



# 100 University Ideas

for Enhancing Business-University  
Collaboration in Florida

Report No. 2018-02



### About the Florida Council of 100

Formed in 1961 at the request of Governor Farris Bryant, the Florida Council of 100 is a private, nonprofit, nonpartisan organization of business and civic leaders, which exists to promote the economic growth of Florida and improve the economic well-being and quality of life of its citizenry. Council members have achieved a high degree of success and recognition in their business or profession; have demonstrated involvement in Florida public policy issues; and possess the personal qualities of character, personality, and leadership ability. The Council of 100 works closely with the Governor and the state agencies, the Legislature, the judicial branch, federal leaders and officials, and other private organizations, to effect positive change in the state and achieve quality of life improvements for the citizens of Florida. Through our reports, position statements, policy letters, issue advocacy, and public relations, we keep state leaders and policy makers apprised of key topics relevant to today's Florida and make recommendations for enhancing state policies and programs in ways beneficial to all Floridians.

## INTRODUCTION

Serving as the basis for our issue understanding and recommendations in **Best Practices in Business-Academic R&D Collaboration**, the following university R&D best practices represent the recommendations suggested by the twelve state universities and the University of Miami. Each university spent considerable time completing a detailed survey regarding its R&D activities, with the largest institutions supplementing this work by granting the Florida Council of 100 extensive site visits.

The best practices reflected here are a collection of what these institutions felt would truly move the system forward to be the top R&D-producing university system in the nation. While the Florida Council of 100 supports many of these practices, we recommend that the State University System use this list to review where current R&D funding, policy, and governance structure should be amended to continue to propel the state's R&D efforts. That said, proposed practices must be balanced against results and fiscal constraints.

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# University R&D Best Practices



## Recruit More High-Powered Researchers

**Increase research capacity, output, and impact that would be most significantly impacted through the recruitment of talent, something that could be enacted through strategic area cluster hires for advancing discovery and innovation**

**In order to create pinnacles of excellence within the SUS by building a critical mass of expertise, create a program that would solicit multiple proposals from each of the Florida SUS institutions for research-centric cluster hires**

- The specific persons to be recruited may or may not have preexisting collaborations but will have research activities that sit within a common research area
- Topics should be of local, national, and international importance, tackling issues and opportunities in areas such as health care, information technology, coastal and marine science, advanced manufacturing, and others that will shape our world and society in the 21st century
- The research topics should represent pre-existing strengths at the institutions, or areas of significant importance to the institutions for future growth

**Hire one “rock star” mid- to late-career faculty researcher to nucleate each research cluster with direct participation from the university’s chief research officer**

**Hire cohorts of junior faculty into research clusters with direct participation from the university’s chief research and economic engagement officer on all new hires**

**Offer nationally-competitive start-up packages and salaries for new hires**

**Establish a start-up fund for promising junior faculty researchers**

**Make joint hires across schools and institutions**

**Transition to a dual-track hiring system that establishes research faculty and teaching faculty as separate career pathways**



# University R&D Best Practices



## Increase Faculty Engaged in Research Activities With Commercial Potential

**Lower student-to-faculty ratios in order to give researchers more time to research, establish collaborative relationships with industry representatives, and instruct students through hands-on research**

**Provide faculty more discipline-focused grant development support**

**Elevate the administrative role of the university's chief research and economic engagement officer to reflect the strategic importance of research to the university's core mission**

**Require departmental (ideally, chair-led) research support and mentorship of junior faculty**

**Increase financial support for other research personnel such as associates and student assistants**

**Expect (and, perhaps, require) each faculty member to secure, as Principal Investigator or Co-PI, at least one major grant at the national funding levels characteristic of the relevant field**

**Create an effective reward and recognition system for research productivity and excellence, including reduced course loads, preferential consideration for seed or equipment funding or lab space, summer stipends, pay raises and bonuses**

