

SUNNY LABS TO JOBS

SIMULATION FOR
WORKFORCE EXCELLENCE



A proposal for the NYSUNY 2020
Round IV Challenge Grant

PRESENTED BY THE FOLLOWING SUNY CAMPUSES



SUNY

LABS TO JOBS

SIMULATION FOR WORKFORCE EXCELLENCE

The SUNY Labs to Jobs consortium will provide students and businesses access to the most advanced labs and simulation centers for three major workforce sectors:

- Health, Biomedical Services, and Biosciences
- Advanced Manufacturing
- Agribusiness and Food Processing.

Simulation replicates reality and its value is well established in many industries. The labs are tied to the needs of the state workforce and will educate, reinforce skills, analyze data and test new ideas to provide innovation and proficiency for a healthier and sustainable New York.

The Power of SUNY: 5 Campus Hosts, 4 Levels Of Use At Each Lab

The SUNY Labs to Jobs campuses are SUNY Onondaga, Oswego, Upstate Medical University, ESF and Morrisville. The facilities proposed by each campus will perform on multiple levels.

First and foremost, each lab will allow students a chance to refine and enhance their skills in a simulated environment before taking new skills to the workplace. **Second**, the facilities will support existing and new educational programs that will provide even more relevant workforce preparedness. **Third**, the facilities will allow faculty and business partners the opportunity to perform advanced research or test and incubate business ideas. **Fourth**, use of the labs can be extended to serve as a training facility for further education or credentialing for a variety of fields.

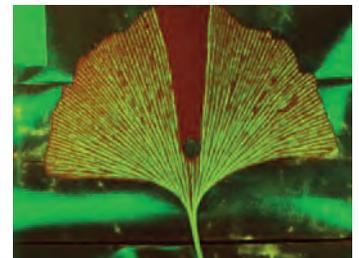
As the facilities will be at different types of campuses, the labs will provide the most advanced simulation environments for a wide range of careers. Simulation is a powerful learning tool and a proven link to mastery of new skills. Labs to Jobs provides opportunities to the entire SUNY pipeline: to those who are new to the workforce; to students seeking highly focused education; to established professionals who need additional, specialized skills. The sophisticated technology — and the ready engagement and expertise of SUNY faculty members — will be a boon, not only to students but to business partners who would otherwise find such resources out of reach.

Simulation Labs and Their Campuses

- Medical Simulation Center (Upstate)
- “Smart Health” Biomedical Health Informatics Research Lab (Oswego)
- Biomedical Instrumentation Lab & Bioinformatics Wireless Network Development (Oswego)
- Food Science and Culinary Lab and Business Simulation Classrooms (OCC)
- Training and Entrepreneurial Labs (OCC)
- Biomimicry Computer and Field Labs (SUNY-ESF)
- Production Sciences/Advanced Manufacturing Lab and Allied Health Lab (Syracuse Educational Opportunity Center/SUNY Morrisville)

Cayuga Community College is also an initial program partner whose students will benefit from the lab sites. The lab site campuses have already identified significant collaborations among the core founding group. Potential for additional campus partners will come from the high degree of applicability to the State University’s Open SUNY and Applied Learning initiatives.

The unique labs will provide the next level of experiential learning for both students and businesses. In using these resources participants can apply best practices and engage in advanced research or data analysis prior to deployment in the field.



Relevance to Business and Economic Growth

SUNY Labs to Jobs will forge and strengthen connections between and among the founding colleges, other SUNY campuses, and the business community of New York State and beyond. Specific industries that would benefit from the facilities include: health information management; medical technologies and instrumentation; advanced manufacturing; food processing and logistics. The expertise of the founding partner campuses provide a focus on health, economic sustainability and quality of life improvements for Central New York.

SUNY Labs to Jobs also will encourage development of small businesses, including local food entrepreneurs and software application developers, as well as provide highly-focused resources for companies who are interested in Start Up New York partnerships. While the campus labs have particular relevancy for the goals of their shared Central New York Regional Economic Development Council, the proposed labs in the consortium also are unique enough — and collaborative enough — to draw SUNY and business partners from across NY.

Unique Lab and Simulation Sites — All United In Purpose

SUNY has a proud history of providing a well prepared workforce for New York State. The addition of these new labs will provide even greater opportunities for exceptional training, research discovery for industry, and support and collaborations for established and emerging businesses.

For example, to meet the needs of the changing healthcare environment, and to supply the highest quality care, all health care providers of the immediate future will need a broader range of bio-medical skills than ever before. The new skill set must include the opportunities to learn — as a team — on the new frontier of health care. Skills we need to teach now range from the application of big data to improvement in population health and quality; to the development of personalized medicine; to the most nuanced skills in direct patient care. The skills labs at Upstate and Oswego will provide this.

For example, some of the most novel new industry breakthroughs have emerged from biomimicry, where items from new paint to new packaging take their cues from nature. ESF's research laboratory will support projects that not only engage faculty, graduate researchers, and undergraduates in real-world problem solving but also will focus on natural resources found in New York State. The project also will establish the Roosevelt Biomimetrics Lab in the Adirondacks.

For example, the workforce training model employed by Onondaga Community College and supported by the Syracuse EOC relies upon job shadowing early in the training process to confirm students' interests and fit for specific job sectors and concludes with intensive field placements to confirm students' mastery of skills and behaviors required for career success. Similarly, OCC's Hospitality and Professional Cooking degree and certificate and the Health Information Technology degree require extended faculty-supervised field placements in partnership with regional businesses. The new labs support these efforts by simulating real world environments.

The collaborating SUNY colleges seek investment to create the lab sites. Each campus has a well thought out proposal for how these facilities advance their education. In addition, the labs offer further value to engage in research, applied learning, and workforce training. United goals include: focus on solving local and global health issues; developing life saving technologies and techniques; and supporting advanced manufacturing, including the production, processing, packaging and distribution of locally produced foods to meet the nutritional needs of a growing world.

