

## **Hemispheric Innovation Hub**

### **SUMMARY**

#### **Initial Charge**

The Hemispheric Innovation Hub working group will develop a vision for the University of Miami to be a catalyst for innovation and new ventures that encourage entrepreneurship, enable collaboration, and spur product development. The hub is a vehicle for commercialization through strategic capital investments, scaling great ideas regionally and globally, and fostering connections locally and throughout the hemisphere.

Creativity, innovation and entrepreneurship are intrinsically linked, and UM is an effective nurturing environment for all three. For the purposes of this paper, creativity is defined as the mindset, inspiration and flexible thinking that challenges the known and draws upon the unknown to produce novel results and solutions, while the novel solution and corresponding mechanism and process of delivery is innovation; and finally, entrepreneurship transforms an innovation into a value generating enterprise.

#### **Proposals**

##### **A. Enhance internal operations**

- Create the atmosphere for innovation from the top.
- Embed opportunities to learn about innovation.
- Streamline the process from creation to protection.
- Develop new staff capacities to speed work on innovation.
- Launch University of Miami Enterprise (UM Enterprise), a university-wide ecosystem to support innovation.
- Make accessible physical and virtual work spaces.
- Advance specific projects with great potential.

##### **B. Develop external partners**

- Create guiding principles for the development of partners in the hemisphere.
- Increase opportunities for faculty and staff to interact with colleagues from targeted countries in the hemisphere.

#### **Measuring Progress**

Measures of success should not be limited to revenue generation, but should also include:

- Number and quality of publications, licenses, options, patents, copyrights, and Small Business Innovation Research (SBIR) proposals submitted and awarded, startups and follow-on funding for licensed technologies.
- Number of related faculty who are called upon as experts externally (consulting, speakers).
- Number of faculty, alumni and student startups and partnerships.
- Increased revenue.
- Innovation ranking.

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## Introduction

To position the University of Miami (UM) as a hemispheric hub for innovation, an ambitious, intentional effort is required to surface strengths and existing initiatives across the university; build a culture that nurtures innovation; deepen opportunities for students, faculty and staff to learn about and participate together in innovative work; develop the tools and resources to advance great ideas; and develop external partnerships. As noted scientist Charles Darwin said, “It is not the strongest of the species that survive, nor the most intelligent that survives, it is the one who is the most adaptable to change.” *Universities must adapt to survive in this global economy.*

Multidisciplinary work related to innovation is occurring at UM, but to successfully position the University as a powerful commercialization engine requires the addition of resources to existing infrastructure, development of new infrastructure, and strategic thinking and process development that will enable smooth and timely establishment of strategic external partnerships.

## A. ENHANCE INTERNAL OPERATIONS

A spirit of entrepreneurship is already tightly woven into the fabric of the University of Miami. To strengthen innovation and the capacity to scale innovative ideas in the world, the University must unite around a common vision and set of initiatives that are equally supported at each campus, tailored to the unique needs of each campus, and linked across campuses to enhance collaboration. Initial evidence indicates many examples of innovation at the medical school, perhaps not surprisingly given the major emphasis on, and external funding for, groundbreaking medical research and interventions. The Wallace H. Coulter Center for Translational Research has supported promising biomedical technologies, providing \$2.7M in funding and business development support to 29 projects that have received \$97.5M of follow-on funding by venture capitalists, angel investors, and private donors. Student innovation has been supported with great success by the Launch Pad, with over 270 companies and 900 jobs created within the Launch Pad by students and alumni. Under the leadership of the Vice Provost for Innovation, the reorganized Office of Technology Transfer has produced a seven-fold increase in IP revenues, a four-fold increase in licenses, and the creation of 87.5% of all UM startups in the past four years. Key to taking innovation at UM to the next level is multidisciplinary interactions among medicine, science, engineering, information technology and other fields.

