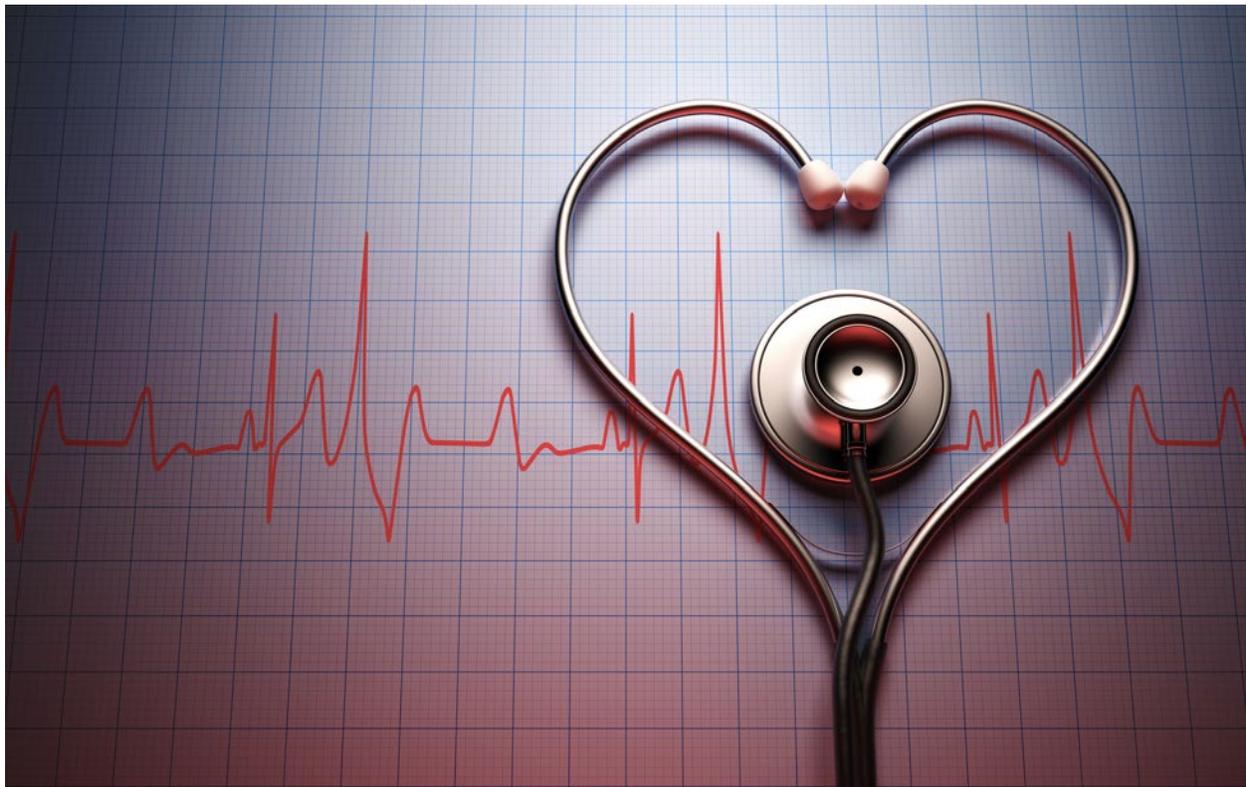


Photo: KTS Image/THINKSTOCK

FOCUS AREA #4 | HUMAN SECURITY

This area includes: cybersecurity, global security, military research, food security, spread and control of infectious diseases, promoting civil societies and social networks.

USF has a world-class cohort of researchers across disciplines in infectious diseases with global presence. Our faculty members conduct research, analyze policy, deliver clinical care, and provide specialized training to healthcare providers locally, nationally and internationally. We have deep expertise in mosquito borne infections, such as malaria, and other vector borne diseases. Our aspiration is to be an international resource for infectious disease identification, prevention, treatment and control for the 21st century.

The state of Florida, through the [Florida Center for Cybersecurity](#) at USF, has invested heavily in recruiting top-notch faculty studying the security and privacy of digital systems and cyber-networks. Building military and industrial partnerships are integral to this effort. A half-million dollar statewide seed grant program fosters collaborative research across the state university system, in consultation with Team Orlando, consisting of representatives from Joint Training Integration and Evaluation Center (JTIEC), Naval Air Warfare Center Training Systems Division (NAWCTSD), Space and Naval Warfare Systems Command (SPAWAR), Sandia Labs, Air Force Modeling and Simulation Office (AFAMS), U.S. Marine Corps and Army Research Laboratory.

The USF System has world-recognized scholars in global security policy, social network analysis, and food sustainability and safety. Our work on immigration, citizenship, and ways of promoting civil society is broad-based and beginning to achieve national recognition. We are partnering with leading non-profits to conduct groundbreaking research on food insecurity in our community.



Photo: THINKSTOCK

FOCUS AREA #5 | RESEARCH TRANSLATION

This area is focused on the translation of intellectual property into products, industry collaborations, software services, start-ups, processes, and policies that improve the human condition, including supporting economic development and job creation.

Translation of research to utilization in the public interest involves intellectual property protection, licensing and partnerships for the development of a commercial pipeline, start-up facilitation and incubation, joint industry and university R&D, military partnerships, and community engagement. USF has significant advantages in this space and is already a national-level player.

This focus at USF aligns well with the national emphasis on innovation and entrepreneurship reflected in various reports. The U.S. Department of Commerce's report on [The Competitive and Innovative Capacity of the United States](#) lists as one of its 10 policy proposals the need to "speed the movement of ideas from basic science labs to commercial application."

Nationally, there is increased emphasis on start-ups, as is evidenced by the highly popular and growing Innovation Corps, or I-Corps, programs at NSF, NIH, Department of Defense (DoD) and other federal agencies, the increasing Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR) program and increased emphasis on entrepreneurship by the [National Academy of Engineering](#).

Translational medicine at USF would be transformed by bringing together basic research scientists, therapeutic discovery and clinical and non-clinical researchers. The pipeline is about 15 years and has odds of 10,000:1 for a compound to progress from the lab to the clinic ([NIH Strategic Plan, 2016-2020](#)).

Potential for significant growth exists through partnerships with targeted government entities and local businesses to align basic research funding with applied research opportunities. Ultimately, any dynamic and meaningful partnership must support the university's mission, be aligned with its values, and benefit the USF community in terms of services and products. Partnerships should be consistent with the university's brand, campus services, impact and revenue growth principles.

