

# RAISING CAPITAL

# OHIO STATE START UPS



# OHIO STATE STARTUPS

**NEW VENTURES**  
AT THE OHIO STATE  
UNIVERSITY



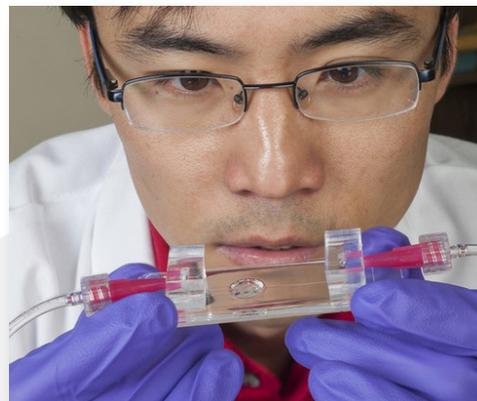
**THE OHIO STATE UNIVERSITY**

# Innovation at The Ohio State University

The Ohio State University supports creativity, innovation, commercialization, and entrepreneurship as essential components of an academic research institution and crucial factors needed to accomplish the mission of a land-grant university.

Ohio State's research and academic programs exhibit a tremendous breadth and depth. Recognized for academic performance, research collaborations, a top-rated medical center, a premier cancer hospital, and a state-of-the-art heart hospital, the university is a leader among institutions of higher education.

Ohio State ranks 3rd nationally among all research universities in industry-sponsored research, according to statistics compiled by the National Science Foundation. The scope and excellence of research programs make Ohio State a leading force of innovation and change — locally, nationally, and globally.



## Licensing to Startups

One path to commercializing a technology is licensing it to a newly formed company. Startups provide essential development flexibility to early-stage technologies needing refinement prior to entering the marketplace.

Ohio State's startup portfolio continues to grow as more entrepreneurs connect with the university's high-potential innovations. Many resources exist to provide support for companies formed around Ohio State technologies within both the university as well as the central Ohio community.

## Ohio State Innovation Foundation

The Ohio State Innovation Foundation (OSIF) is a not-for-profit Ohio corporation formed in 2013 to hold, manage, and facilitate commercialization of the university's intellectual property.

## Startups by the Numbers

57

PORTFOLIO  
COMPANIES

45

CREATED IN  
2013 - 2016

\$65+  
MILLION

FUNDING  
RAISED

## Startup Company Support Services

### Rev1 Ventures

Ohio State works with Rev1 to help entrepreneurs in the region build great companies. Rev1's team of experts leads an ongoing, data-driven process that ensures entrepreneurs develop products that people want and companies that people need.



### Validation

#### Rev1's Concept Academy

Concept Academy is designed to help entrepreneurs validate their concepts and focus on features that are of greatest interest to end users, before spending time and money on manufacturing and marketing.

#### Customer Aligned Startup Training (CAST)

Technologies chosen by the TCO for CAST (Customer Aligned Startup Training) undergo considerable customer validation. Over the course of fifteen weeks, students conduct market research on a particular technology of their choosing. At the end of the semester, CAST students present their findings and recommendations.

### Networking

#### First Connect Network

First Connect helps startups secure expertise in four critical areas to mitigate risk and accelerate milestones, especially during companies' critical first six months.

- Connecting entrepreneurs with their first strategic advisors.
- Linking entrepreneurs to their first group of industry experts.
- Helping entrepreneurs find their first customers.
- Being a catalyst for talent.

#### Ohio State Startup Leader Dinner

Established for all of Ohio State's licensees, this dinner for startup leaders provides the chance to share best practices, create a community, and foster growth of university startups.

#### Startup Snapshot

Startup Snapshot is a chance for entrepreneurs, investors, and inventors to interact, connect, and preview Ohio State's startup portfolio. Inventors and entrepreneurs present brief overviews of their technologies, followed by a networking session.