### ***Proposal 1: Create the atmosphere for innovation***

The University of Miami needs to adopt a more opportunistic, less risk averse culture to foster innovation. This will require leadership to invest in people, technology, space and seed funding. Some initial recommendations include:

- **Empower faculty:** Provide more explicit support for faculty innovation. Embrace entrepreneurship, inventions, patents (both provisional and issued), grants and startup initiatives as part of promotion and tenure review criteria. Develop ways to recognize interdisciplinary innovation within schools and colleges. Consider hemispheric partnerships and other efforts that emerge from cutting-edge work in performance review processes.
- **Prioritize innovation in selection:** Hire/admit faculty and students with demonstrated ability to innovate.
- **Empower students and trainees (residents, post-docs):** Every school and college should consider opportunities within their course offerings to incorporate creativity and innovation through content and/or pedagogy. As an illustration, the Frost School of Music curricular encourages all students to understand songwriting, ensuring they can learn to better collaborate to produce new music. In addition, courses in music, business, entrepreneurship, and music technology are required for all

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undergraduate students. Current awards for innovation include the [University of Miami Business Plan Competition](#) hosted by the School of Business Administration and the new [ACC InVenture Prize](#). Innovation should be included as a scoring and program component in all such competitions and all schools and colleges should develop interdisciplinary teams to compete on the campus level for the ACC competition and in other competitions whenever possible.

### ***Proposal 2: Embed opportunities to learn about innovation***

Faculty, graduate students and post-doctoral fellows need to be offered professional development that exposes them to the commercialization processes related to bringing innovative ideas to market, whilst working within an academic institution. These skills include the ability to:

- recognize innovation;
- understand value creation;
- provide a culture for innovation;
- implement innovation;
- understand patents, publishing, copyrights and differences between inventorship and authorship, and a publishable discovery and innovation that can be commercialized;
- implement entrepreneurial principles;
- recognize the need for experienced business advisors; and
- understand the difference between academic research projects and commercial projects.

Below are a suggested number of avenues for embedding this work in existing channels at UM:

- Modify the mission statement to reflect innovation as a key component of UM's identity. Update the UM Faculty Manual to include innovation and embed in each school and college innovation metrics for gauging impact, relevant to their discipline.
- Develop and deliver entrepreneurship [courses through Ulearn](#). Stakeholders involved in translation, i.e., Launch Pad, U Innovation etc. should participate in course development.
- Extend and expand the current UM partnership with [the Eureka Institute](#), which works to apply discoveries from different disciplines to benefit of human health. Under the current two-year partnership agreement between the Eureka Institute and the Clinical & Translational Science Institute (CTSI), UM is training four faculty members a year to learn about innovation, networking and commercialization.

Our goal is to build a sufficient number of innovation educators to:

- build a formal program of teaching innovation to trainees;
- serve as key anchors for the culture we want to build across campus;
- serve as a pool of advisors/invention disclosure reviewers to U Innovation; and
- replicate this program with our hemispheric partners.
- Encourage faculty to apply for iCorps awards, a federally-sponsored award to train the trainers in innovation. UM is already working with USF to apply for iCorps funding, and the CTSI has proposed to support \$50K of training activities in FY17. A iCorps grant has been submitted through the College of Engineering, which would support 30 project teams per year.
- Create an innovation mentorship system and establish a network using the Coulter Center model. Advertise the Venture Coaching Program available through Launch Pad.
- In addition to the U Innovation Concept to Commercialization (C2C), organize workshops and seminars taught by innovators. C2C will operate in conjunction with Venture Café, beginning fall of 2016, to draw a broader audience and further develop the innovation ecosystem around the University.

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- Embed innovation in the curriculum. One such example is the [Pathways of Emphasis curricular program at the Miller School of Medicine](#).
- Create additional opportunities for graduate students to participate in internships at startups – biotech, pharma, engineering, music companies, NGOs, etc. – to learn about innovation and entrepreneurship. Such opportunities could also pave the way for deeper partnerships.
- Create central budget to bring world-class innovators to campus to speak.