**Conduct workload rebalance study, ordering and plotting faculty teaching loads to funded research awards**

**Tie reduced teaching loads for existing faculty to increased research performance**

**Amend tenure/promotion policy to reflect greater emphasis on funded research activities**

**Develop and promote industry-academic faculty exchange programs**

- Members of industry, such as CEOs, engineers, and other professionals, can act as Visiting Industry Scholars or Professors, Research Scholars in Residence, or Volunteer Faculty. This allows industry representatives the ability to participate fully in the research, and make valuable contributions in terms of how the research can impact the industry. This also allows them to gain a comprehensive understanding of the university research process
- Faculty can also apply to work either part time or full time at the company with which they are collaborating, to perform hands-on research at the company, and to gain a full understanding on how their research can impact an industry

**Increase faculty salaries relating to commercialization**

**Enable research faculty and staff to take a sabbatical to commercialize a discovery in order to encourage more university researchers to consider the practical, real world applications of their innovations, and move research into the commercial space.**

**Create a support infrastructure for faculty consulting**

*The California Polytechnic State University San Luis Obispo campus has an innovative Visiting Faculty and Industry Scholars Program, which invites industry professionals and research scholars to volunteer their services to Cal Poly Engineering or undertake collaborative research projects on campus.*

*The Northwestern University McCormick School of Engineering and Applied Science allows entrepreneurial leave for faculty to commercialize their research for up to one year. Additionally, the University of California at Berkeley has a comprehensive support infrastructure that allows researchers to assist industry with potential new innovations, work directly with industry to enhance university research towards commercialization, and identify solutions for community technology and innovation needs.*

# University R&D Best Practices



## Provide Capital for Development / Commercialization Activities

*The Florida Institute for the Commercialization of Public Research is a statutory entity whose purpose is to assist in the commercialization of products developed by the R&D activities of an innovation business or a publicly supported college, university, or research institute. Since 2011, it has helped start-up companies raise more than \$100 million in private investment.*

*The highly competitive federal SBIR/STTR programs encourage small businesses to engage in federal R&D that has the potential for commercialization. STTR businesses must formally collaborate with a research institution.*

*The Florida High Tech Corridor Council is a 20-year, 23-county economic development initiative of UF, USF, and UCF. It manages a Matching Grants Research Program, which has invested over \$60 million in projects with an estimated economic impact of over \$1.3 billion.*

**Enable access to capital across the funding continuum — small milestone grants to pre-seed, angel, and then institutional series (A, B, C) funding**

**Provide \$50 million to start (and \$5 million annually to maintain) a seed fund for university start-ups**

- Provide matching funds to universities seeking to raise alumni donations or other funds to support technology commercialization
- Provide matching funds to existing, qualified seed funds seeking to raise other funds to support additional investment
- Support seed stage investments in Florida domiciled start-ups operating in one of the state's targeted innovation industries as identified by the Department of Economic Opportunity. Private sector matching investment would be mandatory

- Augment the Florida Institute for the Commercialization of Public Research's Florida Technology Seed Capital Fund, which provides first-round seed investments ranging from \$50,000 to \$300,000 and second-round investments ranging from \$50,000 to \$200,000. Require private-sector matching dollars

- Match Florida-focused "sidecar funds" being created by leading venture capital firms (e.g., ARCH Venture Partners, Sierra Ventures)

**Create regionally based seed funds for startups and early stage companies**

**Encourage Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) participation**

- Better align STTR efforts with universities' academic pace and schedule

**Similar to the Florida High Tech Corridor Council's longstanding program, create a Statewide Matching Grant Program for Industry-Sponsored Research at SUS institutions to incentivize industry-sponsored research projects that would develop commercially applicable emerging technologies**

- Collaboration opportunities to include researchers from all academic disciplines
- Focus on small to midsize high-tech companies
- If possible, link to federally funded SBIR/STTR programs
- Utilize existing regional economic development clusters with higher education partnerships (e.g., Life Sciences South Florida)