In Summary, as an Entity, the SUNY Labs to Jobs Consortium will:

- Build regional capacity to conduct applied research and learning in team-based environments;
- Expand undergraduate research and work-based learning experiences for students;
- Support a "dual-client" workforce development model. This provides students with competency-based training for their careers and employers with a pipeline of highly qualified employees;
- Deliver entrepreneurship training and support to facilitate new product development, market expansion, and process improvements;
- Strengthen educational pathways from non-credit workforce programs to advanced degrees;
- Advance the REDC's neighborhood-based strategy by embedding resources in population centers to link education, training, and entrepreneurship programs to enable movement from low-skilled, to high-skilled, to professional positions to benefit both individuals and regional employers.

Impact: The Power Of Collaboration

The Labs to Jobs simulation sites will provide immediate and long term benefit to the education and employment goals for SUNY students and NYS businesses.

Current SUNY degree students who could benefit (2014-15)
2,303

Current non-traditional learners who could benefit
2,266

New student growth to benefit from lab sites (Over 5 years)
1,666

New non-traditional learners who could benefit (Over 5 years)
3,562

Graduates placed in employment over first five years
5,699

Expert faculty connected to simulation labs
561

New staff to run programs
25

Construction jobs
145

Internships/co-ops (per year)
945

Student clinical placements (per year)
1,140

Revenue generation from labs (Over 5 years)
\$5,220,000

Business start ups/ expansions supported by labs
51

University and industry partners have been identified for each lab. See pages 8-10.

Practical and Ongoing Connection to SUNY's Priority Initiatives: Applied Learning, Open SUNY, START-UP NY

APPLIED LEARNING

Applied learning is a hallmark of SUNY Labs to Jobs, which will contribute to SUNY's objective to add 100,000 new applied learning opportunities within the State University.

Currently each host campus provides experiential opportunities for students, all of which will be enhanced by the simulation labs, including: clinical and co-op placements, internships, civic engagement, research, entrepreneurship and field study. SUNY Labs to Jobs partners will work together to create additional opportunities among the sites to optimize students' learning and build professional networks to support business expansion and career development.

Through simulation, students become participants in their own education to an unparalleled degree. They test real world experiences in a highly sophisticated lab, which allows a competent and confident application of those skills on the job. The labs also provide practical lessons in working as a team.

For example:

- A medical student who intubates a realistic mannequin until the process meets exacting standards will be better equipped to perform this in the real life emergency room.
- A student who learns medical record keeping on real, yet de-identified patient data, will not make an uncorrectable error.
- The student who develops machine operation skills through simulation will be a safer and more efficient operator in the field.
- The student who learns safe food handling and teamwork skills in the lab is an immediate asset to an employer.

OPEN SUNY

While the labs provide intense in-person learning, each Labs to Jobs site supports technologically-rich learning experiences which can be adapted to support online learning and the goals of Open SUNY. SUNY Oswego and OCC are already leaders in Open SUNY+, offering related online programs with OCC's Health Information Technology AAS degree and SUNY Oswego's MBA and Health Services Administration programs. Access to the virtual aspects of the labs of Oswego and Upstate will expand the impact of OCC's Health Information Technology program and extend the online enrollment option to parts of New York State and in other states in the U.S. without similar training opportunities. SUNY Oswego is awaiting approval of its master's in BHI from SUNY and NYSED, after which it will be proposed for Open SUNY as well.

In addition:

- The Health Informatics Research Lab will provide students with access to software and data packages—provided in partnership with SUNY Upstate.
- Projects developed via Oswego's Biomedical Instrumentation Lab and Biomedical Wireless Network bridge have a large virtual component.
- ESF's video conferencing from its unique Adirondack's Lab will bring STEM educational programming to students throughout the state.

START-UP NY

With notable exceptions, such as ESF's Windsor Woods START-UP partnership and Morrisville's partnership with Empire Brewing Company, the CNY region has experienced a slow start in securing START-UP NY partners. The Labs to Jobs host sites will improve this situation by providing more potential matches of the interests of businesses to the SUNY infrastructure.

Plans include:

- Creating neighborhood-based hubs of educational and entrepreneurial activity at downtown Syracuse sites occupied (or to be occupied) by project partners;
- Encouraging development of START-UP NY businesses through co-location of



Serving the entire SUNY student pipeline

A unique aspect of Labs to Jobs is that the proposal benefits the entire spectrum of SUNY learners – from those who have never held a job to those who are seeking advanced skills. Labs to Jobs provides an open door no matter which career path — with sites open to those seeking job and college readiness skills, through professional and advanced degree programs, and on to continuing education and research.



Simulation allows students to engage in applications of core concepts covered in their coursework before entering the workforce.



SUNY Oswego's Richard S. Shineman Center for Science, Engineering & Innovation tackles cutting-edge collaborative research in advanced wireless systems, environmental sustainability, molecular biology and biochemistry, electrical and computer engineering, robotics, and human computer interaction.

OCC's Small Business Development Center at the proposed entrepreneur site;

- Creating new entrepreneurship programs between OCC, the Upstate/ESF CNY Biotech Accelerator and SUNY Oswego's downtown Syracuse Extension campus;
- Leveraging OCC's new workforce development programs and expanded academic programs focused on the food industry with SUNY Oswego's existing project to establish a USDA-approved laboratory on its main campus in partnership with the Port of Oswego Authority and Perdue AgriBusiness;
- Providing industry R&D access to the most current information systems and high-end servers for collecting and analyzing biomedical or biomimicry data;
- Leveraging the connection to the expertise of the existing and successful SUNY Institute for Environmental Health and Environmental Medicine;
- Offering businesses ready access to highly skilled student interns and workplace-ready graduates.

Supporting Access, Completion and Success for SUNY Students

SUNY Labs to Jobs will enhance the quality of existing academic programs and create new educational pathways that will improve student performance in existing workplaces and increase readiness and retention of graduates entering the workforce. The benefit of five distinct campus partners — supporting entry level to post-doctorate education — underscore the benefit of SUNY as the educator that understands, and responds to, the needs of New York State. It should be noted that professional development opportunities for collaborating partners and businesses also will include training for faculty and business leaders in strategies to overcome poverty or disability as barriers to employment.