University leadership (President, Office of the Provost and deans) should continue to work with the faculty senate, department chairs and all relevant stakeholders to foster a shared culture of innovation across UM, building on current initiatives and visibly increasing the University's work in this area.

### ***Proposal 3: Streamline the process from creation to protection***

Existing programming through U Innovation assists with the translation of innovative research into products and services. For a patent to be strong, the inventors must be the 'first to file' the invention. Filing a provisional patent will not protect an idea unless the filing includes data that can be used ultimately to make strong claim in a non-provisional patent. A balance between having enough data to support strong claims and protection of existing data is key and is influenced by the resources available for project development, as well as the product potential of the innovation.

#### **Options for consideration to implement the updated U.S. "first to file" patent policy include:**

- Support filing provisional patents: Public disclosures of any patentable technology should be avoided to prevent the theft of intellectual property. Since faculty and students are encouraged to publish their emerging work and many grant applications require the disclosure of new technologies, faculty and students should seek the guidance of OTT.
- Clarify timelines: Guidelines are unclear for Confidential Disclosure Agreements (CDA) and Material Transfer Agreements (MTA), which are contracts that protect inventions. A timeline developed by the OTT with clear points of contact for each stage of the process, and made publicly available would be beneficial. Inventors should have the ability to check the status of their disclosures, patents, etc. through a secure online portal, also enabling chairs and deans to see the progress of work.
- Faculty and student rights: A new IP policy, which will be in effect on June 1, 2016, states the circumstances under which students own their IP and outlines when exceptions occur such that the University would own the IP. The option for OTT to file patents from students, post-doctoral fellows and trainees should be investigated. All inventors whose inventions are owned by UM need to assign their invention to the University and not directly to a startup or other entity. The University should be the sole vehicle assigning any rights to other entities.
- Public impact: The OTT should be incentivized by the University to maximize output. Innovation with a high public impact may not yield high financial returns but can contribute significantly to the University's relevance and reputation. Minimum royalties and other fixed fees from startups should be eliminated and replaced by performance standards that indicate that best efforts are being practiced to commercialize/ scale. UM should have an ownership interest in the startup that is subject to dilution as well as equity stakes of key employees in startup companies. Royalties can continue, however, there needs to be a mechanism of converting royalties to ownership, as it is easier to finance a startup without accounting for royalties (perhaps a floor on dilution can replace royalties). The University needs to be flexible in this regard.
- Entrepreneurs in Residence (EIR) should be strengthened by ensuring compensation at competitive levels.

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### ***Proposal 4: Develop new staff capacities***

Existing personnel explicitly supporting innovation include the Chief Innovation Officer (CIO) and Vice Provost for Innovation (VPI). This single position has dual reporting roles, serving as the CIO within the UHealth system and as the VPI in the Office of the Provost. The core functions of the CIO/VPI are to:

- evaluate new invention or idea disclosures;
- work with approved UM law firms to file patents;
- negotiate licensing, option and asset purchase agreements, as well as CDAs and outgoing MTAs;
- identify partners and investors for UM technologies;
- provide mentorship and business guidance through networks of business advisors;
- identify promising UM technologies and connect faculty to collaborators, OTT, Coulter Center and other resources;
- service as the liaison to the Life and Science Technology Park (LSTP); and
- develop the innovation ecosystem across the University.

The University of Miami should consider the position of a Chief Innovation and Entrepreneurship Officer (CIEO) to develop and coordinate university-wide innovation efforts across all three campuses. This position builds upon the success of having a dedicated Chief Innovation Officer within the UHealth system and offers similar support to the rest of the institution. The Quad recommends that the CIEO report to the President and meet regularly with the Innovation Advisory Board to identify options to establish UM Enterprise, a university-wide effort to spur innovation by:

- Creating an environment for innovation
- Increasing opportunities for students and faculty to learn about innovation
- Identifying and working with key stakeholders throughout the institution to ensure systems and support for innovation
- Collaborating with the OTT to provide university-wide mentorship programs and courses
- Overseeing collaborative/maker spaces
- Encouraging the development of new external resources to support innovation

Schools and colleges should identify existing personnel to serve as Business Development Leaders (BDLs) who will proactively support innovation in each school and college. BDLs will serve as the connector for faculty and students to the University's innovation resources in collaboration with UM Enterprise.