Relationships with world class businesses and industry lead to real world experiences for students, job creation and economic impact in the state of Florida. Industry research and start-up opportunities exist in computer software. USF has expertise in Software as a Service (SaaS) solutions, especially as it relates to healthcare and medicine. USF is the integral partner in the U.S. Department of Commerce-funded downtown accelerator, Tampa Bay WaVE, which is focused on mobile app-based companies.

FOCUS AREA #6 | WATER

This area includes: marine science, purification, supply and management, ocean ecology, coastal ecosystems, fisheries, natural hazards and sustainability.

Providing access to clean water is a [National Academy of Engineering \(NAE\) Grand Challenge](#) problem. This issue is central to environmental issues and, ultimately, economic issues in Florida, as was shown with the 2010 Deepwater Horizon Gulf of Mexico oil spill.

Additionally, global change and development issues, such as those articulated and funded by the [Gates Foundation](#) and [USAID](#), along with sustainable energy, environment and transportation, figure very strongly among the 14 Grand Challenges outlined by the [National Academy of Engineering](#). Arts, sciences, and health linkages can be leveraged for addressing these global issues of concern.

As changes to our planet's climate and ecosystems are underway, USF research is focused on improving our understanding of the physical, chemical, biological and social processes driving these changes. USF researchers and scholars are actively seeking answers to fundamental questions related to environmental change for a more sustainable world.

Our geography gives USF a distinct advantage and USF has experts in these areas, in multiple colleges, with national presence.