Onondaga Community College

Onondaga is an open access SUNY institution which serves more than 12,000 students annually. Concurrent enrollment is offered in 25 school districts in the region. OCC will expand its existing Hospitality AAS degree and Professional Cooking Certificate program to focus on entrepreneurship and the local food system, strengthen linkages between non-credit workforce training programs and degree programs, and accommodate existing enrollment demand. Expansion of the Health Information Technology AAS degree program will increase workforce readiness among students and strengthen pathways from two-year to four-year programs. The proposed Cleanroom Simulation Lab will extend OCC's capacity to train students enrolled in electrical, mechanical, and nuclear technology degree programs for work in advanced manufacturing and biomedical settings where precision devices used in global health applications are produced.

OCC's Food Science Lab at the Center for Training and Entrepreneurship (CTE) will support a community integrated, collaborative approach to workforce development that meets the evolving needs of both businesses and individuals. The CTE will offer programs that mirror a business workday schedule and environment; offer ready access by public transportation; and, create a visible resource for residents to engage in high-quality training leading to employment and to receive small business development services. The CTE's methods are based on the well-documented DACUM (Developing A Curriculum) process where students are assessed and monitored for business sector "fit" and curriculum is matched to employer's needs through expert worker task analysis; competency-based curriculum design; and, development of learning goals and measurable standards—all validated by employers. OCC is funded by a grant from the U.S. Department of Labor TAACCCT program to design workforce programs in advanced manufacturing and food processing using this methodology. Labs to Jobs will leverage and expand on this federal investment by investing in needed capital improvements and equipment, thereby building the capacity for sustainable self-funding through direct business investment and competency-based student financial aid.

Syracuse Educational Opportunity Center (Morrisville State College and OCC)

With the emergence of the global marketplace, the advanced manufacturing industry in Central New York has undergone significant changes. To address workforce needs, the advanced manufacturing laboratory on the SUNY Syracuse Educational Opportunity campus will allow prospective students to explore manufacturing careers and to prepare them to meet the academic milestones required to get into an advanced manufacturing degree or certificate program offered by partner SUNY institutions. In addition, the laboratory will offer the certified production technician program, which will lead to a national credential offered by the Manufacturing Skill Standards Council. The program will prepare students with knowledge and understanding of four critical work functions: Safety, Quality Practices and Measures, Production & Processes and Maintenance Awareness. The program will also include a separate unit on Green Production. The specific features and benefits of this program is to increase computer skills, and to develop machine operation skills through computer-based simulations. As part of SUNY Labs to Jobs, the EOC also will update its existing Certified Nurse Aide classroom and clinical lab to include the infrastructure and equipment needed to offer certified home health aide and personal care aide training programs.

SUNY Oswego

SUNY Oswego has nearly 8,000 students and offers 110 programs of study, with a strong online component and a presence in downtown Syracuse as well. As a fully online program, the Biomedical and Health Informatics MS program at SUNY Oswego provides a major contribution to the SUNY Excels commitment to increasing student access to degrees in high needs employment areas. It also will be the culminating point in a degree pipeline from OCC's Health Information Technology AAS to

Oswego's Information Science BA/BHI MS degrees. Graduates of Oswego's Computer Science Department, which houses BHI, have a nearly 100% placement rate in employment or advanced degree programs upon graduation, a testament to the department's success at mentoring and preparing students. Oswego's developments of the Biomedical Wireless capabilities, and full implementation of the biomedical instrumentation lab, coincide with year three of an NSF-funded STEP grant and year 5 of an NSF S-STEM grant supporting the retention and success of students in STEM fields, which includes summer bridge camps in mathematics, peer mentoring programs, and tutoring. These high impact practices will continue upon conclusion of the grants. Data collected show significant impacts in retention rates of students utilizing peer mentoring and tutoring compared to their peers in STEM fields who do not take advantage of these opportunities. The labs will create more early research opportunities, and instruction in them will be supported by the activities funded by the NSF grants. Oswego is also using Starfish to track student success, and hired two Student Academic Success Specialists in full-time positions to advise high-risk students. Tracking STEM students with risk indicators is one of our priorities with the implementation of Starfish for increased student success.

SUNY Upstate Medical University

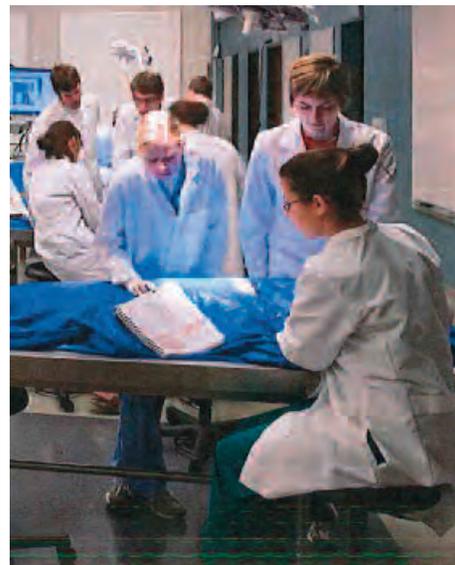
Upstate is the region's largest employer as well as its only academic medical university, consisting of four colleges, its own hospitals and clinical networks and a biomedical research enterprise. On the education front, Upstate has responded to the state's pressing need for doctors and health care providers by expanding its degree programs and overseeing a 35% rise in student enrollment over the past seven years. Of its students, 90% are from New York State.

The proposed biomedical simulation center would incorporate "...arguably the most prominent innovation in [recent] medical education...having the potential to revolutionize health care." (Association of American Medical Colleges 2011). This new and sophisticated learning environment will simulate real-time response to medical emergencies — from the point of first response by emergency medical technicians through emergency department triage and treatment. Team-based patient treatment protocols will be taught, involving a broad range of medical, nursing and allied health students and faculty, including students from LeMoyne College who would utilize this facility as they do Upstate's Clinical Skills teaching lab.

