



## **Florida Job Growth Grant Fund Workforce Training Grant Proposal**

Proposal Instructions: The Florida Job Growth Grant Fund Proposal (this document) must be completed and signed by an authorized representative of the entity applying for the grant. Please read the proposal carefully as some questions may require a separate narrative to be completed.

### **Entity Information**

Name of Entity: The University of Florida Board of Trustees

Federal Employer Identification Number (if applicable): ██████████

#### Contact Information:

Primary Contact Name: Stephanie Gray

Title: Assistant Vice President, Division of Sponsored Programs

Mailing Address: 207 Grinter Hall

PO Box 115500

University of Florida, Gainesville, FL 32611-5500

Phone Number: 352-392-9267

Email: ufawards@ufl.edu

### **Workforce Training Grant Eligibility**

Pursuant to 288.101, F.S., The Florida Job Growth Grant Fund was created to promote economic opportunity by improving public infrastructure and enhancing workforce training. This includes workforce training grants to support programs offered at state colleges and state technical centers.

Eligible entities must submit proposals that:

- Support programs and associated equipment at state colleges and state technical centers.
- Provide participants with transferable and sustainable workforce skills applicable to more than a single employer.
- Are offered to the public.
- Are based on criteria established by the state colleges and state technical centers.
- Prohibit the exclusion of applicants who are unemployed or underemployed.



## Cover Letter



Jon Dobson, PhD  
J Crayton Pruitt Family Professor of Biomedical Engineering  
UF Research Foundation Professor of Biomedical Engineering & Biomaterials  
Associate Director, Institute for Cell & Tissue Science & Engineering  
J. Crayton Pruitt Family Department of Biomedical Engineering &  
Department of Materials Science & Engineering

PO Box 116131  
Gainesville, FL 32611  
Phone : 352-273-9222  
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**December 19, 2017**

Enterprise Florida  
800 N. Magnolia Ave.  
Suite 1100  
Orlando, Florida 32803

**Re: Florida Job Growth Grant Fund – Workforce Development Proposal**

Dear Committee,

Please accept the attached documents as application materials for the Florida Job Growth Grant Fund Workforce Grant Proposal. The proposal addresses a critical need for training the technical workforce in the area of biomanufacturing and regenerative medicine. This rapidly growing field faces a shortfall in technicians, due in large part to the fact that training on the types of biomanufacturing systems and tissue engineering bioreactors is available almost exclusively to only graduate research students or a select few undergraduates participating in research within university tissue engineering and regenerative medicine laboratories. The Workforce Educational Bioreactor that we propose to develop in a partnership between the University of Florida and Valencia College, will be integrated into biotechnology AS and AA degrees within Florida's community college system. Such a training device, along with the development of specialized curricula to support it, will place Florida at the forefront of workforce development in regenerative medicine and biomanufacturing. We thank you for your consideration.

Kind Regards,

A handwritten signature in black ink, appearing to read 'Jon Dobson', is written over a white background.

Dr. Jon Dobson



## 1. Program Requirements:

Each proposal must include the following information describing how the program satisfies the eligibility requirements listed on page 1.

A. Provide the title and a detailed description of the proposed workforce training.

**TITLE:** *Workforce Educational Bioreactor (WEB) – A New Paradigm for Training the BioManufacturing / Regenerative Medicine Workforce*

This proposal is a joint effort between the University of Florida (UF) Institute for Cell and Tissue Science and Engineering, Valencia College, and the UF Center of Excellence for Regenerative Health, Biotechnology's Education and Training Center that aims to develop low-cost, stand-alone Workforce Educational Bioreactors (WEB) that can be introduced into the laboratory component of biology and biotechnology courses at community and state colleges in the State of Florida. These bioreactors, along with their pre-packaged experiment and assay/analysis kits, will provide students at Florida community and state colleges with the opportunity to learn skills that are critical to training the tissue engineering and regenerative medicine technical workforce – skills that are not currently part of most biology laboratory curricula.

The Workforce Educational Bioreactor (WEB) will form the cornerstone of undergraduate training in tissue engineering and regenerative medicine (TERM), as well as biomanufacturing – particularly at the community college level – when incorporated into AS and AA degrees with a TERM/biomanufacturing focus. Subsequently, the WEB will enable the state of Florida to become a leader in the education of the regenerative medicine and biomanufacturing technical workforce, an industry that is young, global and rapidly expanding.

The UF Institute for Cell and Tissue Science and Engineering (ICTSE) brings together investigators across departments to focus on identifying and solving problems in Regenerative Medicine & Tissue Engineering and to educate and train the next generation of engineers. The UF Center of Excellence for Regenerative Health Biotechnology's Education and Training Center (Biotility) is a state resource that was established in 2003 to expand and improve workforce talent for Florida's bioscience industry. Efforts are directed to three key areas; 1) Direct industry training and certificate short-courses; 2) Secondary and postsecondary program development and support, including teacher training and certification; and 3) Development and administration of the industry-recognized Biotechnician Assistant Credentialing Exam (BACE) within Florida and nationally. With this foundation, Biotility's vision is to enhance Florida's competitive ability to attract and grow a world class biotechnology industry; building on the availability of responsive and relevant education and training programs to provide a multi-tiered source of employees.



Valencia College (VC) is a public, open access, federally designated Hispanic Serving Institution (HSI), community college that serves over 60,000 students annually. The Valencia service district spans over 4,341 square miles with approximately two million residents within Orange and Osceola Counties in Central Florida. Valencia offers the Associate in Arts degree (A.A.), articulated and non-articulated A.A. pre-majors, transfer plans, and Associate in Science (A.S.) degrees. VC offers the Biotechnology A.S. degree program that was specifically designed in collaboration with industry partners to address the urgent technical training and employment needs of Central Florida's biotechnology research facilities and hospitals.

The partners will develop the capacity for manufacturing stand-alone bioreactors for training the future regenerative medicine / biomanufacturing workforce in techniques such as cell storage and transport, cell handling, sterile techniques, tissue construct assay/evaluation and monitoring.

The US is a global leader for developing cell manufacturing technologies, and the large-scale manufacturing and commercialization of engineered tissues and tissue-related technologies is on the horizon, evidenced by such initiatives as the Department of Defense funded Manufacturing Innovation Institute (MII) within the Manufacturing USA Network: Advanced Regenerative Manufacturing Institute (ARMI)/BioFabUSA. The Alliance for Regenerative Medicine estimated more than 775 companies engaged in TERM related work nationally, and this industry is growing as demands intensify for innovative and lower costing cell-based medical treatments. As discussed in the report *Achieving Large-Scale, Cost-Effective, Reproducible Manufacturing of High-Quality Cells: A Technology Roadmap to 2025 (Roadmap to 2025)*, the cell manufacturing community, and specifically cell and product manufacturers, seek to build a workforce that can sustain long-term industry growth, which includes skilled technicians. The UF ICTSE is at the epicenter of this growth through involvement with ARMI/BioFabUSA, which has charged the university to lead efforts to grow biofabrication in the Southeastern United States.

In a recent survey conducted by the Gainesville Chamber of Commerce, data showed that local manufacturers plan to spend almost \$300 million to expand their efforts over the next three years. New workers will be needed to fill a variety of job postings including Administrative, Quality & Safety Coordinators, Scientific/Technical, Engineers, Drafting & Design Personnel, Technical Support Skilled Production Labor, Technicians, and unskilled laborers. Alachua County alone employs two-thirds of the regional workforce of over 4,000 employees ranging from skilled to graduate level trained employees. However, 73% of the companies (19 of 26) reported that they were experiencing recruiting problems related to specific employee positions or skill sets.