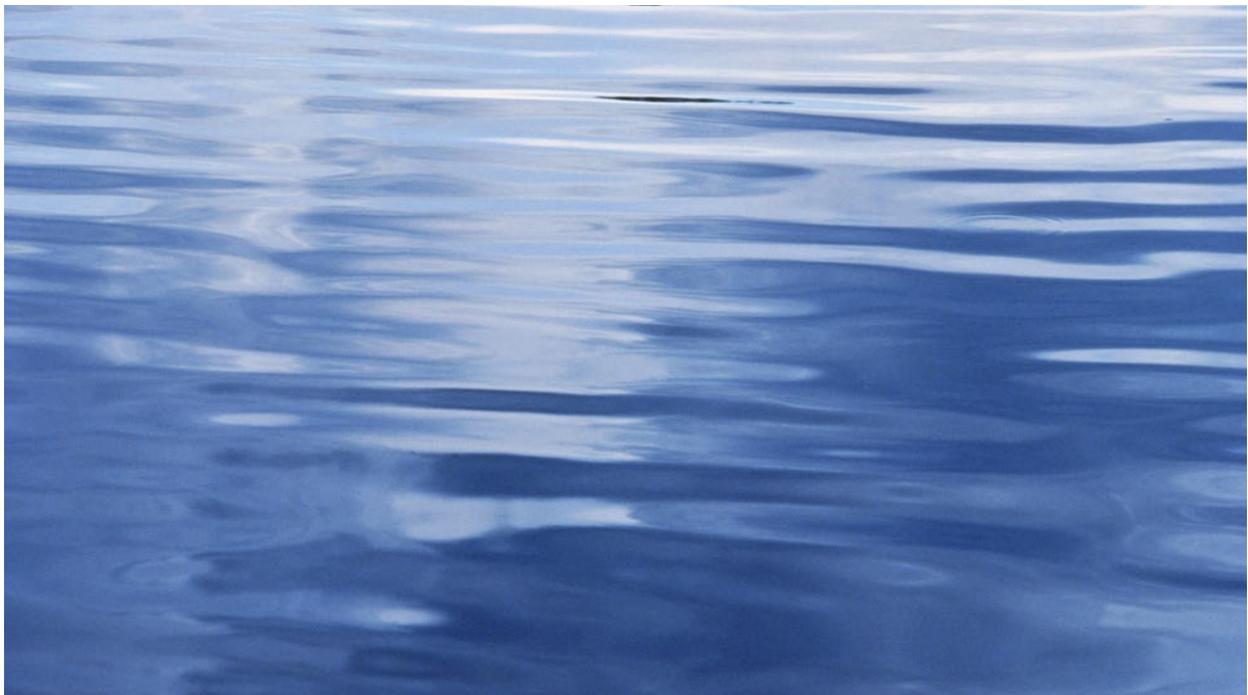
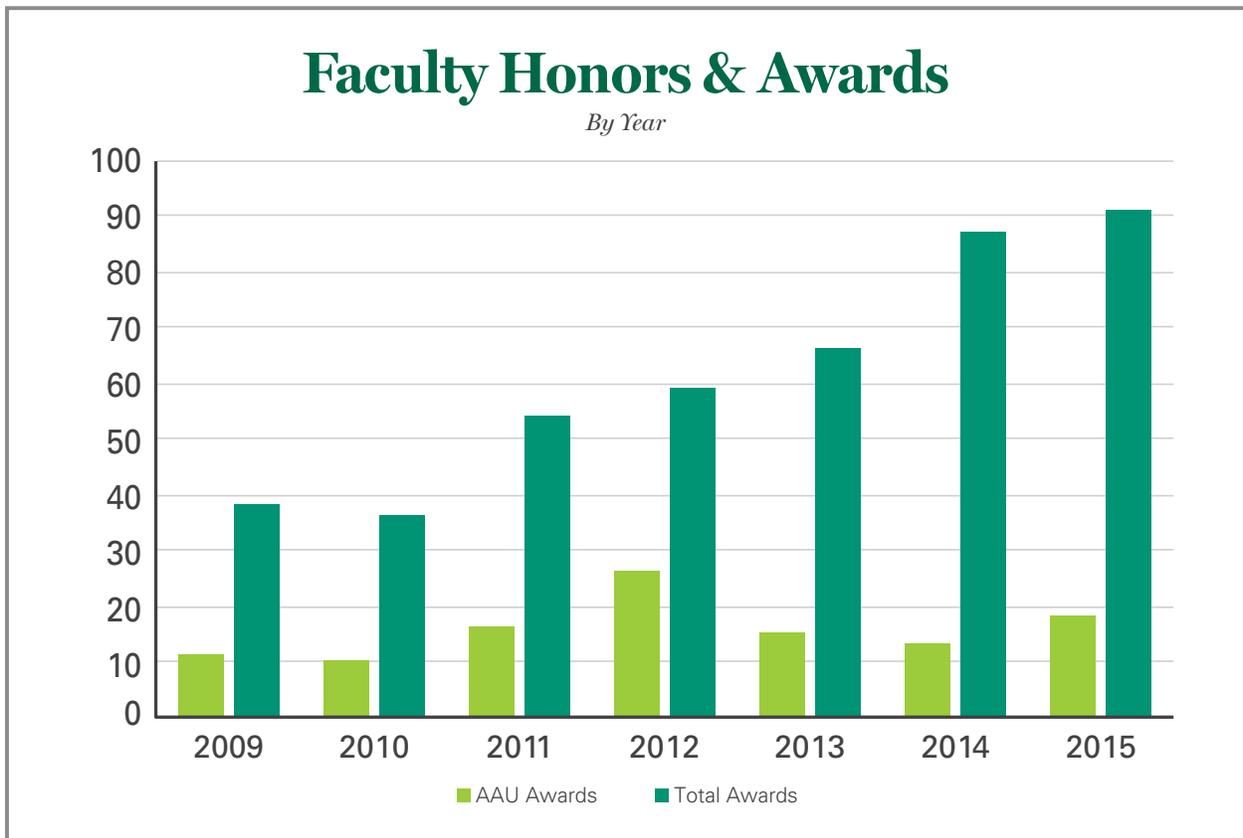