An excellent predictor of whether a doctor will stay to serve New York State is whether he or she attended high school here. SUNY Upstate leads the state in admitting medical students from New York. Upstate's admission policy specifically favors students of demonstrated aptitude and ability who are from New York State, from rural backgrounds, from lower socioeconomic status, and from specific underrepresented minority groups. The mission of the school is to educate healthcare providers for the communities that Upstate serves, and this is emphasized in the students enrolled. Upstate's 2013 graduates number above the national median for African American graduates and those who plan a rural practice. The majority of the graduates from Upstate's Colleges of Medicine, Nursing, and Health Professions stay to serve our communities.

SUNY College of Environmental Science and Forestry

The academic mission of ESF focuses on environmental science, engineering, design, and management, and on creating sustainable alternatives for meeting human needs without depleting natural resources. The Biomimicry Laboratory will provide a visible link between disparate fields of study. ESF is the top ranked environmental college in the country with diverse classes in botany, zoology and field biology. The Biomimicry Laboratory and its three components, The Roosevelt Biomimetics Laboratory in Newcomb, NY, and the Biomimetics Data Center and Imagineering Studio in Syracuse, will link field and laboratory observations on plants and animals to new and more efficient designs, materials, and products variously drawing upon the expertise from these varied fields. ESF's natural history tradition combined with its rich experimental forests in the Adirondacks make the college uniquely capable of a leadership role in this emerging field. Engaging students in the process of creative problem solving enriches class material by showing its connection to the "real world." And the Biomimicry Laboratory will provide a graphic example of trans-disciplinarity in action, that is, bringing the strength of multiple specializations to tackle a complex problem. Located in rural Newcomb New York in Essex County, the Roosevelt Biomimetics Laboratory will engage with local high schools to demonstrate the excitement of STEM fields literally in their back yard. Digital microscopy integrated with video-conferencing will enable us to bring the laboratory into classrooms at the Syracuse campus and, importantly, into high schools distributed across both rural and urban areas of the state to engage students in science as it happens, fostering interest in STEM fields. The integrative potential across disciplines applies as much to faculty as students.



The Medical Simulation Center at Upstate Medical University will provide students with high-fidelity rooms that simulate key patient care sites (such as an ICU or operating room) and the equipment required to develop team skills and appropriate response to urgent or emergent situations. These rooms will be fully equipped to simultaneously transmit and record audio and videotapes of the session, to provide interaction with a "command room" for instruction and guidance, and for real time recording of performance.

Alignment with Regional Economic Development Vision

With a poverty rate of 33.2%, Syracuse is the 23rd-poorest small city in the nation, having suffered from contraction of its traditional manufacturing base since the 1980s that accelerated in the mid-2000s due to the effects of trade adjustment and the Great Recession. The REDC Strategic Plan (2011) and Update (2013) assert that CNY's future economic vitality will depend on the region's ability to stimulate new development and create pathways to living-wage employment for individuals facing situational and entrenched poverty in the City of Syracuse, the region's primary population center and locus for economic activity. SUNY Labs to Jobs will support three priority sectors identified by the REDC : 1) Health, Biomedical Services, and Biosciences; 2) Advanced Manufacturing; and, 3) Agribusiness/Food Processing.

The **Health, Biomedical and Biosciences** sector is one of the largest sectors in the region. Hospitals here employ more than 23,000 individuals. The sector enjoys a 13% higher level of concentration in the region compared with the national average. An additional 3,500 individuals are employed in private, high-tech biomedical companies with average annual wages of nearly \$70,000. The Biomedical sector is projected to grow, and occupations within the sector include competencies and skills that translate to the Agribusiness and Food Industry sector, thereby creating multiple employment pathways for trained and experienced workers.

In addition to supporting the advanced careers of highly trained medical, nursing and allied health specialists and scientists, with high earning power, the project also provides the skills for entry-level occupations. Over the past year (2014-15) there were more than 1,400 job postings for regional positions in this sector that require fewer qualifications than a bachelor's degree, including 95 postings for nursing assistants, 43 for medical assistants, and 39 for Medical Records and Health Information Technicians. Other entry level jobs and hourly wages targeted by this project include: Medical Assistant (\$14), Medical Secretary (\$15), Medical Appliance Technicians (\$16). Central New York postings for positions in this sector requiring a bachelor's or advanced degree numbered included mean wages in the mid \$70s-90s for computer professionals; mid \$80s for physical therapists and mid \$150s and up for doctors.

ESF's Biomimicry Lab directly supports 'Data to Decisions,' a key field identified in the Brookings Center State New York Agenda for Economic Opportunity. Universities and labs as well as D2D firms in the region already offer expertise involved in the processing of massive flows of information. Sectors that have D2D companies were cited as having great potential especially in the region's biosciences sectors. The platform is ripe to establish a biomimicry industry in New York State to take advantage of the projected 1.6 million jobs emerging nationally by 2025.

Although traditional manufacturing has experienced job losses, **Advanced Manufacturing** remains critical to the local economy. The sector represents 10% of the region's total employment and sub-sectors. Employers have strong potential for continued growth and will play a key role in regional plans to increase exports. The sector includes high-skill, high-wage jobs and entry-level jobs that provide middle-income wages and opportunities for continued growth and career advancement. In October, 2014, there were 434 manufacturing jobs going unfilled in Syracuse and neighboring towns. In particular, the Labs to Jobs project will seek to advance medical and environmental health device development, technology transfer, and manufacturing; develop and commercialize bioinformatics-based software and processes; and, expand regional food processing, packaging, and logistics capacity.