The training in TERM provided by the WEB complements VC's Biotechnology A.S. degree program, which produces Biological Technicians (19-4021.00) capable of working across a variety of industries including research and development, health care, and manufacturing. In Florida Workforce Region 12, where VC is located, biological technicians will experience a growth rate of 9.9% over eight years. This is significant

because VC offers the only A.S. degree program in biotechnology in Workforce Region 12 that directly addresses the regional skills gap (EMSI Data, 2017). In Region 12, there are 11 average monthly postings for Biological Technicians, but 19 average monthly hires indicating the high demand for these positions. Across Florida, there is an anticipated 13.2% growth in the occupation by 2024. The *Roadmap to 2025* report indicates that as the field of cell manufacturing seeks to grow, it is challenged by inadequate cell manufacturing education programs that support productivity, efficiency, reduce workforce errors, and improve consistency and quality of manufactured cells and cell-based medical products. As the field of biotechnology advances, workforce needs are changing and the proposed project leverages the existing training provided through VC's Biotechnology A.S. degree program. This project will provide hands-on training experiences with configurable tissue kits through the WEBs that can support the growth of the TERM workforce, with the pilot testing and foundation beginning at VC before replicating this training across the state.

The project will be milestone driven, incorporating the tasks outlined below.

Milestone 1: DESIGN, MANUFACTURE, AND TEST PROTOTYPE WEB FOR BONE TISSUE. The following tasks will be completed over the two-year duration of this project under this milestone:

1. Computer Aided Design (CAD) & circuit designs for bone bioreactor and designs for inexpensive bench-top incubator housing. Success criteria: Production of design portfolio.
2. Source and procure materials for prototype WEB & incubator for bone tissue. Success criteria: Identification and procurement of components for prototype WEB.
3. Manufacture of initial prototype WEB for bone tissue and initial flow testing under experimental flow conditions with bone scaffolds. Success criteria: Completed and tested WEB prototype for bone tissue.
4. Manufacture of bench-top incubator housing. Success criteria: Completed incubator for WEB integration.
5. Integration and local site testing (flow, temp. gas): WEB and incubator housing.
6. Adjustment of design specifications based on site testing and iterative feedback. Success criteria: Complete WEB systems ready for experimental/educational validation.

Milestone 2: DEVELOP CURRICULUM TO AUGMENT EXISTING *VALENCIA* BIOTECHNOLOGY AS DEGREE. During year 1, VC and Biotility faculty will augment the existing Biotechnology AS degree by developing curricula aligning with the WEB and incorporating this into the current Protein Technology and Tissue Culture (PT&TC) course (BSC2423C) aimed at supporting the tissue engineering technology described in Milestone 1. The following tasks will be completed under this milestone:

1. Identification and sourcing of equipment and consumables needed to set up a WEB tissue-engineering in the VC Biotechnology Laboratory. Success criteria:

- Identification and procurement of all components necessary to implement tissue-engineering curriculum.
2. Development of WEB tissue-engineering curriculum that can be incorporated into the current PT&TC course. Success criteria: Experimental protocols and lesson plans ready for evaluation.
  3. VC will institute a new tissue engineering curriculum component within the existing Biotechnology AS degree. Success criteria: Valencia will provide Workforce Region 12, and eventually the state of Florida, with a highly skilled workforce and establish a mutually beneficial relationship between educators and industry partners.

Milestone 3: DEVELOP EXPERIMENT KIT AND PROTOCOLS, INLINE ASSAYS, LESSON PLANS, AND LEARNING OBJECTIVES. Year 2 of the project will focus on the development of the consumable materials kit that will be replenished at the start of each project. The actual experimental protocols and lesson plans will be developed and stress tested in educational laboratories at VC and the UF campus. In addition, VC will begin offering coursework and credentialing in partnership with Biotility. The following tasks will be completed under this milestone:

1. Development of lesson/experiment plan & learning objectives. Success criteria: Experimental protocols and lesson plans ready for evaluation.
  2. Identification and sourcing of experiment “kit” components: Cells, media, growth factors, scaffold materials, tissue assay components. Success criteria: Identification and procurement of all components necessary to implement the lesson plan.
  3. Stress test lesson plan and run WEB experiments / analyses – make any necessary modifications to the WEB and lesson plan based on test results. Success criteria: Complete and test WEB with laboratory protocols ready for implementation in a community college or undergraduate university class.
  4. Offer students coursework in Core Concepts in Biomanufacturing and Quality Systems, and provide the opportunity to credential students through the Biotechnician Assistant Credentialing Exam (BACE) Certification. Success criteria: Industry certificates and certification for students.
  5. Cell, media and growth factor, and bioreactor packaging and shipping strategies. Success criteria: Shipping criteria for cells, experiment kits, and bioreactors.
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**B. Describe how this proposal supports programs at state colleges or state technical centers.**

The project supports the state college’s mission of workforce development by providing training to develop skills needed for emerging workforce needs in biomanufacturing and providing students with workforce credentials. The project supports the regional and statewide goals to increase job growth and economic development by partnering with researchers at the university and workforce development programs at the community college to focus on manufacturing and engineering-driven solutions to real-world clinical problems. In accordance with the mission of Florida State College System, the project is



located in a region of high need for workforce education and offers resources in manufacturing and biotechnology to communities that have limited access to high-quality workforce training.

The proposed technology will incorporate existing biotechnology and biomedical equipment curriculum with new coursework developed to support this advanced technology. While basic biology and physiology courses at both universities and community colleges normally include a laboratory component, the focus of this is generally not on techniques that are specifically relevant to regenerative medicine and biomanufacturing. While some small numbers of students may participate in hands-on tissue engineering experiments as part of an undergraduate research project, very few undergraduate or community college programs offer such opportunities as part of a taught course.

This project will address this gap by designing and manufacturing “training” bioreactors and tissue engineering “kits”. These systems will be stand alone, bench-top bioreactors that can be set up in biology labs at community colleges and universities, and will be capable of being integrated into the laboratory component of the taught curriculum. Such systems will provide future graduates skills that are critical to the regenerative medicine / biomanufacturing industry, such as cell storage and handling, sterile techniques, an understanding of tissue scaffold design, and hands-on experience of monitoring and evaluating the engineering tissues. Specifically, this will focus on Florida’s AS/AA students and, eventually, high school graduates wanting technical training required for entry-level technician and supervisory jobs in this high-tech industry.

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C. Describe how this proposal provides participants transferable, sustainable workforce skills applicable to more than a single employer.

The WEB system will be incorporated into Florida’s community college programs designed around technical degrees for the biomanufacturing and regenerative medicine workforce. There is currently a rapidly growing need for technicians and entry-level supervisors in this field; however, the expensive infrastructure needed for tissue engineering (e.g. bioreactors, biosafety labs, cell storage facilities, cell culture hoods, and incubators) has presented a significant barrier to incorporating this training into community college programs. We are proposing to design and manufacture a bench-top educational bioreactor that can be deployed in standard community college biology labs - without the need for additional infrastructure - that will provide training in the skills that the regenerative medicine and biomanufacturing industry require, such as cell handling, sterile techniques, tissue assays, etc. Industry will gain a workforce capable of filling complex technical and supervisory positions. Furthermore, local industry benefits from the opportunity for training/retraining current employees for advancement. Additionally, students will gain an affordable education that provides them an opportunity to enter the workforce directly after graduation, putting Florida at the forefront of workforce development in this rapidly emerging field.