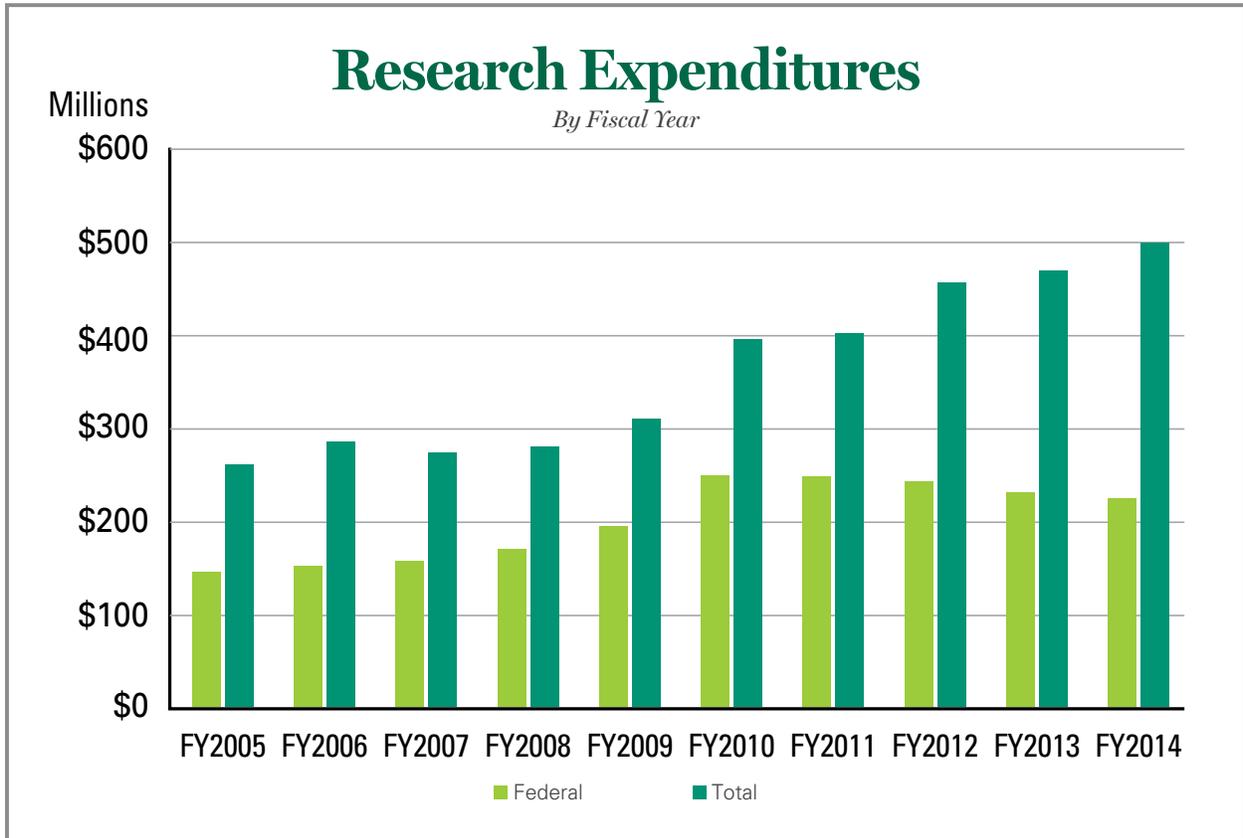
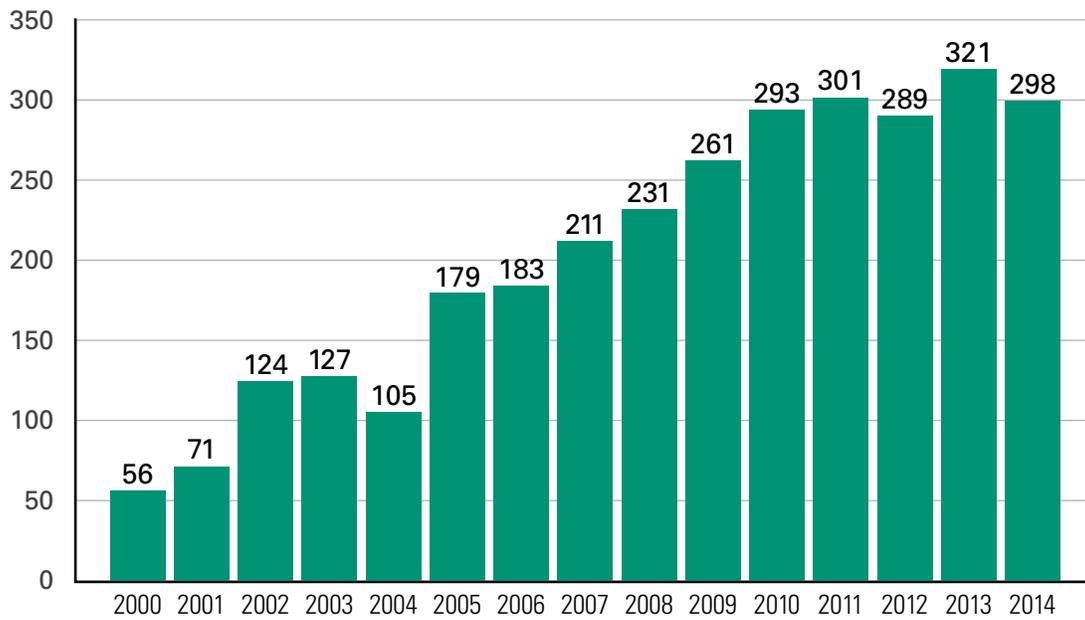