Agribusiness and Food Processing is providing a new wave of opportunities for the state. Agricultural commodity sales in New York during 2012 exceeded \$5.4 billion, an increase of more than 22 percent from 2007. NYS is the nation's third largest producer of fluid milk and commodity crops and the nation's top yogurt producer. As Governor Cuomo stated in January, 2014, "Milk production is fueling thousands of jobs across Upstate New York, revitalizing communities and providing a variety of nutritious products for millions of consumers...." CNY is poised to be the Agribusiness and Food Processing hub for the state, and a well-prepared workforce is needed to support it. Employers throughout the region report challenges identifying, recruiting, and retaining skilled personnel. EMSI data show 4,058 jobs in food manufacturing and related wholesale and distribution in CNY for 2014, 11% above the national average. Positions include: chemical technicians, lab technicians, quality assurance, inspectors, testers, packing and filling machine operators, maintenance and repair technicians, stock and material movers, purchasing agents, distribution managers, and chefs. The positions provide numerous points of entry and provide median hourly wages ranging from \$9.78 to \$40.10, which exceed CNY's living wage of \$9.04 for one adult. The jobs provide vertical and lateral career pathways and have a cross-sector application within other sectors, such as Biotechnology. In addition, according to research from the University of Minnesota, businesses project the creation of 54,000 food science jobs nationally over the next several years, and educational institutions are on track to prepare less than half that number of graduates.

Job creation is already occurring in the business sectors targeted by SUNY Labs to Jobs, and the efforts of the collaborators are anticipated to result in appropriate preparation of workers for these positions, leading to further business expansion.

Collaboration: Among Founding Partners, SUNY, Agencies, Industry Sectors, and Businesses

The SUNY partners hosting the Labs to Jobs sites already have plans in place to cross promote their sites for businesses as well as connect students for further opportunities within the SUNY pipeline. The labs also will create an institute-style synergy in bringing new ideas together to reinforce each sector.

For example among the founding Labs to Jobs partners these opportunities have been identified:

- Food packaging advancements (OCC/EOC) could be explored with partners from the Biomimicry Lab (ESF).
- Health Information Technology students (OCC) can use data from the medical simulation center and also shadow medical record and other employees (Upstate).
- New biomedical instrumentation (Oswego) can be tested in a simulated medical environment (Upstate).
- Bioinformatics courses (Oswego) can be tailored for specific health applications (OCC, Upstate).
- Food distribution training (OCC) can occur in partnership with SUNY Oswego's port of Oswego project.
- Nursing students (OCC) and 3+3 PT students (Oswego) can participate in simulation opportunities at Upstate to prepare them for real life intraprofessional team work and the next level of degree work.
- As noted, the SUNY pipeline is supported with access and opportunities at every level of learning — from skills training for first job entry to post-doctoral education. Current articulation agreements among partners will be examined to find further connections to benefit students.
- Cross pollination of skills and best practices among partners. For example, quality control and process standards relates to all simulation labs.
- Collaboration developed by the founding partners has the potential to be scaled for SUNY-wide access or business applications.

Potential use of SUNY Labs to Jobs sites by regional businesses and employers

The simulation labs also will offer an open door to develop useful applications for businesses, especially among the identified sectors. Below are descriptions of the facility and potential use by business.

- OCC's Food Science labs and Center for Training and Entrepreneurship will leverage existing federal funding in workforce development, and will enable improvements in equipment to ensure stronger learning outcomes and workforce readiness for today's technologically-driven food processing and business environments.

Potential business application: Any restaurateur, micro brewer, or entrepreneur bringing new food products to market could use this facility to test products or processes for product stability, to learn the business strategies, and develop "value added" products.

- The proposed Advanced Manufacturing and Cleanroom Simulation Labs will extend OCC's and Morrisville's capacity to train entry-level workers and students enrolled in electrical, mechanical, and nuclear technology degree programs for work in advanced manufacturing and biomedical settings where precision devices used in global health applications are produced.

Potential business application: Manufacturing related businesses and advanced processors in environmental monitoring and medical instrumentation could test processes and/or problem solving techniques. Employers could use the facility to train workers on the latest quality control measures rather than on the manufacturing floor.

- ESF's Biomimicry Computer and Field Lab situates student learning at the intersection of biology and technology to identify sustainable solutions to the grand challenges of our time. Engineering solutions model biological successes in plant and animal life, and leverage human technology to scale these models for design improvements.

Potential business application: As the database from the lab becomes developed, R&D innovators from industry can utilize biomimicry science to develop practical applications from the natural world and apply these to manmade products. Brainstorming between business and biomimetic scientists can be done in a place that provides a specialized environment where ideas can be discussed, explored, simulated, tested and ultimately applied.



The simulation labs have potential for employers to test a wide range of process improvements before implementing them in the workplace.

For example, changes in service routines in a restaurant setting could be simulated in real time, testing various scenarios, without any impact or inconvenience to actual customers.

- The SUNY Morrisville/EOC Certified Nurse Aide Clinical Lab will provide students with training in the technology and tools used by Home Care and Personal Care Aides, such as industry-standard Electronic Medical Records (EMR) software, Calendar and Scheduling software, Digital Assistants (PDAs) and Mobile Computer Stations.

Potential business application: The lab can provide a place for hands on training for area home health aide businesses prior to working with clients. Employers also have a chance to observe students’ skills and to be a partner in student training to meet their specific business needs, guiding the newest workers to success on the job.

- The EOC Advanced Manufacturing Lab includes a separate unit on Green Production that is designed to increase computer skills and to develop machine operation skills. This grant will enable creation of an upgraded classroom with networked wiring to accommodate online delivery for increased student access.

Potential business application: Construction training, such as speciality jobs or deconstruction jobs, can be simulated here rather than on a job site. Also, provide a place to practice safety procedures before bringing workers on a new job site.

- The Medical Simulation Center at Upstate Medical University will provide students with high-fidelity rooms that simulate key patient care sites, such as an emergency room, intensive care unit or operating room. The space is equipped to develop team skills and appropriate responses to urgent or emergent situations. These rooms will be fully equipped to simultaneously transmit and record audio and videotapes of the session, to provide interaction with a “command room” for instruction and guidance, and for real time recording of performance.

Potential business application: Doctors and nurses from Central New York (or as far as participants would like to travel) could engage in specialized skills training for specific new procedures with the actual instruments. New protocols, such as for a small hospital Emergency Room, could be tested here without any impact on actual patient care.