A position, such as a Strategic Partnerships senior leader, should be considered to foster relationships with academic institutions, companies, consuls and governments in the hemisphere to work jointly on research, innovation, and technology projects.

### ***Proposal 5: University of Miami Enterprise***

UM Enterprise will largely be responsible for creating the conditions for more innovative ideas and inventions to germinate at UM. The OTT will continue to support initiatives when they are ready to engage in the steps needed to bring them to market. Below are some suggested components for the UM Enterprise model:

- Innovation Advisory Board: Build a leadership group to provide guidance and recommendations to the President, comprising of Chief Innovation Officer and Vice Provost for Innovation, CIEO, Strategic Partnerships senior leader, schools and colleges innovation & business leaders, their deans of research and Provost.

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- Innovation space & tools: Create a central inventory of all the facilities that can be used for related work (i.e. maker spaces, labs, core facilities) and related equipment. The CEO's office would maintain systems for scheduling and loaning of equipment etc. to ensure access across the University.
- Launch Pad: For some innovators, the journey ends at patent sale. However, where there is an interest, Launch Pad will support the development of the skills of entrepreneurship to further great ideas. Launch Pad should be expanded from serving only students and alumni to include faculty and staff, with new policies as needed.
- University leadership: University leaders should encourage the creativity and innovation regardless of the perceived financial reward. This is essential to encouraging the culture of experimentation that will ultimately result in successful initiatives, and existing policies and guidelines can ensure the University is protected while also fostering real creativity.
- Central point of contact: UM Enterprise would serve as a visible, streamlined entry point for external accelerators, companies, government agencies and others seeking to work with UM.
- Offices of Research, Undergraduate Research and Community Outreach, and Civic and Community Engagement: These and other offices encouraging experimentation and experiential work are rich channels for innovation and should closely coordinate with the Chief Innovation Officer/Vice Provost for Innovation and CEO.
- Florida Institute for the Commercialization of Public Research: Build on the success of this initiative in which six UM companies have received funding and two more are in the pipeline. U Innovation has helped identify CEOs for several of our startups, including startups with released technology.
- Seed funding: UM Enterprise will benefit from dedicated personnel who is focused on maximizing available funds and attracting new funds. Existing funding should be leveraged whenever possible to attract new investments. Accelerator funds can be used to augment UM funds, but the accelerators first want to see financial commitment from the University. There are many ways that seed money could be structured creatively to catalyze further work: a fund for innovation could offer students and alumni seed investments and a prototyping fund could support initial product development. Several institutions with seed investment mechanisms include:
  - [UCLA](#) has a fund with over \$250 million in seed money for startups.
  - Children's Hospital of Philadelphia ([CHOP](#)) invested \$72 million into Spark Therapeutics (\$50 MM in first round, \$22 MM in second round with Sofinova and Baker Brothers who invested \$50 MM). CHOP also worked with a local accelerator company to identify and fund four startup companies/year (\$250k/company) focused on technology.
  - [Iowa State invests in students](#) who pursue innovation during the summer.
  - [Yale University's Office of Cooperative Research](#) invests in entrepreneurs.

The University should explore immediate routes to seek seed funding.

### ***Proposal 6: Physical and virtual facilities***

The University of Miami should provide spaces – both physical and virtual - to encourage the sharing and testing of ideas in ways that encourage collaboration and cross-pollination.

Life Science and Technology Park (LSTP): LSTP is near the medical campus and is designed to promote research and inspire collaboration between the University and external organizations. LSTP offers many amenities to startups and others including labs and maker spaces. They have plans to build an Innovation Café where those with an interest in innovation can gather.