Photo: Proudes/THINKSTOCK

Selected USF Research-Related Performance Metrics

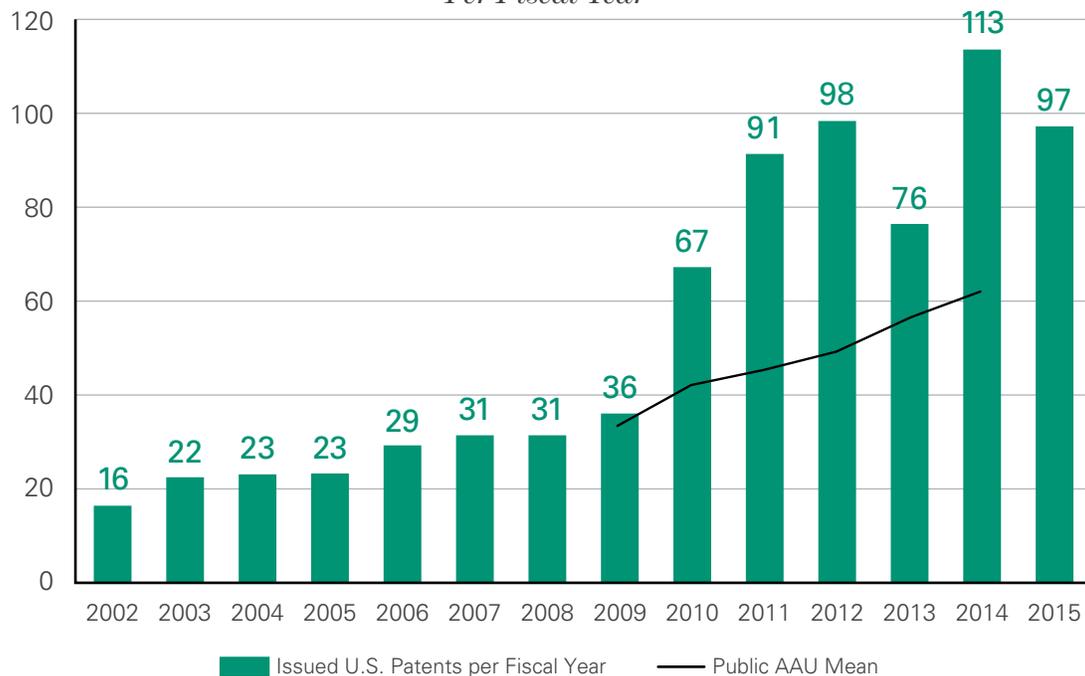


Postdoctoral Appointees



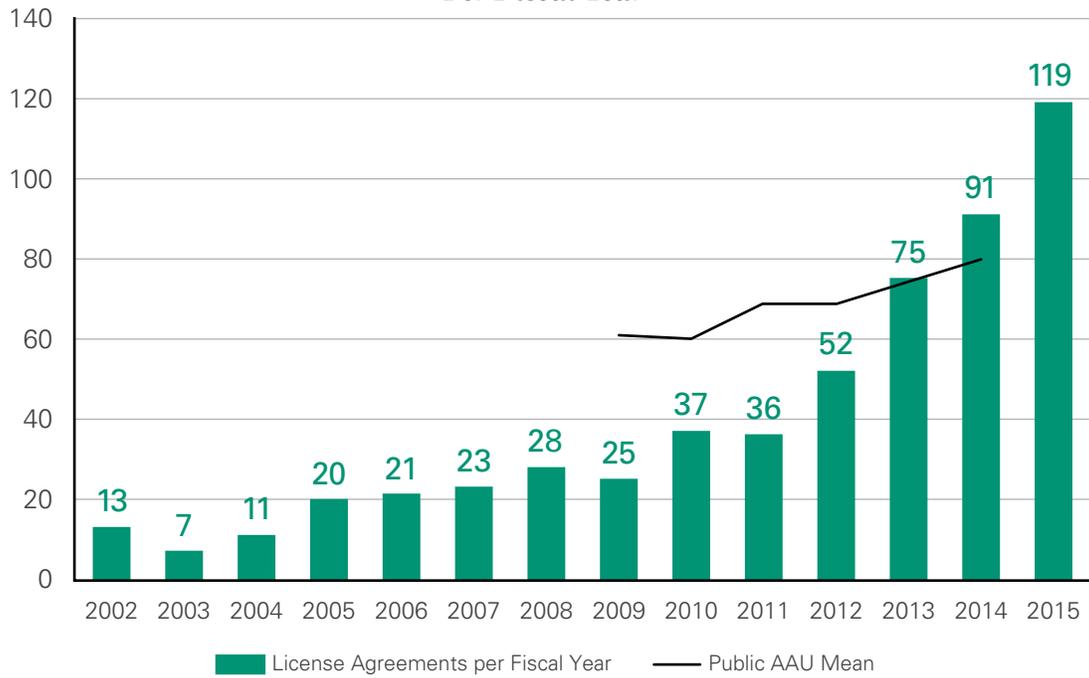
Issued U.S. Patents

Per Fiscal Year



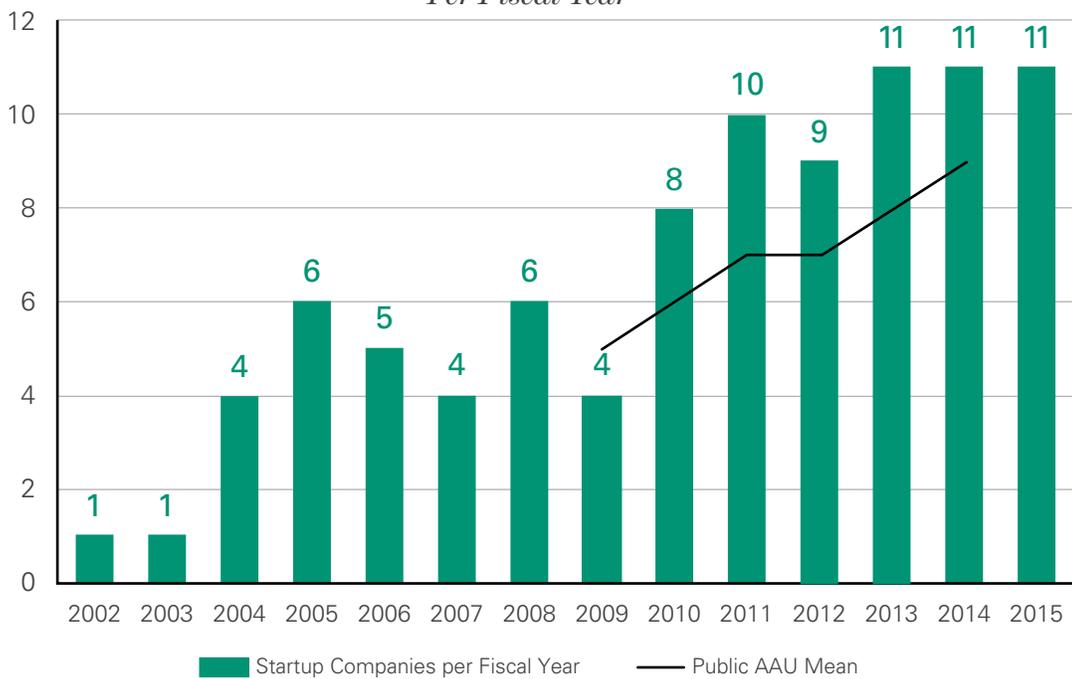
License Agreements

Per Fiscal Year



Start-ups

Per Fiscal Year



Benchmarking Comparisons to Association of American Universities (AAU) Public Institutions

Performance of USF is compared against public AAU institutions in the tables below. (Data accessed at <http://usfweb.usf.edu/ODS/Planning/Performance/default.aspx>)

The following public AAU institutions are included in these comparisons:

- Georgia Institute of Technology–Main Campus
- Indiana University–Bloomington
- Iowa State University
- Michigan State University
- The Ohio State University–Main Campus
- Pennsylvania State University–Main Campus
- Purdue University–Main Campus
- Rutgers University–New Brunswick
- Stony Brook University
- Texas A & M University–College Station
- University at Buffalo
- University of Arizona
- University of California–Berkeley
- University of California–Davis
- University of California–Irvine
- University of California–Los Angeles
- University of California–San Diego
- University of California–Santa Barbara
- University of Colorado Boulder
- University of Florida
- University of Illinois at Urbana-Champaign
- University of Iowa
- University of Kansas
- University of Maryland–College Park
- University of Michigan–Ann Arbor
- University of Minnesota–Twin Cities
- University of Missouri–Columbia
- University of North Carolina at Chapel Hill
- University of Oregon
- University of Pittsburgh–Pittsburgh Campus
- University of Texas at Austin
- University of Virginia–Main Campus
- University of Washington–Seattle Campus
- University of Wisconsin–Madison

NSF AAU Federal Research Expenditures x 1000

Institution	FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013	FY 2013-2014
Public AAU High	\$824,449	\$943,106	\$902,428	\$919,017	\$899,035
Public AAU Mean	\$318,291	\$347,801	\$347,656	\$351,297	\$347,356
USF (Tampa)	\$242,623	\$242,816	\$236,031	\$225,147	\$222,647
Public AAU Low	\$70,881	\$73,920	\$79,587	\$74,750	\$74,405

Note: Comparative data available up to 2013-14 only.

Source: [National Science Foundation / Higher Education Research and Development](#) (NSF-HERD)

Definition: This is NSF Federal Funding minus NSF Agricultural (USDA) Funding.

These data are collected by the National Science Foundation. The AAU Membership Committee implements a correction factor to subtract the estimated proportion of university expenditures drawn from USDA. Figures reported by fiscal year (FY). Dollar amounts are in thousands.

NSF Federal Research & Development (R&D) Expenditures x 1000

Institution	FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013	FY 2013-2014
Public AAU High	\$829,885	\$948,976	\$909,652	\$928,193	\$909,034
Public AAU Mean	\$327,250	\$357,570	\$359,302	\$363,339	\$359,758
USF (Tampa)	\$243,017	\$243,030	\$236,148	\$225,414	\$222,790
Public AAU Low	\$71,208	\$74,143	\$79,727	\$75,423	\$74,603

Note: Comparative data available up to 2013-14 only.

Source: [National Science Foundation / Higher Education Research and Development](#) (NSF-HERD)

Definition: R&D expenditures in all fields, including direct and recovered indirect costs, funded by all agencies of the Federal government. Dollar amounts are in thousands.

From FY 2003 through FY 2009, total R&D expenditures and non-S&E (Science & Engineering) R&D expenditures are lower-bound estimates for the national totals because (i) non-S&E R&D totals were collected only from institutions with S&E R&D, and (ii) NSF did not attempt to estimate for nonresponse on the non-S&E expenditures item.

Prior to 2003, the survey only requested R&D expenditures within science and engineering (S&E) fields, therefore this variable can be used for any trend analyses including 2003 and beyond. For trend analyses involving years prior to 2003, use the analysis variable Federally Financed Higher Education R&D Expenditures for S&E.

NSF Non-Federal R&D Expenditures x 1000

Institution	FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013	FY 2013-2014
Public AAU High	\$484,106	\$518,009	\$589,118	\$567,626	\$607,102
Public AAU Mean	\$235,231	\$244,552	\$249,030	\$265,182	\$287,488
USF (Tampa)	\$142,012	\$151,933	\$207,058	\$233,995	\$265,851
Public AAU Low	\$17,729	\$18,022	\$18,714	\$19,099	\$16,600

Note: Comparative data available up to 2013-14 only.