- The “Smart Health” Biomedical Health Informatics (BHI) Research Lab at the SUNY Oswego Metro Center will address the revolutionary shifts in healthcare system by providing innovation for following tech-enhanced facets: globally connected digital health networks and the advance of ubiquitous intelligent agents, and the harnessing of Big Data and decision analytics.

Potential business application: Industry partners could collaborate with the lab’s intelligent health pavilion featuring professional stations for telehealth, the intelligent medical home, the intelligent hospital, the intelligent medical school, and a demo space for various advanced technology, shared by the different spaces, such as wearable health, mobile health, health robotics, radio frequency identification devices (RFIDs), and real-time location systems (RTLSS).

- The Biomedical Instrumentation Teaching Lab at SUNY Oswego’s Shineman Center for Science, Engineering & Innovation will be stocked with twelve workstations, at which students can work in groups of two, learning basic electrical engineering fundamentals and applying those skills to the operation, design, and construction of biomedical instruments in particular.

Potential business application: A device developer could test a wearable sensor that is monitoring the physiological and biochemical conditions of the human body, and wirelessly transmit data to both nearby and distant remote sites.

- Oswego’s Advanced Wireless Systems Research (ADWISR) Center Bioinformatics Wireless Network Development is the third component of our trio of labs providing a rich interconnection of instrument design, wireless interface, and best practices in processing data in health informatics professions. Updates will accommodate the 5G mobile data network.

Potential business application: Area healthcare providers will benefit from development of an integrated wireless network that would facilitate a seamless, efficient, operationally simple communication among the bioinformatics devices and physiologic sensors used by patients, patient care systems, doctors and pharmaceutical companies operating on different bands.

In addition to providing a workforce with advance skills, there are potentially thousands of business that could benefit from partnerships with the expertise offered through SUNY Labs to Jobs consortium, including:

Communications	Food Processing	Agriculture	Pharmaceuticals
Medical device manufacturing	Brewers	Architecture	Plastics and rubber products
Software development	Vintners	Engineering	Robotics
Education	Distillers	Construction	Textile products
Biotechnology	Packaging	Forestry	Transportation equipment manufacturing
Health care services	Transportation	Information Technology	Utilities
Public health	Logistics	Material development	Warehousing
Big Data	Manufacturing	Medicine	Waste management
	Robotics	Mining	

Economic Impact

The SUNY Labs to Jobs consortium will contribute to a robust and well trained workforce. The return of investment in a college education toward lifetime income begins at a 14.4% rate of return for those obtaining an associate’s degree at Onondaga. The average annual income with an associate degree (\$43,400) is 110% higher than someone without a high school diploma and 35% higher than someone with a high school diploma. The return on investment for education continues to escalate as students pursue bachelor’s, master’s and doctoral education.

The Labs to Jobs also will bring skills to those who have not held jobs or who are just entering the workforce. The new simulation labs will not only be able to serve more students but also will reinforce skills that will help with hiring and retention.

Bringing advanced innovation to businesses will also inspire research and development and has the potential to transform large slices of various sectors over the decade, including materials science, medicine, advanced computing, industrial processes, engineering, robotics, architecture, and transportation, based on the numbers of patents, scholarly articles, and commercial products either in development or on the market. A Brookings Institute study of the Upstate New York region confirmed that the best way to stimulate the Upstate economy is through support of education and medical institutions, which SUNY Labs to Jobs mirrors in real and practical ways, as well as innovative ones.

The SUNY Labs to Jobs consortium identified the measurable outcomes outlined below as the result of investment in this project. As Onondaga and Oswego offer multiple simulation lab sites, further details are in the appendix.

Metrics for the SUNY Labs to Jobs Consortium	Onondaga	ESF	Upstate	Oswego	EOC/Morrisville	TOTAL
Current students in degree programs who could benefit.	290	400	1,390	223	N/A	2,303
Current students/learners not in degree programs who could benefit. (certificate, non credit, cont. ed)	NA	500	900	9	857	2,266
New students, enrolled in degree programs, who could be accommodated or benefit from the facility.	100	100	250	376	840	1,666
New students/learners not in degree programs who could benefit (certificate, non credit, continuing ed)	625	1,500	500	157	780	3,562
Graduates placed in employment due to the lab. Total over first five years.	531	40	3,500	108	1,520	5,699
Faculty involved—our experts.	5	25	520	7	4	561
New staff to run lab programs.	5	3	12	3	2	25
Construction jobs	80	15	50	N/A	N/A	145
Internships/co-ops, per year.	105	30	N/A	30	780	945
Student clinical placements, per year. (eg hospitals and doctor's offices)	40	N/A	1,100	N/A	N/A	1,140
Revenue generation through demonstration, training opportunities, extramural funded research. Over 5 yrs	\$220,000	\$2 M	\$200,000	\$2.8 M	N/A	\$5.2 M
Potential # SUNY Partners in first five years. (Other than on proposal)	31	3	12	5	N/A	51
Potential # business partners over first five years.	12	8	10	108	N/A	138
Small Business Development Center start ups/expansions. Total over first five years.	5	2	1	5	N/A	13

Leveraged and Linkage Funding

The SUNY Labs to Jobs campuses (at right) have identified leverage and linkage funding that supports the aims of the simulation labs and centers and shows commitment to this project. The combined investment and greatly increases the scope and impact of this project to benefit the Central New York region and the state.