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Coral Gables/RSMAS Campuses: Currently there are no spaces designated for innovation on these campuses, yet there has been promising conversation recognizing this need. UM should review existing spaces on both the Coral Gables and RSMAS campuses to identify possibilities. In the short term, the University could consider renovating the machine shop in the McArthur Engineering building with the needs of entrepreneurs in mind and this space should be made accessible to the broader campus 24/7. If the demand for maker space exceeds what can be accommodated with existing spaces, new spaces should be developed on the Gables Campus to foster collaboration (i.e., Library Learning Commons and new 'LSTP like' building) and, if required, on RSMAS.

Virtual structures: The University should take advantage of advancement in online communities, tools and resources to increase channels for collaboration.

- UM Enterprise: Build UM Enterprise online initially to enable the UM community to learn where to go, who to contact, and what services are available.
- PURE Elsevier: This tool which aggregates our collective effort on interdisciplinary clinical and translational research should be used by the Hemispheric Innovation Hub as a marketing tool and its use should be extended beyond clinical innovation.
- eVeritas: Use this and other existing UM channels to highlight the new U Innovation newsletter (2 editions published to date). Continue to regularly highlight license agreements and other milestones that would draw entrepreneurs to one another.
- Website: Redesign the University website to make it more interactive and intuitive. The site should include more information on innovation, entrepreneurship and commercialization and related topics, and should more actively convey UM's success in research, creativity, and innovation. Using more sophisticated analytics on the University website could result in data to inform ways to make the site more responsive to key audiences. Secure web-based tools will need to be developed to encourage international teams of inventors, investors and others to collaborate privately and efficiently. A review of the approaches from peer institutions could inform this work.

### ***Proposal 7: Select and advance specific projects***

The global financial climate greatly influences the choices investors make. Successful innovation hubs have anchored their innovation in niche areas that emphasize their unique capacities. The University should perform a rigorous review of existing and emergent strengths and capacities to inform strategic area(s) of focus. This analysis should not limit innovation in other areas. As a suggested starting point these existing units have considerable brand recognition and a consistent track record of innovation:

- Bascom Palmer Eye Institute
- Sylvester Cancer Center
- RSMAS
- Infectious Diseases (e.g. Zika virus)
- Public Health and Epidemiology
- Frost School of Music
- Spinal Trauma/Neurosurgery

Preliminary Innovation Committee: A Preliminary Innovation Committee (PIC) should be developed with the support of the President, Provost and Vice Provost for Innovation. The PIC can include the Coulter Center committee which is comprised of VC, angel investors, pharma, device/diagnostic companies and entrepreneurs. The PIC can also include key representatives from the various colleges. Audits to determine which technologies should be advanced are occurring in the medical school through U Innovation (OTT and Coulter Center) and should be extended to Coral Gables and RSMAS campuses. The results should be reported to the PIC. In Year 1, the PIC should select one innovative research technology to be commercialized with support from UM leadership.

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Once projects are selected, a management structure should be devised that reinforces a collaborative cross-college approach. A single project might draw on people and resources from medicine, engineering, business, finance, legal and other units, for example. The CIEO can support and help track such interdisciplinary efforts drawing on existing collaborations such as joint faculty appointments. Projects will draw personnel and resources together in order to meet the needs of the projects and so by nature may be temporary arrangements.

### **B. DEVELOP EXTERNAL PARTNERSHIPS**

University of Miami's prime location establishes it as a gateway to Latin America and the Caribbean. Miami is a vibrant banking, freight, culture and communications hub for the hemisphere. The University of Miami has a unique opportunity to be a hub for collaboration and innovation, but only if it can identify external partners that will both further innovation and build on the strengths of its faculty to benefit and sustain the University itself. The ownership and exploitation of mutual intellectual property generated from any such collaboration needs to be clearly defined for each partnership.