Biomanufacturing (tissue engineering / regenerative medicine) is an emerging global industry with a rapidly growing, unmet need for a workforce with technical degrees at all levels, as highlighted in the Department of Defense-funded Advanced Regenerative Manufacturing Institute’s report, National Cell Manufacturing Technology Roadmap to 2025:

*“Beyond managing the technical aspects of cell processing, storage, and quality control, the cell manufacturing community must also build a workforce and establish standards and regulations that can sustain long-term industry growth. An effective workforce needs to be capable of not only operating, but continuously improving next-generation cell manufacturing technologies and their associated techniques.”* (Figure 1).



**Figure 1:** Excerpt from Roadmap Strategy (2).

The project supports meeting the emerging skills and training needs of the future regenerative manufacturing workforce. The project will also provide workforce training that is transferable and nationally recognized via the Biotechnician Assistant Credentialing Exam (BACE) certification. The BACE is an industry-recognized exam designed to assess core skills and knowledge sets identified by industry, and represented within the academic and performance standards of Florida’s secondary Biotechnology program. The test has been vetted by the state’s industry organization BioFlorida, representing more than 3,000 companies and research organizations in the biotechnology, pharmaceuticals, medical devices and bioagriculture sectors. The BACE supports participants pursuing careers as Biological Technicians. This is a valuable certification to industry that documents the mastery of knowledge and skill sets that is essential for new-hires. An entry level worker in Florida can expect to earn \$26,938 annually or \$12.95 per hour, although BACE credential earners have experienced a higher hourly rate of pay of \$15.00 per hour in entry level positions. Experienced Biological Technicians in Florida typically earn a median salary of \$38,252 or \$18.39 per hour. This certification can accelerate graduates earning potential in a growing field with robust opportunity. Nationally, employment of Biological Technicians is anticipated to grow 5% over the next ten years, due to greater demand for biotechnology research for scientific advancements (Department of Labor, 2015). Labor market analysis for the VC service area (Orange and Osceola counties) indicates 9.7% growth over the next eight years in the Biological Technician (19-4021.00) occupation. In 2016, 598 new positions opened, which is 29% above the national average (EMSI Data, 2017). Coupled with the training to develop skills in biomanufacturing, graduates of VC’s Biotechnology A.S. degree program will possess a variety of capabilities and knowledge to meet demands across industry. This project supports the replication of the proposed training plan across



Florida’s community colleges, creating opportunities for students statewide and positioning Florida as a leader in an emerging industry.

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D. Does this proposal support a program(s) that is offered to the public?

YES

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E. Describe how this proposal is based on criteria established by the state colleges and state technical centers.

This project supports a workforce educational program that is driven by industry advisory councils and recommended by regional stakeholders. The VC Biotechnology Program Advisory Council consists of industry partners, professional organizations, government agencies, and educational partners who assist with long-range planning, reviewing curriculum, and providing insight into local employment needs. This Council intentionally designed the academic course pathway to support student learning outcomes linked to workforce competencies. VC’s Biotechnology program is an Associate degree level educational option for students to develop skills for high demand jobs in Central Florida. This program trains students for jobs as Biological Technicians, including roles as cell-culture technicians, research assistants, biomanufacturing assistants, DNA fingerprint technicians, and laboratory technicians. The program serves a diverse student population that is reflective of Valencia’s nontraditional, majority minority enrollment.

	<b>AS - Biotech</b>	<b>Valencia</b>	<b>State Population</b>
<b>Minority</b>	50%	56%	42%
<b>Hispanic</b>	36%	32%	23%
<b>Low Income</b>	35%	40%	17%
<b>First Generation</b>	31%	27%	26%**
**Percent of state population with a bachelor’s degree or higher, not percentage of first generation.			

VC engages in on-going environmental scans for continuous program improvement and development of relevant workforce programming by engaging the regional workforce investment board, CareerSource Central Florida, as well as research, development, and training partners, such as ICTSE and Biotility, to contribute to regional strength and advance the biotechnology workforce.

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F. Does this proposal support a program(s) that will not exclude unemployed or underemployed individuals?

YES

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G. Describe how this proposal will promote economic opportunity by enhancing workforce training. Please include the number of jobs anticipated to be created from the proposed training. Further, please include the economic impact on the community, region, or state and the associated metrics used to measure the success of the proposed training.



The proposed project meets Florida's Workforce Region 12 and the state of Florida industry needs by providing a skilled workforce and establishing a mutually beneficial relationship between educators and industry partners. The Florida Department of Economic Opportunity estimated that 616 new jobs will be created statewide between 2014 and 2022 in engineering/manufacturing related fields at the technician level. This represents an annual 32% job growth or an estimated 198 new jobs each year, making this one of the fastest growing industries the state. In addition, according to the Regional and Statewide Demand Occupations Lists, the First-Line Supervisor of Production and Operating Workers occupation is predicted to have 537 annual openings, which translates to a 0.56% annual growth rate. Labor market analysis for the VC service area (Orange and Osceola counties) indicates 9.7% growth over the next eight years in the Biological Technician (19-4021.00) occupation. In 2016, 598 new positions opened, which is 29% above the national average (EMSI Data, 2017). The project will support regional efforts and provide Central Florida with quality jobs and economic growth by meeting emerging industry needs for skilled biomanufacturing technicians.

The Florida Statewide University System (SUS) produces a qualified advanced degree workforce but there is still a shortage of skilled technicians capable of filling entry-level positions. Industry is looking to the Florida College System (FCS) or two year colleges to provide rigorous degrees that teach relevant technical knowledge and skills needed to prepare for careers in the manufacturing career cluster.

The WEB system will be incorporated into community college programs to train the technical biomanufacturing workforce. In the long term, the WEB system will be used to engage Florida high school students in this field, encouraging them to pursue STEM studies with demonstrations of the technology at high schools and science fairs throughout the state. The systems will be commercialized through the UF partner company, 42Bio, creating well paid, biotechnology design and manufacturing jobs as the deployment of these systems expands.

## 2. Additional Information:

A. Is this an expansion of an existing program?  Yes  No

If yes, please provide an explanation for how the funds from this grant will be used to enhance the existing program.

The proposed enhancements (equipment and curriculum development) to the existing Biotechnology AS degree adds specializations and entry/exit points in the form of certificates to make it especially responsive to the needs of employers and students. State manufactures specialize in production of medical devices such as implants, and biomedical monitoring equipment. Therefore, this proposal provides students the options to enter the workforce as quality control, electronics, or biomanufacturing technicians.

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B. Does the proposal align with Florida's Targeted Industries?

Yes  No

If yes, please indicate the targeted industries with which the proposal aligns.

If no, with which industries does the proposal align?

Biotechnology and Medical Devices

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C. Does the proposal align with an occupation(s) on the Statewide Demand Occupations List and/or the Regional Demand Occupation List?

Yes  No

If yes, please indicate the occupation(s) with which the proposal aligns.

If no, with which occupation does the proposal align?

51-1011 First-line Supervisors of Production and Operating Workers

19-4021.00 Biological Technician

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D. Indicate how the training will be delivered (e.g., classroom-based, computer-based, other).