Campus	Simulation Lab
Onondaga CC	Food Science Lab at Center for Training and Entrepreneurship
Upstate Medical University	Medical Simulation Center
SUNY ESF	Biomimicry Lab and Initiative
SUNY Oswego	"Smart Health" Biomedical Health Informatics Research Lab and Biomedical Instrumentation Lab
EOC/SUNY Morrisville	Production Sciences/Manufacturing Lab
EOC/SUNY Morrisville	Allied Health Lab

Total Project Amount

Total Project Expenses

	A	B	C		A+B+C	
	State Grant Requested	External Funding Leveraged	Internal Funding Linkages - Directly supporting new project capital needs	Internal Funding Linkages - Previously invested in by the Campus (Capital and Operat-	Capital* (new Project capital costs funded by sources A, B & C)	Operating
Onondaga	\$4,377,565	\$8,843,805	\$403,272	\$-	\$4,791,105	\$8,833,537
Upstate	\$7,897,065	\$1,000,000	\$3,102,935	\$3,901,167	\$12,000,000	\$900,000
SUNY ESF	\$3,500,000	\$1,953,796	\$2,500,000	\$3,363,358	\$6,000,000	\$5,317,154
SUNY Oswego	\$2,008,914	\$270,000	\$40,000	\$3,479,005	\$2,318,914	\$387,005
EOC/Morrisville	\$96,900	\$-	\$427,348	\$-	\$96,900	\$427,348
EOC/Morrisville	\$128,470	\$-	\$302,266	\$-	\$128,470	\$302,266
	\$18,008,914	\$12,067,601	\$6,775,821	\$10,743,530	\$25,335,389	\$16,167,310

As detailed in the appendix, leveraged funds on behalf of the SUNY Labs to Jobs consortium include the following:

- Current and recently concluded ESF research grants related to the Adirondack species, biomimicry and applicable modeling from USDA Forest Service, USDA Cooperate State Research Service, Adirondack Research and Consulting, Northeast States for Coordinate Air Use Management; E&S Environmental Chemistry Incorporated: \$340,000.
- Two U.S. Department of Labor Trade Adjustment Assistance Community College Career Training grants focused on advanced manufacturing and food processing (\$3,147,513); U.S. Department of Labor Office of Disability Employment Policy cooperative agreement to train youth (ages 14-24) with disabilities for careers in technical fields, including advanced manufacturing and health information technology (\$5,208,250 anticipated over five years).
- OCC's long-standing Small Business Development Center, which will be leveraged to support START-UP NY business development (\$488,042).
- \$1 M of non-State/non-SUNY Chief Administrative Officer Funds held by the Upstate Foundation.

Linkage funds for SUNY Labs to Jobs include:

- \$1,115,278 in faculty salaries representing expertise related to biomimicry in Environmental and Forest Biology, Environmental and Resources Engineering, Forest and Natural Resources Management and Environmental Resources Engineering.
- \$2.5 M in capital in NYS legislative funding to renovate the Stone Carriage House in rural Newcomb, NY in Essex County will be applied to creating the Roosevelt Biomimetic Laboratory.
- \$2,248,080 in current and recently concluded ESF research grants related to the Adirondack species, biomimicry and applicable modeling from New York State including Cornell University, NYS Department of Environmental Conservation, NYS Office of Parks, Recreation and Historic Preservation.
- \$403,272 in faculty salaries in Health Information Technology and Hospitality Management programs.
- \$3.9M in existing capital and operating investments relating to the Clinical Skills Center and \$3.1M of Capital plan funds.

Implementation for the SUNY Labs to Jobs Consortium Project

The founding SUNY partners are building upon existing good partnerships to launch this new endeavor. In addition to the plans for education and outreach at specific facility sites, project partners will meet quarterly to measure progress on the SUNY Labs to Jobs metrics, make decisions on improving outcomes, and explore additional opportunities for business and SUNY collaboration.

Onondaga and Morrisville Timeline	Assessment
<p>January 2016</p> <ul style="list-style-type: none"> Negotiate lease for downtown Syracuse property to house Center for Training and Entrepreneurship labs. Bid construction for labs and support spaces. Begin equipment bidding processes. <p>February- August 2016</p> <ul style="list-style-type: none"> Build out and install equipment at Center for Training and Entrepreneurship site and EOC teaching begins. <p>May – December 2016</p> <ul style="list-style-type: none"> Construct Food Science and Culinary Lab and Business Simulation Classrooms. Student teaching begins. <p>January 2017-May 2017</p> <ul style="list-style-type: none"> Complete procurement and construction punch list items. 	<p>Assessment will be through a variety of measures, including student enrollment, retention, completion, job placement, and job retention data; feedback from students and employer partners; and quarterly meetings among project partners. Academic program quality also will be assessed through OCC's Institutional, Planning, Assessment, and Research Office consistent with established institutional processes. Assessment reports will be shared annually with the Labs to Jobs Consortium members.</p>

Oswego Timeline	Assessment
<p>January 2016</p> <ul style="list-style-type: none"> Negotiate lease with Syracuse Metro Center for Smart Health BHI Research Lab. Begin equipment requisition process. <p>February-June 2016</p> <ul style="list-style-type: none"> Build-out of lab and office spaces at the Metro Center. Procurement and installation of equipment at Shine-man Center Biomedical Instrumentation Teaching Lab and Advanced Wireless Systems Research Center. <p>July-August 2016</p> <ul style="list-style-type: none"> Install, set up and test equipment in Metro Center and Shineman Center. <p>September 2016</p> <ul style="list-style-type: none"> Students enrolled in courses and all three labs fully operational. 	<p>The SUNY Labs to Jobs Consortium will build on existing partnerships among these institutions established as a result of the SUNY2020 Round II award for the Institute for Environmental Health and Environmental Medicine. Individual labs and their progress will be assessed in conjunction with external grant monitoring, and external accreditation from CAHIIM, ABET, and others as appropriate. Degree programs will be assessed in conjunction with established program assessment processes and assessment reports will be shared annually with the Labs to Jobs Consortium members.</p>