#### ***Proposal 8: Create guiding principles for the development of partners in the hemisphere.***

External partners can be identified by considering the potential impact and fit for existing expertise on campus. This internal analysis can be augmented by a few other alignment and research activities that can lay a solid foundation to guide partnership choices:

- establish a clear list of requirements for hemispheric partnerships with approval from the PIC;
- identify countries that can mutually contribute to advancing innovation. Countries that should be considered include Mexico, Peru, Columbia, Brazil and Argentina;
- identify hemispheric partnerships currently in existence. The Center for Computational Science's collaboration with the [Yucatan State Government's Information Technologies Innovation Center](#) is one example, however, there are likely others. Learn more about the motivation behind these existing efforts;
- develop criteria for partners who seek to establish a presence at the University (e.g., they must pay their own way, joint ventures, etc.); and
- evaluate the benefit of establishing an institution with its own building to foster these relationships.

#### ***Proposal 9: Increase opportunities for faculty and staff to interact with colleagues from targeted countries in the hemisphere.***

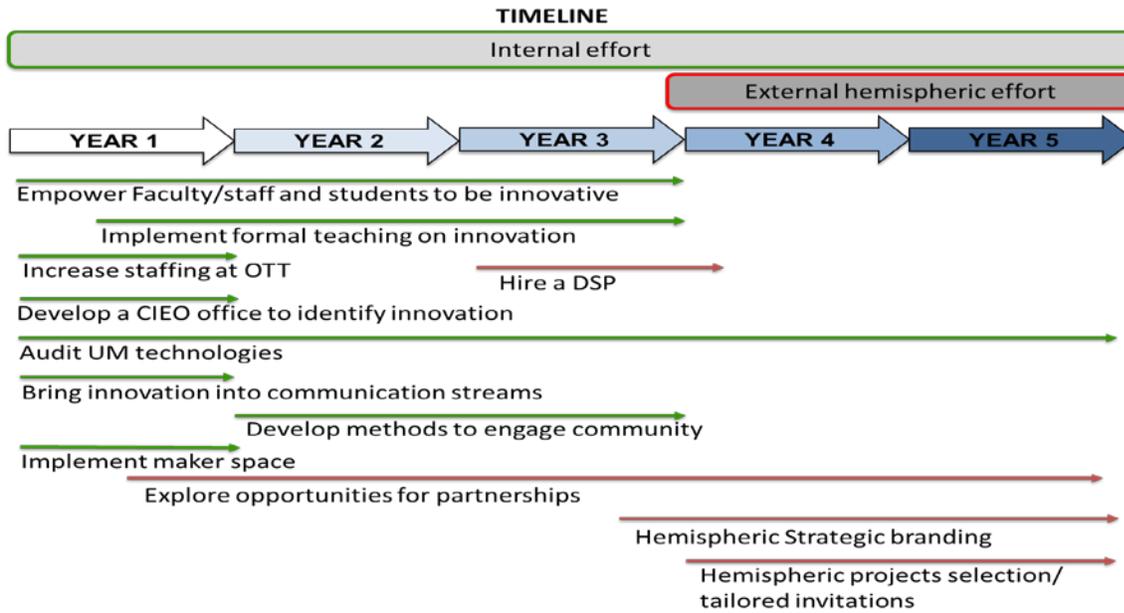
Relationships can be nurtured through various opportunities to meet and work with individuals and organizations from targeted countries. Some initial ideas:

- increase opportunities for UM faculty to attend conference and exhibitions to share their work, meet new colleagues and assess the potential for strategic alliances with targeted countries. For example, the connection with Yucatan developed from an eMerge conference presentation by the Center for Computational Science (CCS);
- develop an annual event that draws consuls and companies from target countries in the hemisphere to UM; and
- where beneficial, a UM presence can be established in a country through visiting faculty and exchange students.

In Year 2, an external partner and project should be identified in a country in the hemisphere with leadership from the Innovation Advisory Board, as suggested in Proposal 5, on this selection.

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## Suggested Timeline



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