# Ohio State Startup Companies

Startups are categorized by the Discovery Themes:



Health and Wellness



Data Analytics



Energy and Environment



Humanities and Arts



Food and Safety

## Health and Wellness



### Neurxstem, Inc.

Neurxstem has developed a proprietary process to grow synthetic neural organoids, engineered from the skin cells of an adult patient. The organoid is essentially a model of the human central nervous system which researchers can use to study debilitating brain diseases such as Alzheimer’s disease, autism and brain cancer and then use these models to discover and study the safety and efficacy of future drugs.

College of Medicine  
Licensed: FY17  
Inventor: Rene Anand  
CEO: Rene Anand



### MatchTx, LLC

MatchTx is at the forefront of delivering personalized medicine that can predict health outcomes. The company has developed a proprietary algorithm that can match disease types with the medicine that is most likely to be effective. The technology uses data that has been generated at the university over many years.

College of Medicine  
Licensed: FY16  
Inventor: James Chen  
CEO: Jeff Spitzner



### AccuFiber Technologies, LLC

AccuFiber Technologies is developing a method of detecting leaks in negative pressure wound therapy (NPWT) bandages. NPWT creates a vacuum around the wound, which requires an airtight seal. Even miniscule leaks in the seal create problems and are difficult to detect. AccuFiber’s technology provides quick, easy identification of the source of the leak that will allow NPWT dressings to be applied over larger and more irregular areas, increasing usage and effectiveness.

College of Engineering  
Licensed: FY16  
Inventor: John Lannutti  
CEO: John Lannutti

## Discovery Themes:



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### 3DBioResins, LLC

3D BioResins is the first commercial entity offering scaled production of polypropylene fumarate (PPF). PPF is one of the most heavily researched resorbable polymers for bone tissue-engineering applications. Traditionally, PPF has been a difficult, expensive, and time-consuming substance to synthesize with consistent material properties and at the low molecular weight needed for good resorption. The 3D BioResins' technology enables rapid scale-up to reliable, industrial PPF production. Additionally, the proprietary synthesis and production methods can facilitate FDA medical device indications due to the favorable and reliable properties imparted to PPF using these methods.

College of Medicine  
Licensed: FY16  
Inventor: David Dean  
CEO: Vacant



### Prelude Therapeutics, Inc.

*Chromatin* consists of DNA wrapped around nucleosomes and it packages our genome into chromosomes. Prelude was formed to discover and develop new medicines targeting chromatin function to treat cancer and rare diseases.

College of Medicine  
Licensed: FY16  
Inventor: Robert Baiocchi  
CEO: Kris Vaddi



### The Difference USA, LLC

The Difference USA was formed by former Ohio State University strength and conditioning coach, Anthony Schlegel, for the purpose of commercializing "The Difference." The Difference is a pad and attachable unit that can be further attached to stationary inanimate objects for the purpose of optimizing hand placement and strike force for athletic, recreational, and entertainment performance applications.

Athletics  
Licensed: FY16  
Inventor: Anthony Schlegel  
CEO: Anthony Schlegel



### Games That Move You, PBC

Games That Move You created and validated a new stroke recovery therapy tool, Recovery Rapids. Facilitated as a software and hardware service, Recovery Rapids helps stroke victims regain and improve motor control through physical simulation therapy. The tool is clinically proven to increase patient therapy engagement and outcomes.

College of Medicine  
Licensed: FY15  
Inventor: Lynne Gauthier  
CEO: Roger Crawfis

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### **Rekovo, LLC**

Rekovo uses movement and art to engage patients in a more enjoyable physical therapy experience. Rekovo's product, Agile Arts, has been clinically demonstrated to improve therapy outcomes and increase patient engagement and satisfaction. The new therapy tool is covered by multiple existing medical billing codes, allowing it to apply to a wide range of therapies, from stroke recovery to spinal rehab and the growing need for balance therapy in the elderly.

College of Medicine  
Licensed: FY15  
Inventor: Lise Worthen-Chaudhari  
CEO: Todd Whittington



### **Sight4All, Inc.**

Sight4All is creating a software application that converts an electronic tablet into a device capable of performing the measurements required to determine an accurate prescription for eyeglasses, as well as a quantifiable measure of eye alignment.