Source: Derived variable

Definition: This variable represents the non-federally financed R&D expenditures at universities and colleges as reported by the National Science Foundation. The AAU Membership Committee recognizes that these sources of academic research support high-quality research; however, since they are generally not allocated through competitive, merit-review processes, they are considered as Phase II indicators for membership consideration. Non-federal funding sources include associations, foundations, and industry. Dollar amounts are in thousands.

NSF Total R&D Expenditures x 1000

Institution	FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013	FY 2013-2014
Public AAU High	\$1,184,445	\$1,279,123	\$1,322,711	\$1,375,117	\$1,349,262
Public AAU Mean	\$562,481	\$602,123	\$608,331	\$628,521	\$647,246
USF (Tampa)	\$385,029	\$394,963	\$443,206	\$459,409	\$488,641
Public AAU Low	\$94,107	\$103,019	\$105,030	\$94,522	\$91,203

Note: Comparative data available up to 2013-14 only.

Source: [National Science Foundation / Higher Education Research and Development](#) (NSF-HERD)

Definition: This measure reflects research expenditures resulting from all external funding sources (federal, state, local, business, and industry). These data are collected by the National Science Foundation. Figures reported by fiscal year (FY). Note: prior to FY2010, NSF did not include non-science and engineering research expenditures in this metric. Dollar amounts are in thousands.

From FY 2003 through FY 2009, total R&D expenditures and non-S&E R&D expenditures are lower-bound estimates for the national totals because (i) non-S&E R&D totals were collected only from institutions with S&E R&D, and (ii) NSF did not attempt to estimate for nonresponse on the non-S&E expenditures item.

Postdoctoral Appointees

Institution	Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013
Public AAU High	1361	1468	1286	1533	1275
Public AAU Mean	530	590	567	569	561
USF (Tampa)	261	293	301	289	321
Public AAU Low	72	80	67	90	89

Note: Comparative data available up to 2013 only.

Source: [National Science Foundation / National Institutes of Health](#) (NSF-NIH)

Definition: This variable is the number of postdoctoral appointees in GSS-eligible science, engineering, and health (SEH) units in the fall of the data collection year.

Postdoctoral appointees include individuals with SEH degrees (PhD, MD, DDS, or DVM, including foreign degrees equivalent to U.S. doctorates) who devote their primary effort to their own research training through research activities or study in the department under temporary appointments carrying no academic rank. These individuals may contribute to the academic program through seminars, lectures, or working with graduate students. Such postdocs may have different titles at different institutions, e.g., "Postdoctoral Scholar," "Research Associate," "Postdoctoral Fellow," or "Postgraduate Researcher." Excluded are clinical fellows and those with appointments in residency training programs in medical and health professions, unless research training under the supervision of a senior mentor is the primary purpose of the appointment.

Non-Faculty Researchers with Doctorates

Institution	Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013
Public AAU High	676	707	747	603	1128
Public AAU Mean	153	223	237	227	252
USF (Tampa)	164	138	128	126	126
Public AAU Low	12	5	21	5	7

Note: Comparative data available up to 2013 only.

Source: [National Science Foundation / National Institutes of Health](#) (NSF-NIH)

Definition: This variable is the number of non-faculty research staff in GSS-eligible science, engineering, and health (SEH) units in the fall of the data collection year. Non-faculty research staff includes all doctoral scientists and engineers who are involved principally in research activities but are not considered either postdoctoral appointees or members of the regular faculty.

Invention Disclosures Received

Institution	FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013	FY 2013-2014
Public AAU High	409	384	426	412	421
Public AAU Mean	195	212	235	223	233
USF	161	172	177	185	190
Public AAU Low	30	29	27	42	56

Note: The University Systems of California, Texas and New York are excluded, as metrics are not available at the institutional level. Comparative data available up to 2013-14 only.

Source: [Association of University Technology Managers](#) (AUTM)

Definition: The number of invention disclosures received in a given year as reported by the Association of University Technology Managers in the annual Licensing Survey.

License Revenue Received x 1000

Institution	FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013	FY 2013-2014
Public AAU High	\$83,905	\$67,362	\$76,955	\$99,491	\$104,767
Public AAU Mean	\$16,360	\$12,393	\$14,365	\$16,059	\$16,003
USF	\$17,411	\$1,390	\$1,243	\$1,802	\$1,405
Public AAU Low	\$718	\$836	\$921	\$926	\$1,112

Note: The University Systems of California, Texas and New York are excluded, as metrics are not available at the institutional level. Comparative data available up to 2013-14 only.

Source: [Association of University Technology Managers](#) (AUTM)

Definition: This revenue includes several fees, payments and royalties as reported and specified by the Association of University Technology Managers in the annual Licensing Survey. Dollar amounts are in thousands.

Recent task forces have been convened by the AAU and APLU to address the criticism for placing too much emphasize on maximizing revenue of university translational research and not the rapid dissemination of discoveries for the public good. According to the APLU Task Force on Managing University Intellectual Property, "Licensing activity is a good measure, as a starting point, of the university's efforts toward commercialization. Revenue, however, is not as good an indicator. ... A set of non-revenue indicators must be part of IP management policies and practices if we are to ensure public benefit of this work." Prominent universities, such as Yale, have ceased reporting their revenue dollars on a national level. The industry organization leadership (AUTM) is considering the possibility of not publicly providing the metric of licensing revenue in future reports. The Florida Board of Governors has recently removed the metric of licensing revenue from state work plan reporting requirements for public universities.

License/Option Agreements Executed

Institution	FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013	FY 2013-2014
Public AAU High	196	194	209	260	264
USF	37	36	52	75	91
Public AAU Mean	60	69	69	74	80
Public AAU Low	7	9	8	14	29

Note: The University Systems of California, Texas and New York are excluded, as metrics are not available at the institutional level. Comparative data available up to 2013-14 only.

Source: [Association of University Technology Managers](#) (AUTM)

Definition: The number of licenses or option agreements that were executed in the year for all technologies as reported by the Association of University Technology Managers in the annual Licensing Survey.

Start-ups Formed

Institution	FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013	FY 2013-2014
Public AAU High	11	21	15	17	24
USF	8	10	9	11	11
Public AAU Mean	6	7	7	8	9
Public AAU Low	0	0	0	1	0

Note: The University Systems of California, Texas and New York are excluded, as metrics are not available at the institutional level. Comparative data available up to 2013-14 only.