SUNY-ESF Timeline	Assessment
<p>January 2016 - May 2016</p> <ul style="list-style-type: none"> Equipment requisition process. <ul style="list-style-type: none"> Design process for renovation for Roosevelt Biomimetics Laboratory in Newcomb <p>June 2016 –March 2017</p> <ul style="list-style-type: none"> Installation set up and test equipment at Syracuse Campus <p>March 2016 – August 2016</p> <ul style="list-style-type: none"> Bidding and procurement for renovation of Roosevelt Biomimetics Laboratory <p>September 2016 – March 2017</p> <ul style="list-style-type: none"> Renovation of Stone Carriage house for Roosevelt Lab <p>April 2017 – May 2017</p> <ul style="list-style-type: none"> Installation set up and test equipment for Roosevelt Lab 	<p>September 2017</p> <ul style="list-style-type: none"> Opening of Roosevelt Biomimetics Laboratory, Biomimetics Data Center and Biomimetics Imagineering Studio <p>The SUNY Labs to Jobs Consortium will build on existing partnerships among these institutions established and ongoing as a result of the SUNY2020 Round II award for the Institute for Environmental Health and Environmental Medicine and Round III SUNY Water Research and Education Center at Onondaga Lake. Project partners will meet quarterly to measure progress on the SUNY Labs to Jobs metrics including Start-UP New York and Open SUNY goals and make decisions on steps to improve outcomes. Assessment reports will be shared annually with the Labs to Jobs Consortium members.</p>

Upstate Timeline	Assessment
<p>January 2016</p> <ul style="list-style-type: none"> Continue with review of programming and schematic design. <p>February- April 2016</p> <ul style="list-style-type: none"> Design and construction documents <p>July 2016- May 2017</p> <ul style="list-style-type: none"> Construction <p>July 2016-March 2017</p> <ul style="list-style-type: none"> Specialized equipment procurement <p>July 2017</p> <ul style="list-style-type: none"> Occupancy 	<p>In addition to the same commitments as other SUNY Labs to Jobs Consortium founding members, Upstate assessments include, but are not limited to, the following accrediting bodies:</p> <p>American Association of Colleges of Nursing; Commission on Collegiate Nursing Education; Commission on Collegiate Nursing Education; Liaison Committee on Medical Education; Commission on the Accreditation of Physical Therapy Education; Commission on the Accreditation of Allied Health Profession Education Programs; Joint Review Committee on Education in Radiologic Technology; Commission on Accreditation for Respiratory Care; Accreditation Review Commission on Education for Physician Assistant; Middle States Commission on Higher Education; Accreditation Council for Continuing Medical Education (ACCME); Committee on Accreditation of Educational Programs for the Emergency Medical Services Professions.</p>

Appendix

Letters of Support for the SUNY Labs to Jobs proposal

Support is represented among the SUNY partners, our governmental officials, and agencies and businesses critical three major workforce sectors • Health, Biomedical Services, and Biosciences • Advanced Manufacturing • Agribusiness and Food Processing.

Onondaga Community College Casey Crabill, EdD President	City of Syracuse Paul Driscoll Commissioner	Centers for Disease Control and Prevention James Hayslett, PharmD, MPH Office of Public Health Preparedness and Response	Tops Friendly Markets Tabitha Rusk Human Resources Manager
SUNY Oswego Deborah F. Stanley, JD President	City of Oswego Thomas W. Gillen Mayor	Hospital Executive Council Ronald Lagoe Executive Director	G&C Food Distributors & Brokers Inc. Sara Johnson Director of Organizational Development
Upstate Medical University Gregory L. Eastwood, MD President	CenterState CEO Robert M. Simpson President, CenterState CEO and Co-Chair, CNY REDC	Upstate University Hospital John B. McCabe, MD Chief Executive Officer Senior Vice President for Hospital Affairs	Work Train Dominic Robinson Director
State University of New York College of Environmental Science and Forestry Quentin D. Wheeler, PhD President	The Manufacturer's Association (MACNY) Randy Wolken President and CEO	Crouse Hospital Kimberlyn Boynton President and Chief Executive Officer	Darco Manufacturing, Inc. Laura Miller General Manager
Morrisville State College William J. Mirabito, PhD President	County of Onondaga Office of Economic Development Julie A. Cerio Director	St. Joseph's Hospital Health Center Kathryn H. Ruscitto President and CEO	1199SEIU Georges Marceau Field Coordinator
Honorable Patty Ritchie New York State Senator 48th District	County of Oswego Industrial Development Agency L. Michael Treadwell, CECD Chief Executive Officer	Loretto Health Kimberly Townsend President and CEO	The New York Botanical Garden Dennis Wm. Stevenson, PhD Vice President for Botanical Research
Honorable John A. DeFrancisco New York State Senator 50th District	Central New York Regional Planning & Development Board Chris Carrick Energy Program Manager	Food Bank of Central New York Kathleen L. Stress Executive Director	Adjunct Professor at Columbia University, Cornell University, New York University and Yale University
Honorable William A. Barclay Member of New York State Assembly 120th District	CNY Technology Development Organization, Inc. (TDO) Cindy L. Oehmigen President/CNYMEP Center Director	American Museum of Natural History Ward Wheeler, PhD Curator and Professor, Division of Invertebrate Zoology	American Museum of Natural History (Madrid, Spain) Antonio G. Valdecasas Senior Researcher, MNCN, CSIC
Honorable Samuel D. Roberts Member of New York State Assembly 128th District	Greater Oswego-Fulton Chamber of Commerce Greg Mills Executive Director	Perdue AgriBusiness Dennis Lard New York Regional Manager	National Museum of Natural History (Madrid, Spain) Antonio G. Valdecasas Senior Researcher, MNCN, CSIC
Honorable William B. Magnarelli Member of New York State Assembly 129th District	Corning Incorporated Richard M. Eglen, Ph.D. Vice President and General Manager	American Food & Vending Joshua J. Wells Chief Operating Officer	University of Arizona James L. Buizer Professor, School of Natural Resources and the Environment Director, Climate Adaptation and International Development
Honorable Robert C. Oaks Member of New York State Assembly 130th District	Inficon, Inc. Peter G. Maier President	Agrana Fruit US, Inc. Sean Patterson, SPHR Human Resources Manager	Arizona State University Nico M. Franz, PhD Director, Biodiversity Knowledge Integration Center Associate Professor, School of Life Sciences
Onondaga County Executive Joanie M. Mahoney County Executive	MedTech Association Jessica Crawford President	Byrne Dairy Scott Matukas CFO	
Oswego County Administrator Philip Church County Administrator		HP Hood LLC Hank Malcom Human Resources Director	