College of Optometry  
Licensed: FY15  
Inventor: Melissa Bailey  
CEO: Stephen Wallace



### **CancerBridge, LLC**

CancerBridge's platform provides employers with the ability to offer their employees a telephonic navigation line for access to both a cancer-certified nurse and a cancer super-subspecialist physician for cancer related inquiries. Built and spun out of the James Cancer Center, CancerBridge is a fusion of cancer inquiry, care navigation workflow, and a sophisticated call center routing technology linking patients and super-subspecialty cancer physicians for specific inquiries in minutes versus days or weeks.

College of Medicine  
Licensed: FY15  
Inventor: Michael Caligiuri  
CEO: Kent Bowen



### **Inthera Biosciences, AG**

Inthera Bioscience is a private Swiss biopharmaceutical company focused on developing inhibitors of intracellular protein-protein interactions employing a proprietary technology platform. Rationally designed, these molecules display hot spot residues on a non-peptidic backbone merging the versatility of small molecules with the specificity of biologics. Inthera's lead programs focus on HPV-associated cancers and hypoxia-inducible signaling.

College of Veterinary Medicine  
Licensed: FY14  
Inventor: Quintin Pan, Jianrong Li  
CEO: Ulrich Kessler

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### **ENTvantage Diagnostics, Inc.**

ENTvantage Diagnostics provides a test invented by researchers from The Ohio State University and Nationwide Children's Hospital that rapidly determines if a sinus infection is caused by a virus or bacteria. The cause of the sinus infection is information that can be essential in curbing overuse of antibiotics and the evolution of antibiotic-resistant bugs.

College of Medicine  
Licensed: FY14  
Inventor: Subinoy Das  
CEO: Joseph Skraba



### **Sirona Therapeutics, Inc.**

Sirona Therapeutics is commercializing an oral patch that directly delivers drugs to combat pre-cancerous lesions and prevent these lesions from developing into disfigurement and potentially fatal oral cancer.

College of Dentistry  
Licensed: FY14  
Inventor: Susan Mallery  
CEO: Peter Stoelzle



### **Spirometrix, Inc.**

Spirometrix provides cost effective, non-invasive products for the management of many chronic respiratory diseases, such as asthma, COPD, and pulmonary hypertension. Spirometrix's first commercial product is a device that facilitates the diagnosis and management of airway inflammation (i.e. asthma) in the physician's office.

College of Arts and Sciences  
Licensed: FY14  
Inventor: Prabir Dutta  
CEO: Dean Zikria



### **Adaptive Sensory Technologies, LLC**

Adaptive Sensory Technologies (AST) provides novel cross-platform assessments of eye disease. AST implements rapid and reliable eye tests on medical and mobile devices to conveniently deliver sensory system biomarkers that improve clinical evaluation and enable smaller, shorter clinical trials.

College of Arts and Sciences  
Licensed: FY14  
Inventor: Zhong-lin Lu  
CEO: Luis Lesmes

# Ohio State Startup Companies

## Discovery Themes:



Health and Wellness



Data Analytics



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Humanities and Arts



Food and Safety



### Columbus Nutraceutical Formulations, LLC

Columbus Nutraceutical Formulations is a faculty start-up company formed to commercialize nutritional supplements developed at The Ohio State University. These products include an eye health nutritional supplement, a women's aerobic performance-enhancing supplement, and a coffee formulation with enhanced supplements.

College of Education and Human Ecology

Licensed: FY13

Inventor: Bob DiSilvestro

CEO: Bob DiSilvestro



### Core Quantum Technologies, Inc.

Core Quantum Technologies (CQT) specializes in a type of nano-particle that emits different colors and is used to tag molecules in biomedical tests. CQT's primary product, the MultiDot, is a group of semi-conductor nanoparticle quantum dots encapsulated in polymer-based micelles that allow researchers to continuously track tagged molecules with greater brightness, longevity and stability than currently available technologies. In biomedical applications, researchers can attach the MultiDot to specific cell structures and better identify and understand disease progression.