**Promote venture philanthropy**

# University R&D Best Practices



## Promote Basic Research at Universities

While applied science is vital, Florida must invest in basic research, too. Cutbacks to federal funding significantly reduce the university's ability to generate the initial research and knowledge needed to move an innovative concept forward, which in turn limits the potential for university-industry collaboration as the number of high-potential research projects are reduced

*Basic research, such as determining the composition of a planet, is driven by curiosity or interest rather than a desire to commercialize a practical product. It can, however, lay the foundation for future applied science and its spin-off innovations. As Dr. George Smoot of Lawrence Berkeley National Laboratory says, "People cannot foresee the future well enough to predict what's going to develop from basic research. If we only did applied research, we would still be making better spears."*



## Establish / Enhance Physical Infrastructure (Including Buildings, Equipment, and Spaces)

**Build/enhance infrastructure in direct support of research clusters of strategic emphasis**

**Provide more high quality research space as a researcher recruitment tool, to house new, specialized equipment, and to enable more simultaneous work**

**Expand research equipment fund availability**

**Focus investments in research infrastructure on those that yield maximum impacts for research competitiveness and in particular equipment and instrumentation for institutional shared facilities. The research areas supported by the shared facility should represent pre-existing strengths at the institution, or areas of significant importance to the institution for future growth**

**Make investments in SUS-wide shared facilities such as the Sunshine State Education and Research Computing Alliance (SSERCA), a collaborative effort by six Florida public universities and one private university to build a big-data research infrastructure for the State University System. This first-of-its-kind venture will provide the massive research computing power necessary to handle the challenges of sharing large data sets over long distances among multiple researchers. Creating a statewide network of computing infrastructure and expertise in the SUS will give Florida significant advantage in innovative approaches to addressing "big data" challenges**

**Renovate existing laboratories**

# University R&D Best Practices



## Improve Communication Between Business and Academia

*The I/UCRC model links faculty and students from different academic institutions with “members” (i.e., companies, governments, nonprofits) to perform cutting-edge pre-competitive basic research in STEM areas that interest industry and which can drive innovation and economic impact. I/UCRCs help members leverage their financial investment by accelerating their knowledge base in new sectors. NSF supports the development and growth of I/UCRCs, providing a procedural and financial framework for membership and operations and disseminating best practices.*

**Help entities to collaborate, potentially by using the National Science Foundation Industry / University Cooperative Research Center (I/UCRC) model**

**Find clearer ways to translate university budget mechanics into private sector terms**

**Develop more effective ways to resolve / prevent intellectual property (IP) ownership disputes resulting from collaborative university-business efforts**

- Create standard IP agreements with industry collaborators — The ability to develop a standardized IP agreement specific to industry/university partnerships can encourage collaboration and significantly reduce the amount of time necessary to being the research project. This should be a cooperative activity between the university and representatives from industry to ensure that the interests of both parties are considered and met
- Potential IP issues include distribution of financial returns and ownership rights, use of third-party funding, legal responsibility for patenting, publicization of results, and stewardship of follow-on research

**Create master agreements with partners that do multiple projects with the university. This reduces the time to create individual contractual arrangements for separate collaborative research projects**

**Develop ways to resolve conflicts between university and industry regarding the direction of their collaborative research. For example, university researchers may wish to head in one direction for scientific knowledge, while industry researchers may require that ongoing research be focused on evolving a specific product to maintain profit and market share**

**Make state policies more collaboration- and industry-friendly**



# University R&D Best Practices



## Improve Communication Between Business and Academia (continued)

Create an online web portal that allows interested third parties to research the discoveries developed by university innovators. Third parties can search patented or patent-pending discoveries by research topic area, by browsing through all technology, or by those technologies immediately available for commercialization

Create match-making programs designed to educate the corporate world on the benefits and potential cost-effectiveness of university-corporation collaborations and formalized sponsored research. Risk, cost, corporations' desire for complete ownership and confidentiality of research results, and calendar time are the chief hurdles

- Maintain a list of potential companies and entrepreneurs, and the type of technology or inventions that may interest them