If in-person, identify the location(s) (e.g. city, campus, etc.) where the training will be available.

If computer-based, identify the targeted location(s) (e.g. city, county, statewide) where the training will be available.

Laboratory-Classroom-based; Valencia College. Once the development is completed, the systems and lesson plans will be rolled out state-wide.

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E. Indicate the number of anticipated enrolled students and completers.

VC will enroll 15 students per cohort. Time to completion will depend on the level of preparation when the student enters the cohort. The project anticipates at least 25 completers.

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F. Indicate the length of program (e.g. quarters, semesters, weeks, etc.), including anticipated beginning and ending dates.

Begin Date: Fall, 2018

End Date: Spring, 2020

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G. Describe the plan to support the sustainability of the proposal.

ICTSE, Biotility, and VC are committed to the sustainability of this important project. ICTSE will support the development of cutting-edge bioreactors to train VC students, and Biotility will support curriculum development that will focus on product process development, biomanufacturing processes, analytical methods, quality systems, and regulatory compliance. These partners will build a foundation for expansion and replication of the WEBs, and the continued growth and development of VC's Biotechnology A.S. degree program. Based on employer demand and identified need, the sustainability of the new skills *training in tissue engineering and regenerative medicine* within the AS Biotechnology degree program is assured and supported by the College. The project has the full support of VC leadership as evidenced by the attached letter of support. Course maintenance and updating is a routine process under VC's existing program review process, which includes ongoing input received from the Biotechnology degree program's industry advisory committee that holds at least two meetings per year. The WEBs will be sustained within the department. VC commits to continuing to use, improve and disseminate curricula and instructional materials developed through this project. Annual meetings held with secondary school guidance counselors and transition coaches inform and disseminate career and program information to strengthen and continue pipeline development.

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H. Identify any certifications, degrees, etc. that will result from the completion of the program. Please include the Classification of Instructional Programs (CIP) code if applicable.

Currently, Valencia offers a Biotechnology AS degree (CIP 1341010100) in conjunction with the Biotechnology Laboratory Specialist (CIP 0341010101) for 30 credit hours. As part of this proposal VC will add Certifications through Biotility including the BACE to the program.

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I. Does this project have a local match amount?

Yes       No

If yes, please describe the entity providing the match and amount.

42Bio, LLC (Gainesville, FL) will provide bioreactor components to a value of \$10,000 and will act as a partner working towards the manufacturing and commercialization of the WEB and it's distribution to Florida colleges and schools. (See attached letter of support).

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J. Provide any additional information or attachments to be considered for the proposal.

SEE BELOW



**Letter of support from 42Bio, LLC:**



*The answer to life, the universe & everything...*

Dr. Blanka Sharm  
Co-Founder  
42Bio, LLC  
42biollc@gmail.com

***December 17, 2017***

Enterprise Florida  
800 N. Magnolia Ave.  
Suite 1100  
Orlando, Florida 32803

***Re: Letter of support***

To Whom It May Concern:

42Bio is happy to commit our enthusiastic support for the attached proposal to develop a workforce educational bioreactor (WEB). In our opinion, the proposed systems are crucial to the development of a technically competent and well prepared regenerative medicine and biomanufacturing workforce. There is a critical need for such a workforce and the WEB is a key piece of technology for community college technical degree programs. As such, 42Bio will commit to supplying \$10,000 worth of bioreactor components to be used in the design phase of the WEB systems. In addition, 42Bio will work as a commercial partner to ensure continued expansion of the WEB technology into community colleges throughout the State of Florida, making Florida a leader in biomanufacturing and regenerative medicine technical education. If you require any further information, please do not hesitate to contact us.

Kind Regards,

A handwritten signature in black ink, appearing to be 'Blanka Sharma', written in a cursive style.

Dr. Blanka Sharma  
Co-Founder  
42Bio, LLC



**Letter of support from Valencia College:**

**VALENCIA COLLEGE**

December 19, 2017

Governor Rick Scott  
Florida Department of Economic Opportunity  
107 E. Madison St.  
Tallahassee, FL 32399  
Re: Florida Job Growth Grant Fund

Dear Governor Scott:

I am pleased to provide this letter of support for the partnership application from the University of Florida and Valencia College to the Florida Job Growth Grant Fund. This project will develop low-cost, stand-alone Workforce Educational Bioreactors (WEB) that can be introduced into the laboratory component of biology and biotechnology courses at community colleges across Florida. I am very supportive of Valencia College’s role as the research and development partner for the WEB, which has the potential to replicate across Florida community colleges providing students opportunities to learn skills that are critical for the emerging tissue engineering and regenerative medicine technical workforce. These skills are not currently part of most biology laboratory curricula, and will provide training on techniques such as cell storage and transport, cell handling, sterile techniques, tissue construct assay/evaluation and monitoring. This project will support Florida to become a leader in the education of the regenerative medicine technical workforce, an industry that is young, global, and rapidly expanding. The practical, large-scale manufacturing of engineered tissues and related activities benefits current industries and has the potential to grow new ones.

Valencia College agrees to partner with the University of Florida on the scope of work outlined in the proposal, *Workforce Educational Bioreactor (Web) – A New Paradigm For Training The Regenerative Medicine Workforce*. The College agrees to perform the scope of work for the subaward amount requested of \$175,265.00.

As President of Valencia College, I support Dr. Susan Ingersoll, the faculty chair for Valencia’s biotechnology degree program and lead for this project, and her partnership with researchers and professors at the University of Florida in their efforts to provide educational pathways and training that meets occupational demands for an emerging, high skilled bio-engineering workforce. I am committed to the success of this project and believe the WEBs will have a strong, positive influence in increasing the pipeline of skilled workers needed to enter and succeed in careers in this growing field.

Thank you for your consideration of this worthy project.

Sincerely,

Dr. Sanford Shugart  
President  
Valencia College



**Letter of support from BioFlorida:**



December 19, 2017

Governor Rick Scott  
Florida Department of Economic Opportunity  
107 E. Madison Street  
Tallahassee, FL 32399

re: Florida Job Growth Grant Fund

Dear Governor Scott:

I am writing to you in strong support of the partnership application from the University of Florida and Valencia College to the Florida Job Growth Grant Fund.

BioFlorida is the trade association in the state that supports the growth and advancement of the life sciences industry, representing nearly 6,000 establishments and research organizations in the biopharmaceutical, medical technology, health IT and bioagriculture sectors that collectively employ nearly 83,000. The industry in the state has shown strong growth, with faster rates than the nation as whole and achieving double digit growth in the biopharmaceutical, medical technology and research sectors.

This project will help propel this growth; and, by developing a trained technical workforce will help further establish Florida a leader in tissue engineering and regenerative medicine, rapidly expanding areas of research and manufacturing with significant benefit to patients.

If awarded the partners will develop low-cost, stand-alone Workforce Educational Bioreactors (WEB) that can be introduced into the laboratory component of biology and biotechnology courses at community and state colleges in Florida. The WEB, along with pre-packaged experiment and assay/analysis kits, will provide students at Florida community and state colleges with the opportunity to learn skills that are critical to training the emerging tissue engineering and regenerative medicine technical workforce – skills that are not currently part of most biology laboratory curricula.

BioFlorida is committed to the success of this project and will support the communication of the program and the availability of the skilled workforce across the state for research institutions, universities and companies involved in tissue engineering and regenerative medicine to utilize and benefit.