College of Engineering

Licensed: FY13

Inventor: Jessica Winter

CEO: Vacant



### MediNutra, LLC

MediNutra is a nutraceutical company commercializing meal replacement strategies for specific medical procedures, such as bariatric surgery, and conditions that lead to unwanted weight loss.

College of Education and Human Ecology

Licensed: FY13

Inventor: Bob DiSilvestro

CEO: Bob DiSilvestro



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### **Perfect Practice, Inc.**

Perfect Practice, Inc. was founded by a physical therapist and a mechanical engineer to bring real-time core stability biofeedback training to clinics, athletes, and home users everywhere. The company's core Execution line of products delivers customized cloud-based mobile solutions to the equestrian (CoreXEquine.com), elite sports (CoreXSports.com), and physical therapy (CoreXTherapy.com) markets for building the core stability needed to maximize performance and minimize injury.

College of Education and Human Ecology  
Licensed: FY13  
Inventor: Ajit Chaudhari  
CEO: Ajit Chaudhari



### **TheraVasc Veterinary, Inc.**

TheraVasc, Inc. is a privately-held, Ohio-based pharmaceutical company which is developing treatments for various chronic medical diseases using an oral formulation of sodium nitrite. Sodium nitrite promotes wound healing and prevents tissue necrosis in diabetic animals.

College of Veterinary Medicine  
Licensed: FY13  
Inventor: Patrick Green  
CEO: Tony Giordano



### **Allostatix, LLC**

Allostatix provides a platform system for the delivery of wellness assessment and health management tools with the mission of keeping people healthy, preventing the onset of lifestyle-induced chronic disease, and empowering individuals to manage their own health.

College of Medicine  
Licensed: FY12  
Inventor: Ulysses Magalang  
CEO: Gordon Horwitz



### **ExCMR, Inc.**

ExCMR's MRI-compatible treadmill enables superior cardiovascular exercise stress testing. The stress test is an important detection diagnostic for cardiovascular disease, but has not been available for use in the magnetic MRI environment, despite MRI being the superior modality for such tests. EXCMR has scanned over 600 patients in a multicenter hospital trial utilizing four beta units.

College of Medicine  
Licensed: FY09  
Inventor: Lon Simonetti  
CEO: Ernie Knight

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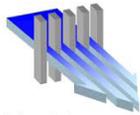
Energy and  
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Humanities  
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Food and  
Safety



NANOMEDICALSYSTEMS

### **Nano Medical Systems, Inc.**

NanoMedical Systems is an innovation company focused on the commercialization of revolutionary silicon-based medical nanotechnology products that address unmet clinical needs for personalized drug delivery systems. Nanomedical Systems' technology platforms embody semiconductor, biotechnology, nano-materials, and medical sciences. The company works with technology and medical research partners for fast, agile, and capital-efficient research and development.

College of Medicine  
Licensed: FY08  
Inventor: Mauro Ferrari  
CEO: Randy Goodall



### **Child and Family Psychological Services, Inc.**

Child and Family Psychological Services (CFPS) provides educational materials to help therapists treat children with bipolar disorder.

College of Medicine  
Licensed: FY07  
Inventor: Mary Fristad  
CEO: Mary Fristad



### **Oncolmmune, Inc.**

Oncolmmune specializes in therapeutics for autoimmune and infectious diseases, such as multiple sclerosis, rheumatoid arthritis and sepsis, as well as for certain cancers, including tuberous sclerosis, acute myeloid leukemia, and diabetic nephropathy. The technologies include protein therapeutics, monoclonal antibodies, and small molecular drugs.

College of Medicine  
Licensed: FY05  
Inventor: Yang Liu  
CEO: Xincheng Zheng



### **Enlyton, Ltd**

Enlyton improves all modalities of cancer imaging by providing cancer-specific images that more accurately reflect the extent of disease. Improved cancer imaging enables healthcare workers to provide more definitive interpretations, diagnoses, and treatment plans specific to patients' needs.