**Host networking events to connect researchers and entrepreneurs**

**Host community-sponsored pitch days to allow inventors to network with entrepreneurs, companies, and investors**

**Develop more effective ways to address compliance and conflict of interest issues during an agreement**

**Invest in the creation of university-business consortia — Members of a university/industry consortium that focuses on a specific industry have the ability to work collaboratively to address research and market needs, technology transfer, and commercialization issues facing both industry and government. Working together, consortium members can identify the issues, the interests of all involved parties, and work towards creative solutions**

**Establish dynamic, high-profile school and departmental external advisory committees composed of leaders in similar fields from research-intensive entities**

**Overcome the nationwide condition that companies are reluctant to fund university research**

*A consortium of universities and businesses provides universities with ways to commercialize their research and businesses with access to basic research and intellectual property. For example, at the Future Renewable Electric Energy Delivery and Management (FREEDM) Systems Engineering Research Center at North Carolina State University, universities from across the U.S. (including FAMU and FSU) have joined forces with industry partners to create a more secure, sustainable electric grid. Similarly, SUNY Poly SEMATECH, a 12-member global consortium of major computer chip manufacturers and universities, coordinates next-generation R&D programs in lithography, interconnects, metrology, and emerging nanotechnology-driven applications.*

# University R&D Best Practices



## Provide Experts and Staff to Guide Universities Through Development / Commercialization Activities

**Provide universities with access to experts at every stage of commercialization — not just “been there, done that” advisors, but structured Executive-in-Residence programs**

**If a university doesn’t have enough staff/resources to manage complex commercialization activities, find some alternatives**

- Have a larger university add a smaller university’s portfolio to its tech transfer operations
- Have small universities pool and market their intellectual property
- Create a statewide office for commercializing university IP, which could strategically package and market multi-institutional patents
- Review and revise Center and Institute policies to emphasize funded research and external engagement, including (when appropriate) hiring of technical program manager positions

### Create a statewide concierge service for compliance issues

*University researchers, with instructional and other institutional responsibilities, may not have the time or resources to fully educate themselves on the specific compliance issues that may impact their research projects. Created on an institutional or statewide basis, a centralized compliance concierge service, similar to the University of Oregon’s Research Compliance Services, could help all R&D stakeholders ensure research integrity and regulatory compliance. Benefits would include more efficiently helping navigate institutional review board complexities; reducing time and resources spent identifying and implementing regulations and requirements; identifying potential conflicts of interest; and preventing or investigating research misconduct.*

# University R&D Best Practices



## Provide Experts and Staff to Guide Universities Through Development / Commercialization Activities (continued)

### Expand Innovation Corps (I-Corps) throughout Florida

### Expand the Technology Commercialization Accelerator Program (TCAP) in Florida

*A joint effort by the FAMU-FSU College of Engineering, the Florida Institute for the Commercialization of Public Research, and Domi Station (a Tallahassee-based non-profit startup incubator), TCAP is an intensive seven-week course that pairs faculty inventors with postdoctoral researchers, graduate students, and a business mentor to determine if a technology is commercializable. Each team learns how to test their ideas, understand customer demand, size-up competition, and create partnerships, winning a \$3,000 continuation grant if successful.*

*The National Science Foundation has developed an effective training method (I-Corps) to accelerate the conversion of basic research into products and start-ups. Led by I-Corps teams composed of a technical lead, an entrepreneurial lead, and an I-Corps mentor (all specially trained), I-Corps sites provide infrastructure, training, expertise, networking opportunities, and some funding to help researchers commercialize their work. A national leader, Florida currently has two I-Corps sites (UCF, USF) and seven universities with I-Corps teams (USF, UCF, FIU, FIT, FSU, FAMU, UF).*

# University R&D Best Practices



## Create Incubators and Accelerators

*The University of Florida's Innovation Hub has state-of-the-art lab and office space for select tenants. Additionally, UF's Innovation Academy is a groundbreaking living / learning community for academically talented students wanting to practice entrepreneurship.*