Thank you for your consideration of this proposal which will result in the advancement of the life sciences in the state.

Sincerely,

A handwritten signature in black ink that reads 'Nancy K. Bryan'. The signature is written in a cursive style.

Nancy K. Bryan  
President & CEO, BioFlorida

## Letter of support from Akron BioTech:



AKRONBIOTECH

November 16, 2017

Governor Rick Scott  
Florida Department of Economic Opportunity  
107 E. Madison St.  
Tallahassee, FL 32399

Re: Florida Job Growth Grant Fund

Dear Governor Scott:

I gladly provide this letter of support for the partnership application from the University of Florida and Valencia College to the Florida Job Growth Grant Fund.

If awarded, the partners will develop low-cost, stand-alone Workforce Educational Bioreactors (WEB) that can be introduced into the laboratory component of biology and biotechnology courses at community and state colleges across Florida. The WEB, alongside pre-packaged experiment and analysis kits, will provide students at Florida community and state colleges with the opportunity to learn skills that are critical to training the emerging tissue engineering and regenerative medicine technical workforce. These skills are not currently part of most biology laboratory curricula, and will provide training on techniques such as cell storage and transport, cell handling, sterile techniques, tissue construct assay/evaluation and monitoring. This project will support Florida to become a leader in the education of the regenerative medicine technical workforce, an industry that is young, global, and rapidly expanding. The practical, large-scale manufacturing of engineered tissues and related activities benefits current industries and has the potential to grow new ones.

Akron Biotech is a Florida-based biomanufacturing company. We manufacture and distribute the raw and ancillary materials necessary for the discovery, development and commercialization of novel cell and gene therapies as well as tissue engineered products. Akron's components and materials are embedded in some of the first FDA-approved biologics. Our customers include premier research institutions and Fortune 100 companies at the forefront of regenerative medicine. Current workforce development efforts fall short of our ongoing (and ever-changing) needs, both in terms of the number of qualified personnel available in the local labor market and in terms of the quality and focus of their training when they join us. Too often, the cost associated with bringing new hires up to speed is borne by the employer.

We believe that the exponential growth in the field of regenerative medicine – which includes cell and gene therapies and tissue engineered products – is an important opportunity for the State, including its world-class research and clinical institutions, its emergent industrial base, and ultimately, its patients and their families. Whether or not the State of Florida is able to increase its role in this emerging industry will depend on whether or not it can produce the qualified men and women the industry requires. The creation of a technical workforce with the skills in cell culture and bioreactor use would help bolster Florida's tissue engineering and advanced biomanufacturing capacity. It would certainly help support new firm formation, continued growth among firms within the state, and could even bolster investment promotion efforts, making the State an increasingly attractive destination for companies based elsewhere looking to bolster their biomanufacturing capacity.



Akron Biotech supports the University of Florida and Valencia College's efforts in providing educational pathways and training that meets occupational demands for an emerging, high skilled bio-engineering workforce. Akron Biotech is committed to the success of this project and believes the WEBs will have a strong, positive influence in increasing the pipeline of skilled workers needed to enter and succeed in careers in this growing field.

Thank you for your consideration of this visionary project.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Claudia Zylberberg'.

Claudia Zylberberg, PhD  
Founder and CEO

**Letter of support from LifeLink Tissue Bank:**

**Michael Consilvio, M.B.A.**  
*Executive Director, General Manager*

**Brad Bassler, M.B.A.**  
*Vice President, Operations*

**Timothy A. Ignatius, B.S.**  
*Vice President, Sales & Marketing*



**Mark Strong, RN, CPTC**  
*Senior Vice President, Associate Executive Director*

**Liz Horn-Brinson, MT, B.S., ASCP**  
*Vice President, Quality Assurance*

**Daniel L. Schultz, M.D.**  
*Medical Director*

*A not-for-profit corporation dedicated to serve patients in need of transplantation therapy.*

December 8, 2017

Governor Rick Scott  
Florida Department of Economic Opportunity  
107 E. Madison St.  
Tallahassee, FL 32399

Re: Florida Job Growth Grant Fund

Dear Governor Scott:

I gladly provide this letter of support for the partnership application from the University of Florida and Valencia College to the Florida Job Growth Grant Fund. If awarded, the partners will develop low-cost, stand-alone Workforce Educational Bioreactors (WEB) that can be introduced into the laboratory component of biology and biotechnology courses at community and state colleges across Florida. The WEB, alongside pre-packaged experiment and analysis kits, will provide students at Florida community and state colleges with the opportunity to learn skills that are critical to training the emerging tissue engineering and regenerative medicine technical workforce. These skills are not currently part of most biology laboratory curricula, and will provide training on techniques such as cell storage and transport, cell handling, sterile techniques, tissue construct assay/evaluation and monitoring. This project will support Florida to become a leader in the education of the regenerative medicine technical workforce, an industry that is young, global, and rapidly expanding. The practical, large-scale manufacturing of engineered tissues and related activities benefits current industries and has the potential to grow new ones.

LifeLink Foundation is a not-for-profit corporation comprised of five divisions including three organ procurement organizations, an immunology laboratory, and a tissue bank. LifeLink tissue bank processes donated human tissue into transplantable allografts, and is actively engaged in a variety of tissue engineering and regenerative medicine Research and Development activities. LifeLink supports the University of Florida and Valencia College's efforts in providing educational pathways and training that meets occupational demands for an emerging, high skilled bio-engineering workforce. LifeLink is committed to the success of this project and believes the WEBs will have a strong influence in increasing the pipeline of skilled workers that are available to support careers in this growing field.

Thank you for your consideration of this visionary project.

Sincerely,



Brad Bassler  
V.P. Operations  
LifeLink Tissue Bank

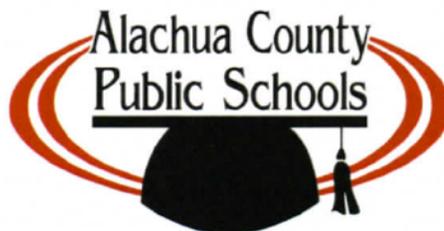
**Letter of support from Alachua County Public Schools:**

**BOARD MEMBERS**

April M. Griffin  
Robert P. Hyatt  
Leannetta McNealy, Ph.D.  
Gunnar F. Paulson, Ed.D.  
Eileen F. Roy

**SUPERINTENDENT**

Karen D. Clarke



*We are committed to the success of every student!*

District Office  
620 East University Avenue  
Gainesville, Florida  
32601-5498

www.sbac.edu  
(352) 955-7300  
Fax (352) 955-6700

November 13, 2017

Dear Sir,

The Institute of Biotechnology in Alachua County is extremely supportive of the *"Workforce Educational Bioreactor (Web) – A New Paradigm For Training The Regenerative Medicine Workforce"* proposal.

The Institute of Biotechnology at Santa Fe High School is one of the first high school biotechnology programs developed in the state of Florida. This is a four-year program where students are exposed to a wide range of biotechnology curriculum which includes making solutions in a laboratory setting, working with DNA, protein isolation, purification and analysis, assays, indicators, spectrophotometry, protein buffer preparation and recombinant protein production.