College of College of Engineering  
Licensed: FY04  
Inventors: Thomas Magliery, Charles Hitchcock, Stephen P. Povoski, Vish V. Subramaniam, Duxin Sun, Ron X. Xu  
CEO: Herbert Neuman

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### InGex, LLC

InGex provides genetic marking for cancer detection by using RNA sequencing kits to provide analysis that aids in the detection and potential diagnosis of certain cancers. The company licenses proprietary technology from The Ohio State University and University of Texas – Austin.

College of Arts and Sciences

Licensed: FY00

Inventor: Alan Lambowitz

CEO: Paul Gold



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## Data Analytics



### Med-Compliance IQ, Inc

MedCompliance IQ is commercializing WoundWise, a software that utilizes The Ohio State University's patent-pending technology to identify, analyze and document discrete elements required for Medicare/Medicaid compliance and to provide decision support to medical personnel in healing chronic wounds.

College of Medicine

Licensed: FY17

Inventor: Metin Gurcan

CEO: Gary Ross



### MassMatrix

MassMatrix addresses the challenge of converting raw experimental mass spectrometry data into usable information about proteins. The technology uses algorithms to score proteins based on probabilistic models.

College of Medicine

Licensed: FY16

Inventor: Michael Freitas

CEO: G. Hall Johnson

# Ohio State Startup Companies

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### SpineDynX **SpineDynx, LLC**

SpineDynx was created to commercialize the clinical Lumbar Motion Monitor (LLM), a technology that documents spine kinematics and interprets risk to an individual's low spine resulting from the work environment. The end goal is to assess and reduce occupational risk and impairment of individuals.

College of Engineering  
Licensed: FY16  
Inventor: Bill Marras  
CEO: Curtis Crocker



### **Greater Fool, LLC**

Greater Fool is a platform for mouse lab research organizations for use on the Apple iPad. Its tool, Mouseville, is used by researchers to meet their critical needs in organizing research efforts in mouse labs for cancer research studies. The technology encompasses both cloud-based data storage and an iPad application for researchers to facilitate and organize mouse breeding and research activities.

College of Health Sciences  
Licensed: FY15  
Inventor: David Taffany  
CEO: David Taffany



### **Delphic DB**

Delphic DB has licensed technology and software that enables rapid large dataset querying. The company's initial targets are the insurance and banking industries.

College of Engineering  
Licensed: FY15  
Inventor: Arnab Nandi  
CEO: Victor Thorne



### **Signet Accel, LLC**

Signet Accel provides next-generation health care information exchange and analytics. The Company's Acelematics-TR® Software Suite enables advanced data management, integration, and analysis to support population health, personalized medicine, and drug discovery.

College of Medicine  
Licensed: FY14  
Inventors: Philip Payne, Peter Embi  
CEO: John Raden

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### **Readiness Analytics, LLC**

Readiness Analytics offers the Readiness Test, a disaster planning readiness measurement software. Using a model of organizational recoverability, families and organizations can use this tool to measure their preparedness for disaster. This straightforward assessment tool uses a series of questions to create a measurement of readiness and estimate recoverability.

Office of Academic Affairs  
Licensed: FY14  
Inventor: David Lindstedt  
CEO: David Lindstedt



### **Ambassador Software Group, Ltd**

Ambassador offers proprietary algorithms that identify the source of low consumer satisfaction scores in hospitals, allowing the hospital to take corrective action. These scores are increasingly important as the government—as part of the Affordable Care Act—and insurers now tie reimbursements to these metrics.

College of Medicine  
Licensed: FY13  
Inventor: Justin Pestrue  
CEO: Tim Newcome



### **innobly, Inc**

innobly solves the bandwidth-crunch problem by using sophisticated prediction and scheduling algorithms to shift network usage to frequencies with lower utilization. The technology works by preloading high-bandwidth content on Wi-Fi or low-network-traffic intervals, reducing network congestion and eliminating buffering delays.