*The Empower Accelerator is StartUP FIU's comprehensive, 14-week program to develop scalable traditional and social entrepreneurship ventures. The program provides coaches, skills training, a cutting-edge workspace, and additional resources to both first-time and experienced entrepreneurs.*

*USF CONNECT, USF's business and economic development initiative that supports technology start-ups, includes two incubators: the classic Tampa Bay Technology Incubator and a Student Innovation Incubator in which student ventures with commercial potential are given access to high-tech, collaborative office space and paired with industry mentors and community corporate partners.*

**Create and expand commercialization / research incubators for startup companies, research and development incubator facilities, and business incubators**

**Create a start-up accelerator program focused on the Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) programs. The funding received would help build prototypes which will help start-up companies commercialize licensed university developed technology. A strong example of one of these types of programs is the University of Pennsylvania's UPStart program**

**Build easily accessible construction areas ("maker spaces") with mechanical and electrical tools where innovators could go to build prototypes that involve mechanical parts, 3D printed parts, electronic circuits, etc.**



## Recruit More High-Powered Students

**Employ predictive analytics to admission policies for recruitment of a high-performing student body**

**Provide increasing support to high-performing graduate programs, including establishment of doctoral programs in research cluster areas**

**Develop and promote industry-student exchange programs**

**Create an Undergraduate Research Scholar Grant Program to provide select students the opportunity to engage in research away from the home institution (state/federal, public/private, etc.), including funding for travel, tuition, and a modest stipend for living expenses**

**Support research at the undergraduate level by providing resources for undergraduates to participate in immersive research experiences outside of the classroom. Funds could also be used for graduate assistantships to facilitate near-peer research mentoring. Funded activities must be associated with faculty-initiated research of benefit to the state and beyond**

# University R&D Best Practices



## Provide Matching Funds to Attract New “Super” Programs

Attract one of the multiple Engineering Research Centers (ERCs) funded by the National Science Foundation across the country. Managed by research universities, the ERCs encourage advanced research through multi-disciplinary research activities towards advanced, complex engineering systems and encouraging industry/university collaborative research partnerships

Create more Industry-University Research Centers (I/UCRC) — For this type of research center, the National Science Foundation provides seed funding (just \$50,000 annually) for collaboration with industry. Companies with interest in the specific R&D area of the I/UCRC become paying members. The I/UCRC essentially conducts R&D that serves the needs of the companies. (See also the description of the I/UCRC model on page 8.)

Create a mechanism for encouraging and managing the contribution of matching funds from government, industry, and philanthropy needed to bring large research centers and similar initiatives to Florida



## Optimize State R&D Funding

Reexamine the State University System funding formula, which, regarding growing the research function, favors universities with either historically high research activity levels or large population bases that fuel enrollment growth

Increase funding for university-business research activities that aren't funded by either the company or the federal government

Provide tax and other incentives so that universities can become strong research partners for industry



## Increase Entrepreneurship

Find experienced entrepreneurs who will accept the risk of technology-to-product development and are willing to mentor a new crop of entrepreneurs

Replicate Ohio's Entrepreneurial Services Provider (ESP) Program, which addresses three known problems with universities moving ideas to the market: capital, talent, and services

*Geared toward building Ohio's strategic, technology-based sectors having extraordinary economic development potential, the goal of the ESP Program is to increase the state's entrepreneurial commercialization outcomes by supporting and accelerating promising concept, seed, and early stage companies. Each regional ESP provides firms with access to capital as well as coordinated business services such as mentoring and talent recruitment.*



# University R&D Best Practices

*Located next to UCF, the Central Florida Research Park is a campus-like environment for businesses. Firms that want a “university relationship” can buy land in the CFRP for a facility or lease space for office, lab, or manufacturing purposes. Tenants interact with the university via research, faculty consultations, student internships, part-time employment programs, and technology transfer and can even contract with UCF for computer resources or lab space.*