At the end of the program, students are eligible to take BACE state certification exam. "The Biotechnician Assistant Credentialing Exam (BACE) is an industry-recognized exam designed to assess core skills and knowledge sets identified by industry, and represented within the academic and performance standards of Florida's secondary Biotechnology program. The test has been vetted by the state's industry organization BioFlorida, representing more than 3,000 companies and research organizations in the biotechnology, pharmaceuticals, medical devices and bioagriculture sectors." Our students receive three college credits for passing this exam towards a Biotechnology AAS/AS degree or Biotechnology Laboratory Technology AAS/AS degree through a state-wide articulation agreement.

Santa Fe High School is located in Alachua, Florida, which has a large concentration of Biotechnology industries. Students who complete this program and pass the BACE exam are well qualified to enter the workforce at the entry level. The program has an active Advisory Committee made up of biotechnology companies located in the Alachua area. These companies assure that the equipment and instruction are current and up to date with industry practices.

For a high school students to be involved with this newly proposed curriculum would be an incredible opportunity. It would add additional skills to their resumes and enable them to apply for high skill, high wage jobs throughout the state while providing a pipeline of qualified employees for entry-level jobs. Alachua County Public Schools enthusiastically supports this proposal.

Sincerely,

A handwritten signature in blue ink that reads "Bill McElroy".

Bill McElroy, Director  
Career and Technical Education  
Alachua County Public School



### 3. Program Budget

**Estimated Costs and Sources of Funding:** Include all applicable workforce training costs and other funding sources available to support the proposal.

A. Workforce Training Project Costs:

Equipment	\$		
Personnel	\$	489,606	
Facilities	\$		
Tuition	\$	11,519	
Training Materials	\$	5,000	
Other	\$	512,421	Please Specify: <input type="text"/>
<b>Total Project Costs</b>	<b>\$</b>	<b>1,018,546</b>	

B. Other Workforce Training Project Funding Sources:

City/County	\$		
Private Sources	\$	10,000	
Other (grants, etc.)	\$		Please Specify: <input type="text"/>
<b>Total Other Funding</b>	<b>\$</b>		

**Total Amount Requested**      **\$ 1,008,546**

**Note:** The total amount requested must equal the difference between the workforce training project costs in 3.A. and the other workforce training project funding sources in 3.B.



**BUDGET: UNIVERSITY OF FLORIDA**

PI Name	DOBSON		Sponsor	ENTERPRISE FLORIDA				Totals
Title	WORKFORCE EDUCATIONAL BIOREACTOR							
Dates	04/01/18		Year 1		Year 2			
			04/01/18	03/31/19	04/01/19	03/31/20		
FTE		Months	Type	Salary	Fringe	Salary	Fringe	
1.00	McFetridge	1.50	Calendar	20,345	5,575	20,955	5,742	52,617
1.00	Jon Dobson	1.50	Calendar	25,935	7,106	25,935	7,106	66,082
1.00	Donnelly	0.50	Calendar	4,476	1,226	4,610	1,263	11,575
1.00	PI 4	0.00	Calendar	0	0	0	0	0
1.00	PI 5	0.00	Calendar	0	0	0	0	0
			<b>Totals</b>	<b>50,756</b>	<b>13,907</b>	<b>51,500</b>	<b>14,111</b>	<b>130,274</b>
				<b>64,663</b>		<b>65,611</b>		
FTE		Months	Type					
1.00	Post doc	24.00	Calendar	95,000	9,690	97,850	9,980	268,053
0.50	Grad student	6.00	Calendar	12,500	1,275	12,875	1,313	42,577
	Undergrad	0.00	Calendar	0	0	0	0	0
			<b>Totals</b>	<b>107,500</b>	<b>10,965</b>	<b>110,725</b>	<b>11,293</b>	<b>310,630</b>
	Tuition			11,308		11,873		23,181
	Equipment				0		0	
					0		0	
					0		0	
					0		0	
			<b>Totals</b>	<b>0</b>		<b>0</b>		<b>0</b>
	Supplies							
		Materials			70,000		50,000	120,000
		Publication			0		0	0
		Animals			0		0	0
		Consultant			0		0	0
		Other*			0		0	0
			<b>Totals</b>		<b>70,000</b>		<b>50,000</b>	<b>120,000</b>
	Travel							
		Domestic			2,000		2,000	4,000
		Foreign			0		0	0
			<b>Totals</b>		<b>2,000</b>		<b>2,000</b>	<b>4,000</b>
	Subcontract A							0
	Subcontract B							0
			<b>Totals</b>		<b>0</b>		<b>0</b>	<b>0</b>
	Total Direct Cost				266,436		251,502	517,938
	MTDC				255,128		239,629	494,757
	IDC				133,942		125,805	259,747
			<b>TOTAL</b>		<b>400,378</b>		<b>377,307</b>	<b>777,685</b>



**BUDGET: VALENCIA COLLEGE**

<b>Project: Florida Job Growth</b>				
<b>Funder: Florida Department of Economic Opportunity, subaward from University of Florida</b>				
<b>Projected Submission date: 12/1/17</b>				
<b>Project Period: 4/1/18 - 3/31/20</b>				
<b>Is this proposal being submitted through the Valencia Foundation? No</b>				
<b>PERSONNEL</b>	<b>GL</b>	<b>YEAR 1</b>	<b>YEAR 2</b>	<b>Total</b>
Lab Assistant II - Pay Grade 1618 - Full Time, budgeted at first quartile. To be hired during grant period; not sustained. Provides 1-1 tutoring for students in laboratory setting; preps experiments; assists students to prepare for BASE credential assessment; facilitates student learning of concepts used with WEBS.	530/540	\$29,197.00	\$30,073.00	\$59,270.00
<b>Total Personnel</b>		<b>\$29,197.00</b>	<b>\$30,073.00</b>	<b>\$59,270.00</b>
<b>FRINGE BENEFITS (include p/t in all benefits except ins.)</b>				
FICA 6.2%; FICA Medicare 1.45% = 7.65%	591	\$2,234.00	\$2,301.00	\$4,535.00
Retirement 7.92% (increases by 3% annually)	592	\$2,382.00	\$2,527.00	\$4,909.00
Health/Dental/Life Insurance -increases by 5% annually per Valencia College procedures. Per Diane Fahr on 11/30/17, Year 1 is level funding from FY17 projections but Year 2 is the increased amount projected for FY18 .	597	\$7,628.00	\$8,010.00	\$15,638.00
<b>Total Fringe Benefits</b>		<b>\$12,244.00</b>	<b>\$12,838.00</b>	<b>\$25,082.00</b>
<b>Total Personnel and Fringe Benefits</b>		<b>\$41,441.00</b>	<b>\$42,911.00</b>	<b>\$84,352.00</b>
<b>CONSTRUCTION</b>				
None	625/760	\$0.00	\$0.00	\$0.00
<b>Total Construction</b>		<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>
<b>EQUIPMENT - \$5,000+ unit cost</b>				
None	710	\$0.00	\$0.00	\$0.00
<b>Total Equipment</b>		<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>
<b>TRAVEL</b>				
Domestic travel per Valencia College rates of \$0.445 per mile; \$36 per day per diem for meals. Estimate for parking, local transportation (taxi, airport shuttle, etc.), hotel, and airfare. Travel supports site visits and dissemination activities, including project partner meetings in Gainesville at the University of Florida.	605	\$4,000.00	\$4,000.00	\$8,000.00
<b>Total Travel</b>		<b>\$4,000.00</b>	<b>\$4,000.00</b>	<b>\$8,000.00</b>
<b>PARTICIPANT SUPPORT COSTS</b>				
Student Scholarships - Estimated at \$1,000 per student for 15 students per year to support lab fees, BACE credentialing expenses, and tuition.	680	\$15,000.00	\$15,000.00	\$30,000.00
<b>Total Participant Support Costs</b>		<b>\$15,000.00</b>	<b>\$15,000.00</b>	<b>\$30,000.00</b>
<b>OTHER DIRECT COSTS</b>				
Materials and Supplies - consumables to support student lab activities and computer for project staff.	655/665/706	\$2,500.00	\$2,500.00	\$5,000.00
<b>Total Other Direct Costs</b>		<b>\$2,500.00</b>	<b>\$2,500.00</b>	<b>\$5,000.00</b>
<b>Total Direct Costs</b>		<b>\$62,941.00</b>	<b>\$64,411.00</b>	<b>\$127,352.00</b>
<b>INDIRECT COSTS</b>				
Indirect Costs - 56.8% of personnel costs (USDHHS negotiated rate).	429	\$23,539.00	\$24,374.00	\$47,913.00
<b>Total Indirect Costs</b>		<b>\$23,539.00</b>	<b>\$24,374.00</b>	<b>\$47,913.00</b>
<b>Total Direct and Indirect Costs</b>		<b>\$86,480.00</b>	<b>\$88,785.00</b>	<b>\$175,265.00</b>