Source: [Association of University Technology Managers](#) (AUTM)

Definition: The number of new companies initiated in a given year as reported by the Association of University Technology Managers in the annual Licensing Survey.

U.S. Patents Issued

Institution	FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013	FY 2013-2014
Public AAU High	133	156	153	157	166
USF	67	91	98	76	113
Public AAU Mean	42	45	49	56	62
Public AAU Low	7	5	7	7	6

Note: The University Systems of California, Texas and New York are excluded, as metrics are not available at the institutional level. Comparative data available up to 2013-14 only.

Source: [Association of University Technology Managers](#) (AUTM)

Definition: The number of U.S. patents issued during the period indicated as reported by the Association of University Technology Managers in the annual Licensing Survey.



USF patent wall.

Photo: USF

Preeminence Research University Criteria (Florida Board of Governors)

2016 UNIVERSITY WORK PLAN



UNIVERSITY OF SOUTH FLORIDA SYSTEM

BOT APPROVED 6/2/2016

PREEMINENT RESEARCH UNIVERSITY FUNDING METRICS

USF-TAMPA CAMPUS ONLY

	BENCH- MARKS	2016 ACTUAL	2017 GOALS	2018 GOALS	2019 GOALS	2020 GOALS
Average GPA and SAT Score <i>for incoming freshman in Fall semester</i>	4.0 GPA 1200 SAT	4.1 1223 <small>Fall 2015</small>	4.0 1220 <small>Fall 2016</small>	4.05 1222 <small>Fall 2017</small>	4.075 1224 <small>Fall 2018</small>	4.10 1226 <small>Fall 2019</small>
Public University National Ranking <i>in more than one national ranking</i>	Top 50	4 <small>2016</small>	5 <small>2017</small>	5 <small>2018</small>	5 <small>2019</small>	5 <small>2020</small>
Freshman Retention Rate <i>Full-time, FTIC</i>	90%	88% <small>2014-15</small>	90% <small>2015-16</small>	91% <small>2016-17</small>	92% <small>2017-18</small>	93% <small>2018-19</small>
6-year Graduation Rate <i>Full-time, FTIC</i>	70%	68% <small>2009-15</small>	66.5% <small>2010-16</small>	70.0% <small>2011-17</small>	72.0% <small>2012-18</small>	74.0% <small>2013-19</small>
National Academy Memberships	6	8 <small>2016</small>	9 <small>2017</small>	10 <small>2018</small>	10 <small>2019</small>	10 <small>2020</small>
Science & Engineering Research Expenditures (\$M)	\$200 M	\$420 <small>2014-15</small>	\$421 <small>2015-16</small>	\$427 <small>2016-17</small>	\$434 <small>2017-18</small>	\$440 <small>2018-19</small>
Non-Medical Science & Engineering Research Expenditures (\$M)	\$150 M	\$229 <small>2014-15</small>	\$230 <small>2015-16</small>	\$233 <small>2016-17</small>	\$237 <small>2017-18</small>	\$241 <small>2018-19</small>
National Ranking in S.T.E.M. Research Expenditures <i>includes public & private institutions</i>	Top 100 <small>in 5 of 8 disciplines</small>	7 <small>2013-14</small>	7 <small>2014-15</small>	8 <small>2015-16</small>	8 <small>2016-17</small>	8 <small>2017-18</small>
Patents Awarded <i>over 3 year period</i>	100	297 <small>2013-15</small>	291 <small>2014-16</small>	273 <small>2015-17</small>	276 <small>2016-18</small>	279 <small>2017-19</small>
Doctoral Degrees Awarded Annually	400	601 <small>2014-15</small>	645 <small>2015-16</small>	650 <small>2016-17</small>	655 <small>2017-18</small>	660 <small>2018-19</small>
Number of Post-Doctoral Appointees	200	289 <small>Fall 2012</small>	321 <small>Fall 2013</small>	298 <small>Fall 2014</small>	277 <small>Fall 2015</small>	285 <small>Fall 2016</small>
Endowment Size (\$M)	\$500 M	\$417 <small>2014-15</small>	\$395 <small>2015-16</small>	\$412 <small>2016-17</small>	\$432 <small>2017-18</small>	\$448 <small>2018-19</small>
NUMBER OF METRICS ABOVE THE BENCHMARK		9	10	11	11	11

Note: Metrics are defined in appendix. For more information about Preeminent state research universities, see 1001.7065 Florida Statutes.

Strengths and Opportunities Analysis

Strengths

The USF System has a significant community of strong scholars, some concentrated in a discipline, and some spread across departments (listed alphabetically):

- Artificial Intelligence
- Assistive Robotics
- Autism
- Biomedical Engineering
- British International Theatre (BRIT) Program in The Arts
- Computer Chip Design
- Climate Change
- Clinical Trials
- Community Cultural Development
- Community Engaged Research
- Computer Vision and Pattern Recognition
- Creative/Arts-Based Research and Practice
- Cybersecurity
- Data Science/Data Analytics
- Diabetes
- Digital Design and Animation
- Drug Discovery
- Entrepreneurship
- Forensic Anthropology
- Geosciences–Volcanoes
- Genomics
- Global Health
- Global Scholars–Fulbright
- Health Disparities/Equity
- HIV/AIDS
- Humanitarian Engineering
- Hyperbaric Biomedical Research
- Infectious Diseases
- Innovative Design Practice
- Machine Learning
- Marine and Coastal Issues
- Materials Science and Engineering
- Maternal and Child Health
- Mental Health–PTSD
- Microbiome
- Molecular Medicine and Malaria

- Nanomedicine
- Neuroscience
- Oncology Pharmacogenomics
- Physical Therapy and Rehabilitation
- Performing Arts and Medicine
- Polypharmacy
- Polytrauma
- Social Determinants of Health
- Social Marketing
- Spinal Injury
- Stem Cells
- Student Incubator
- Sustainable Energy
- Tropical Diseases
- Urban Transportation
- Veterans Health
- Water
- Water Purification
- Wireless
- Women, Children and Family Health
- Wound-Healing

High-performing Centers *currently working across colleges and disciplines (examples listed alphabetically):*