*CFRP is the largest research park in Florida (1,027 acres), the 4th largest in the U.S. by number of companies (126), and the 7th largest in the U.S. by number of employees (10,000). Generating billions of dollars of commercial and research contracts annually, it is home to numerous centers hosted by the U.S. DoD, UCF, and corporations. Among its tenants are the UCF Institute for Simulation and Training, the National Center for Simulation, and the Naval Air Warfare Center Training Systems Division (all parts of the area’s renowned Modeling, Simulation & Training cluster), as well as the UCF Technology Incubator and firms such as Northrop Grumman, Raytheon, Siemens, General Dynamics, Hewlett-Packard, and AT&T.*



## Construct / Enhance Industry-Focused Research Parks and Innovation Districts

**With community partners, create parks that would include multiple private industry and government facilities (including national centers) which perform collaborative research with the university**

- Many of these companies can be affiliated with specific colleges within the university or aligned with regional industry clusters

**Invest in the creation of robust innovation districts, including partnerships among local universities, developers, state and local governments, private R&D organizations, large and small companies, etc.**

*Located at the intersection of a global marketplace and one of the largest health districts in the nation, Converge Miami is a vibrant urban knowledge community. It provides mixed-use facilities with labs, offices, retail shops, restaurants, and industry-leading amenities to public organizations and private companies. Near the heart of Miami, the Miller School of Medicine, and the Miami Health District that services over 1.5 million outpatient visits per year, the Converge Miami facilitates access to outstanding resources and creates synergies between the University of Miami and tenant companies, advancing clinical breakthroughs and benefiting all people.*

*Tampa’s !p is a multi-jurisdictional innovation district and designated TechHire Community anchored by five globally-recognized institutions: the University of South Florida, Busch Gardens, Moffitt Cancer Center, Florida Hospital, and RD Management at University Mall. These institutions and others in the district will drive more than \$2 billion in economic activity over the next three years, engaging tens of thousands of students, educators, workers, patients and millions of tourists. Tampa’s !p is building an engaged community recognized for igniting discoveries in technology, health care, digital media, transportation and more.*

# University R&D Best Practices



## Develop Policies, Procedures, and Tools to Help Researchers From Different Entities Collaborate

Address a myriad of topics that could be at issue between collaborators, including required security clearances, research location(s), inter-institutional communication methods, facility and resource access, safety and risk management, and training needs

**Statewide Agreements for Joint Work** — Collaborative research agreements between universities is an often overlooked aspect of the research process. Many universities are conducting parallel research, or research activities that can complement other research projects across the state. However, individual institutions each operate using their processes, and have their own specific collaborative research agreements. Developing a statewide agreement for joint research between universities would significantly reduce many of the obstacles facing universities when inter-institutional research is being performed. Having a statewide standard for university research collaborations would also encourage more research projects and move new innovations closer to the commercialization process



## Target Industry-Academic Interactions Based on Industry Need

Identify research clusters of strategic emphasis

Shift the state's industrial mix more toward sectors that invest in R&D

Invest more in Florida bio/life science companies



## Increase the Number and Scope of Partnerships

Establish strategic partnerships with one or more Fortune 500 companies and/or federal research labs / national centers to promote and enhance the university's key areas of strategic emphasis

Expand the breadth and depth of the university's strategic partnerships with external entities (foreign and domestic, public and private) for use as institutional force multipliers

Diversify extramural research portfolio to include industry, foundation, foreign, and U.S. federal funding sources

# University R&D Best Practices



## Hedge Against Risk

Establish a corporation to assume the risk of some forms of research that an academic institution cannot assume