## BUDGET OVERVIEW

Expense Type	UF	Valencia	Biotility	Total
Personnel	\$ 319,575.00	\$ 59,270.00	\$ 23,073.00	\$ 401,918.00
Fringe	\$ 54,345.00	\$ 25,082.00	\$ 8,261.00	\$ 87,688.00
Total Personnel	\$ 373,920.00	\$ 84,352.00	\$ 31,334.00	\$ 489,606.00
Tuition	\$ 11,519.00	\$ -	\$ -	\$ 11,519.00
Training materials	\$ -	\$ 5,000.00	\$ -	\$ 5,000.00
Materials and Supplies	\$ 120,000.00	\$ -	\$ -	\$ 120,000.00
Travel	\$ 4,000.00	\$ 8,000.00	\$ 1,000.00	\$ 13,000.00
Scholarships	\$ -	\$ 30,000.00	\$ -	\$ 30,000.00
Total Other	\$ 4,000.00	\$ 38,000.00	\$ 1,000.00	\$ -
<b>Direct Total</b>	<b>\$ 509,439.00</b>	<b>\$ 127,352.00</b>	<b>\$ 32,334.00</b>	<b>\$ 669,125.00</b>
<b>Indirect</b>	<b>\$ 274,533.00</b>	<b>\$ 47,913.00</b>	<b>\$ 16,975.00</b>	<b>\$ 339,421.00</b>
<b>TOTAL</b>	<b>\$ 783,972.00</b>	<b>\$ 175,265.00</b>	<b>\$ 49,309.00</b>	<b>\$ 1,008,546.00</b>

- C. Provide a detailed budget narrative, including the timing and steps necessary to obtain the funding, how equipment purchases will be associated with the training program, if applicable, and any other pertinent budget-related information.

### KEY PERSONNEL

**Dr. Jon Dobson, PhD, University of Florida: Principal Investigator / Program Director** – Dr. Dobson graduated with a B.Sc. and M.Sc. in geological Sciences and Geophysics from the University of Florida. He obtained his PhD in Natural Sciences in 1991 from the Swiss Federal Institute of Technology, ETH-Zurich. He did his postdoctoral training in Geophysics and Biophysics at both the ETH-Zurich and The University of Western Australia, before taking a faculty position at Keele University in the United Kingdom. In 2011, he returned to the University of Florida as Professor of Biomaterials and Biomedical Engineering, and founding director of the Institute for Cell and Tissue Science and Engineering (ICTSE) at UF. Dr. Dobson’s research focuses on biomedical applications of magnetic micro- and nanoparticles, the role of brain iron in neurodegenerative diseases, and biomedical device design for tissue engineering and regenerative medicine. He is a Fellow of the *American Association for the Advancement of Science (AAAS)*, the *American Institute for Medical and Biological Engineering (AIMBE)*, *The Royal Society of Biology*, *The Royal Society of Medicine*, and a past *Royal Society of London Wolfson Research Merit Fellow*. In 2002, he was selected for the Wellcome Trust’s *Sir Henry Wellcome Showcase Award*, and in 2008 the UK Medical Research Council’s *César Milstein Award*. He has authored or co-authored more than 190 peer-reviewed publications, including the 2<sup>nd</sup> most highly cited paper in the field, has 20 patents awarded or pending, and is co-founder of three spin-off companies. He is one of the 25 most highly cited researchers world-wide in the field of regenerative medicine.



**Dr. Peter McFetridge, PhD, University of Florida: Co-Principal Investigator** – With an undergraduate degree in biological sciences and a Ph.D. degree in chemical engineering (vascular tissue engineering) Dr. McFetridge has over 20 years' experience working in area of regenerative medicine and bioreactor development. This multidisciplinary background provides a broad and unique understanding of key concepts across disciplines from the importance (and subtleties) of cell function to fluid and tissue mechanics. This has provided an excellent platform that has furthered our understanding of *ex vivo*-based materials and the biological consequence of tissue processing, scaffold mechanics, bioreactor design/development and knock on effects on cellular remodeling. With 8 years at the University of Oklahoma as a research professor and onto tenure-track Dr. McFetridge moved to the University of Florida where these concepts were further developed in a range of research to further the understanding of tissue and organ regeneration through to a focus on design principles that ensures clinical and educational relevance. Dr. McFetridge was awarded the UF International Educator of the Year, UF COE (2011), American Heart Association (AHA) Young Investigator Award (2006) and the OU Innovator of the Year Award in 2007. He has obtained significant funding from the NIH and other federal sources to develop novel regenerative medicine technologies with over \$3 million in research funding. Dr. McFetridge has published 47 peer reviewed research papers, the co-founder of 2 start-up companies and holds numerous patents and patent applications with the University of Florida.

**Dr. Susan Ingersol, PhD, Valencia College: Co-Principal Investigator** – Susan Ingersoll received her B.S. degree in Zoology from University of Florida in 1994 and then continued at the University of Florida, College of Medicine where she earned her Ph.D. Molecular and Mammalian Genetics in 2000. She was a research scientist at Florida Hospital for 13 years where her research focused on blood-borne cancer metastasis and immune cell therapy for ovarian cancer. She has expertise in the area of mammalian cell culture, molecular biology, genetics, cell biology and both in-vitro and in-vivo models of disease. Susan joined Valencia in 2014 and was named Program Director and Professor for the Biotechnology Laboratory Sciences program in 2016. During her career she has published 20 peer reviewed manuscripts, regularly presented her research at national and international meetings, and has served as Principal Investigator for extramural funding.

**Tamara Mandell, M.Ed., Biotility, Co-Investigator** – Tamara Mandell is the Associate Director for the Education and Training Programs at the University of Florida's Center of Excellence for Regenerative Health Biotechnology (Biotility). She received her BSE in Biology from the University of Kansas, and her M.Ed. in Curriculum and Instruction, with a focus on Biotechnology education and training, from the University of Florida. She has over twelve years of combined academic research and industrial biotechnology experience, primarily in the fields of molecular biology, biochemistry, and gene therapy, and thirteen years of experience in the development and delivery of industrial biotechnology-based training. Tamara is fluent in the techniques and applications of both academic research and applied science, including tissue culture growth and expansion,



protein purification, assay development and validation, and regulatory compliance with respect to the manufacture and testing of regulated products.