- Advanced Medical Learning and Simulation ([CAMLS](#))
- Aging and Brain Repair ([CEABR](#))
- Alzheimer’s disease ([Byrd Institute](#))
- Assistive, Rehabilitation and Robotics Technologies ([CARRT](#))
- [Chiles Center for Healthy Mothers and Babies](#)
 - Florida Perinatal Quality Collaborative (FPQC)
 - Transdisciplinary Research in Women’s Health
- Clean Energy Research ([CERC](#))
- Community Design and Research ([FCCDR](#))
- Cybersecurity ([FC2](#))
- [Diabetes](#)
- Drug Discovery and Innovation ([CDDI](#))
- Entrepreneurship ([CFE](#))
- Environmental/Occupational Risk Analysis & Management ([CEORAM](#))
- Florida Prevention Research Center ([FPRC](#))
- Global Center for Hearing & Speech Research ([GCHSR](#))
- Global Health Infectious Diseases ([GHIDR](#))
- Inclusive Communities ([FCIC](#))
- Neuromusculoskeletal Research ([CNMSR](#))
- Oceanography ([FIO](#))
- Research in the Arts ([IRA](#))

- Sunshine Education and Research Center ([SERC](#))
- Urban Transportation Research ([CUTR](#))
- USF [CONNECT](#)
- USF [I-Corps](#)
- Virtualization and Applied Spatial Technology (CFAST)
- Wireless and Microwave Information Systems ([WAMI](#))

Regional assets *(listed alphabetically):*

- [Florida High Tech Corridor Council](#), which encourages business partnerships with local companies
- Hospitals: James A. Haley Veterans Hospital, Tampa General Hospital, All Children's Hospital, Bayfront Health System, Florida Hospital
- Local research institutes such as Florida Orthopaedic Institute
- Moffitt Cancer Center & Research Institute
- Mote Marine Laboratory
- Museums and cultural institutions
- National Oceanic and Atmospheric Administration (NOAA) fisheries
- Tampa Bay Technology Forum
- [Tampa Bay WaVE](#), with its [FirstWaVE Venture Center](#) in downtown Tampa, which has been highly successful in connecting high-growth start-ups with mentorship, early stage capital and other resources to foster a culture of innovation throughout the region
- The "C4 Intellectual Corridor" – State College, Ringling, New College, and USFSM
- U.S. Geological Survey (USGS) St. Petersburg Coastal & Marine Science Center

Interdisciplinary strengths and assets *of the USF System:*

- USF System size and [diversity](#)
- USF faculty members who are [globally engaged in research-related activities](#), in addition to educational endeavors
- USF faculty who frequently co-author articles with colleagues from other countries
- The Research Administration Improvement Network, or [TRAIN® program](#) at USF Research & Innovation, which facilitates communication among research administration professionals in the colleges and centrally, and offers multiple training programs leading to certification that enhance the quality and expertise of research administrators throughout the USF System, and ensures compliance
- The multi-college National Science Foundation Innovation Corps or [I-Corps Site program](#), one of only two in the state of Florida, which teaches faculty and students how to find the business idea behind their research and discover its potential for commercialization

Opportunities

In addition to the Six Focus Areas, opportunities exist at state, national and international levels that USF can leverage, including (listed alphabetically):

• Healthy People •

- Geroscience. The state of Florida has the highest proportion of older adults in the U.S. USF can leverage this group as a natural classroom to examine social, behavioral and medical aspects of aging. Solving problems of an aging society will become essential in the 21st century. USF is poised for leadership in this emerging research domain ([white paper on this topic](#)).
- Materials Science and Engineering. Materials are fundamental to the well-being of our society. The development, improvement and use of materials influence every technology and every living system. Therefore, it is of utmost importance to understand how materials come into being and their structures, properties and performance.
- Medical Engineering. This operates at the nexus of engineering, science, clinical medicine and public health to advance human health through fundamental biomedical explorations, discovery of treatments and cures and advancement of health promotion and disease prevention ([NIH-Wide Strategic Plan, National Institutes of Health](#)).
- National [BRAIN](#) Initiative. See Brain and Spinal Cord Focus Area, Appendix, p.22.
- Next Generation Healthcare. Issues, such as poverty and healthcare, prevention, childhood obesity, medical innovation, etc. For a more comprehensive list of these topics, visit [TEDMED](#).
- [Precision Medicine](#) Initiative. This initiative aims to develop treatments customized to a specific individual, rather than a generic ailment, through techniques such as DNA-specific medicines and tailored technologies for individual care. A curriculum in genetic counseling has already been established.
- Targeted Therapeutics. To discover new drugs to respond to emerging diseases and combat antibiotic resistance, USF has an active transdisciplinary group of researchers engaged in the development of new therapeutic materials (e.g., nano-fluids and nano-delivery systems, designer molecules) for use in health care.

• **Healthy Communities** •

- Start-ups. See *Research Translation* Focus Area, Appendix, p.26.
- Translational medicine. See *Research Translation* Focus Area, Appendix, p.26.
- Transportation. The convergence of new technologies is impacting transportation systems in ways not seen before. With a critical national portal for freight transportation, Florida is the third most populous state and the destination of over 100 million tourists annually. USF experts in this domain are uniquely positioned to serve the state of Florida and the nation, with a rich research agenda that will support the goal of attracting high-tech businesses and championing the development of automated vehicle technologies.
- Undergraduate Research and Education. Potential exists to strengthen ties with USFSP and USFSM and foster a more transdisciplinary culture early in a researcher's career.
- Trainees. USF has the capacity, ability and potential to increase the number of Ph.D. students and postdoctoral appointees. Several opportunities for training grants at federal agencies, targeting different areas, can be leveraged (e.g., [NIH-BEST](#) and [NSF-NRT](#)).
- Veterans reintegration, rehabilitation and resilience. USF is an ideal location, as about one-fourth of Florida's 1.6 million veterans reside in counties served by the three USF campuses. MacDill Air Force Base hosts U.S. Central Command, U.S. Special Operations, and the 6th Air Mobility Wing. USF is also affiliated with two major Veterans Administration hospitals: [James A. Haley VA Hospital](#) and [C.W. Bill Young VA Medical Center](#) in Bay Pines, FL.

• **Healthy Environment** •

- Big Data. See *Data Science* Focus Area, Appendix, p.23.
- Global change and development. See *Water* Focus Area, Appendix, p.27.
- Natural hazards, climate change and coastal ecosystems. See *Water* Focus Area, Appendix, p.27.

USF System Research Strategic Planning Committee

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