## Broaden Marketing Initiatives

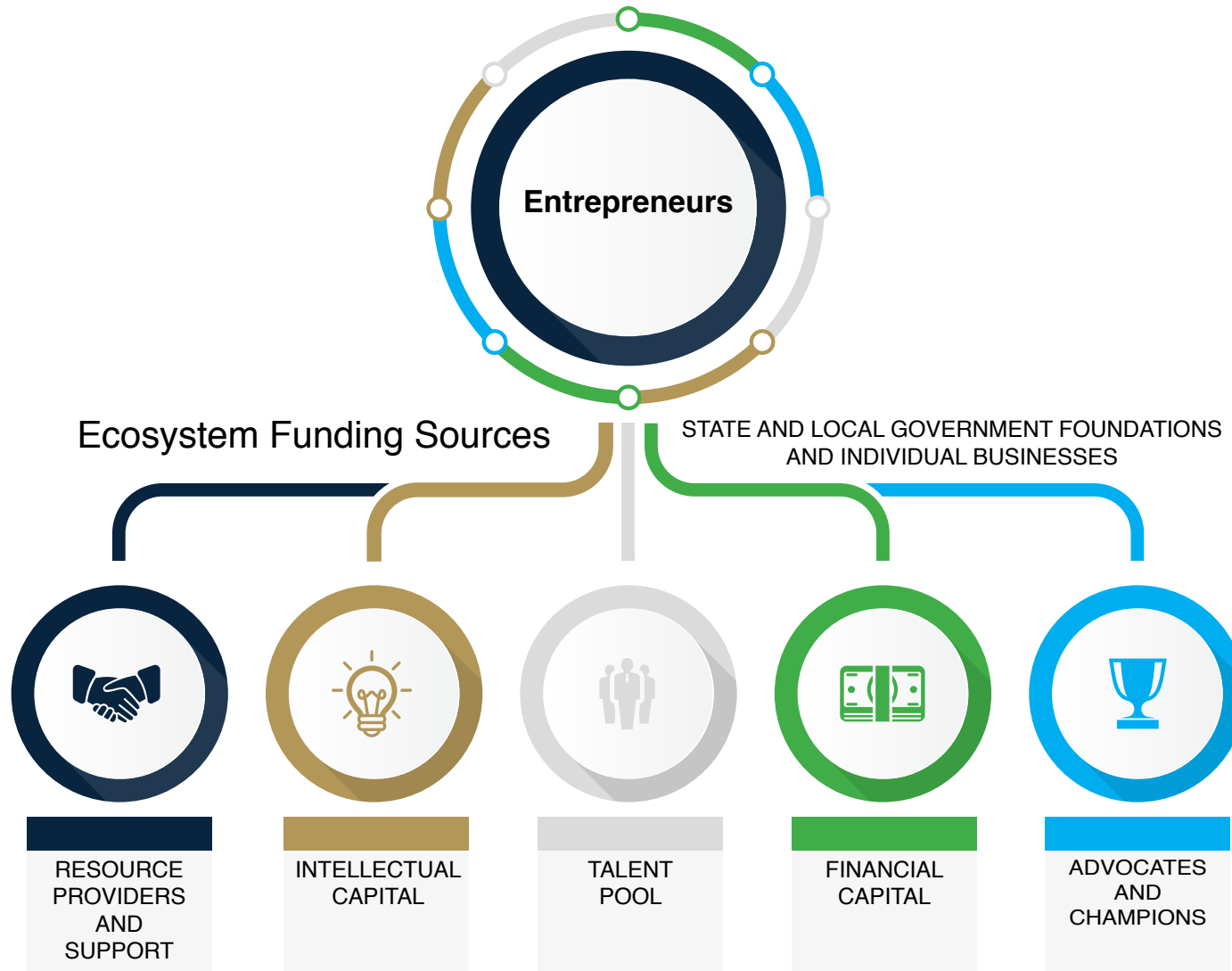
Market university research, education, and training services to foreign and federal audiences, including national governments, industry actors, and research entities

Expand and enhance the depth and visibility of the university's economic engagement activities at the local and regional levels, including increasing its physical presence in strategic locations throughout the primary service region

# University R&D Best Practices



## Invest in Florida's Innovation Ecosystem



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## 100 University Ideas for Enhancing Business-University Collaboration in Florida

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