### **OTHER PERSONNEL**

**Dr. Kevin Jones, PhD, University of Florida: Co-Investigator** – Dr. Kevin S. Jones is a distinguished professor in the department of Materials Science and Engineering. He got his BS in MSE at UF and then did his MS and PhD at Berkeley in MSE. He has spent the past 30 years as a professor studying electronic materials. He has published over 400 articles, most focusing on defects that arise during the processing of semiconductors for microelectronics including laptops and cellphones. He is chairman of the International Committee on Ion Implantation Technology and co-director of SWAMP Center. He has graduated 40 PhD students and has won many awards including the 1990 Presidential Young Investigator award from NSF and several teacher of the year awards. He was Chair of the Department from 2002 to 2010 and helped the department achieve its highest ranking of 6<sup>th</sup> in the country.

**Dr. W Greg Sawyer, PhD, University of Florida: Co- Investigator** – Dr. Sawyer received his PhD in Mechanical and Aerospace Engineering from Rensselaer Polytechnic Institute in 1999. He is currently leading the Soft Matter Engineering Center at the University of Florida, developing of manufacturing and engineering technologies for tissue engineering and biomedicine. Faculty are integrated across the college of Medicine, Engineering, and Science. As a practicing engineer, Dr. Sawyer was a member of the 1993 NASA Mars Rover Program at the Jet Propulsion Laboratory in Pasadena California, and is a Fellow of the National Academy of Innovators (NAI), the Society of Tribologists and Lubrication Engineers (STLE), and was featured in a pentagon display for excellence in DoD research. His laboratory at UF performed remote Experiments for the Air Force on the International Space Station: STS 129 (launch) - STS 134 (return). Dr. Sawyer has over 20 patents in the areas of Materials, BioMedicine, and Medical Devices, 150+ journal publications; 7500+ citations. In the area of education, Professor Sawyer is a member of the Academy of Distinguished Teaching Scholars at the University of Florida, and has developed educational platforms for computational chemistry (Atoms in Motion – 100,000 users), and was a speaker at TED (TED8 1998) on Discovery Based Learning.

### **Personnel Funding:**

UF: Funding is requested so support two postdoctoral researcher engineers (1.0 FTE each) and one doctoral student (0.5 FTE) to work on the development planned as outlined in the above milestones. They will be supervised by Drs. Dobson and McFetridge (funding requested at 1.5 months per year each). Dr. Jones (Materials Science & Engineering @ UF) and Dr. Sawyer (Mechanical and Aerospace Engineering @ UF) (0.25 months per year each) will provide addition input on materials and biomechanical aspects of the bioreactor design. Dr. Donnelly (UF) (0.5 months per year) will co-supervise the postdocs, focusing on the linking of engineering design and learning plan development.



**Biotility:** Funding is requested to support two developers, Ms. Mandell, Assoc. Director of Education and Training and Dr. Houda Pruitt, Senior Training Specialist (1 calendar month each), to develop, write, and beta-test the industry-specific documentation to be integrated into the WEB curricula.

**VC:** Funding is requested for a Laboratory Assistant to provide 1-1 tutoring for students in laboratory setting; preps experiments; assists students to prepare for BASE credential assessment; facilitates student learning of concepts used with WEBs.

### **TUITION / SCHOLARSHIPS**

Funding is requested for tuition assistance for on UF PhD student (0.5 FTE) and scholarship funding is requested for VC Biotechnology students to defray the costs of workforce educational training needs (tuition, laboratory fees, and credentialing exams).

### **MATERIALS / OTHER**

We are also requesting \$120,000 in materials and consumables for (i) bioreactor components, (ii) two bench-top incubators that will be modified to house the bioreactors, (iii) cells, cell culture media, growth factor supplements, scaffold materials, etc. for cell and tissue culture, (iv) a computer and software license for the design software, (v) materials for student lab activities and other materials to support the implementation of project activities. All purchases will be made through UF and Valencia-approved suppliers through the respective institutions' normal purchasing procedures. The bulk of materials purchases for bioreactor construction will be made in Year 1, however, addition components and consumable materials will be made in Year 2 as well.

### **TRAVEL**

Funds are requested for travel or site visits between UF ICTSE, Biotility, VC as well as expenses for project leads to attend an appropriate national scientific meeting in the field of regenerative medicine and biomanufacturing.

### **MATCHING SUPPORT**

In-kind matching support (\$10,000 worth of bioreactor components) is provided by 42Bio, LLC (Gainesville, Florida).

### **INDIRECT COSTS**

Indirect cost rates (IDC) are based on those negotiated and determined by the Department of Health and Human Services. UF currently has an approved IDC rate of 52.5% of Modified Total Direct Costs (MTDC) for on-campus organized research. VC has an approved IDC rate of 56.8% of total personnel costs.



#### 4. Approvals and Authority

- A. If entity is awarded grant funds based on this proposal, what approvals must be obtained before it can execute a grant agreement with the Florida Department of Economic Opportunity (e.g., approval of a board, commission or council)?

*Not Applicable*

---

- B. If approval of a board, commission, council or other group is needed prior to execution of an agreement between the entity and the Florida Department of Economic Opportunity:

- i. Provide the schedule of upcoming meetings for the group for a period of at least six months.

*Not Applicable*

- ii. State whether that group can hold special meetings, and if so, upon how many days' notice.

*Not Applicable*

---

- C. Attach evidence that the undersigned has all the necessary authority to execute this proposal on behalf of the entity. This evidence may take a variety of forms, including but not limited to: a delegation of authority, citation to relevant laws or codes, policy documents, etc.

I, the undersigned, do hereby certify that I have express authority to sign this proposal on behalf of the above-described entity.

Name of Entity: University of Florida Board of Trustees

Name and Title of Authorized Representative: Amber Hardie, Sponsored Programs Admin

Representative Signature: 

Signature Date: 12/20/2017



Office of the Vice President for Research

223 Grinter Hall  
PO Box 115500  
Gainesville, Florida 32611-5500  
352-392-9271  
352-846-0491 Fax

August 21, 2017

Amber Hardie  
Sponsored Research Administrator  
Division of Sponsored Programs  
University of Florida

Subject: Signature Authority and Proposal Processing

Dear Ms. Hardie,

By this letter I am designating you as an Authorized Organizational Representative (AOR) of the University of Florida for the purposes of signing proposal and proposal related information being submitted to federal or non-federal sponsors.

By signing you are verifying and certifying that commitments made in proposals can be honored, that the information presented in the proposal is accurate, and you are confirming the proposal conforms to federal regulations, agency guidelines, and University policies.

To be clear, this AOR designation is for proposal submissions and does not authorize you to sign award related documents, execute or accept grants, contracts, or other agreements on behalf of the University of Florida.

This designation as a University AOR shall be in effect so long as you continue to be employed by the Division of Sponsored Programs or until the authorization is revoked or superseded, whichever shall occur first.

Sincerely,

A handwritten signature in blue ink that reads 'Stephanie Gray'. The signature is written in a cursive, flowing style.

Stephanie Gray  
Assistant Vice President