College of Engineering  
Licensed: FY13  
Inventor: Hesham El Gamal  
CEO: Hesham El Gamal



### **Amber Intellectual, LLC**

Ohio State-developed Amber Intellectual adapts code for its customers for use in a particular application and topographic file format. Amber itself does not engage in research and development or manufacturing, nor does it pursue regulatory approval for its customized code.

Office of Academic Affairs  
Licensed: FY06  
Inventor: Cynthia Roberts  
CEO: Cynthia Roberts

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## Transchart, LLC

TransChart's mission is to help healthcare professionals who serve transplant candidates and recipients. TransChart provides software tools that, coupled with specialized services, facilitate improved management of every facet of the transplant continuum of care.

College of Medicine  
Licensed: FY06  
Inventor: Ron Ferguson  
CEO: John Townsend



## Tech4Imaging, LLC

Tech4Imaging produces an electrical capacitance volume tomography (ECVT) imaging system. ECVT is a recently-developed technology capable of providing 3-D volume images by reconstructing electrical signals acquired from a capacitance sensor. The company's ECTV technology enables non-invasive, three dimensional, visualization of various industrial processes in such areas as energy, aerospace, automotive, and pharmaceuticals.

College of Engineering  
Licensed: FY08  
Inventor: Liang-Shih Fan  
CEO: Qussai Marshdeh



## Health Care DataWorks, Inc - Health Catalyst

Health Care DataWorks provides business intelligence solutions that enable healthcare organizations to improve their quality of care and reduce costs. Through its pioneering KnowledgeEdge™ product suite, Health Care Dataworks delivers an enterprise data warehouse necessary for hospitals and health systems to effectively and efficiently gain deeper insights into their operations.

College of Medicine  
Licensed: FY09  
Inventor: Jyoti Kamal

Acquired by Health Catalyst on July 31st, 2015.



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## Energy and Environment



### Circular Wave Drive Partners, Inc.

Circular Wave Drive was created to commercialize a speed-reducing gear invented by Dr. Yuan Zheng. Compared to the current gold standard speed reducers, such as the harmonic wave drive, Dr. Zheng's novel technology is less expensive to produce, theoretically can achieve a much broader range of reduction ratios (2:1 to 1500:1), and can operate in much harsher environments. These benefits would allow the gear to displace older drive systems, particularly in robotics, and open new market applications.

College of Engineering  
Licensed: FY15  
Inventor: Yuan Zheng  
CEO: Rodolfo Bellesi



### Durable Poly Solutions, LLC

Durable Poly Solutions has licensed a patented methodology to produce polyol foam from lignocellulosic biomass (plant dry matter) using a solvent containing crude glycerin. Durable Poly Solutions will be developing and selling polyol-based foam products for pipeline support, spray foam insulation, board stock insulation and packaging foam.

College of Food, Agricultural, and Environmental Sciences  
Licensed: FY15  
Inventor: Yebo Li  
CEO: Ernie Malas



### Nikola Labs, Inc.

Nikola Labs is developing an energy harvesting technology for electronic devices that captures ambient cellular and Wi-Fi signals and uses the captured energy to extend battery life. Potential products that leverage this technology include: cell phones, wireless battery packs, "internet of things" sensor systems, and rechargeable medical devices.

College of Engineering  
Licensed: FY15  
Inventor: Chi-Chih Chen  
CEO: Will Zell



### TeraProbes, Inc.

TeraProbes was formed to develop and commercialize non-contact testing technology for high frequency devices such as microchips, semi-conductors and next generation electronics. This new technology is superior to conventional contact-based probes because it enables automated, industrial-scale electronic testing, reducing potential damage to both chips and probes. This technology also enables unattended inspection of every chip, thus reducing capital equipment and labor costs from testing cycles.

College of Engineering  
Licensed: FY15  
Inventor: Kubilay Sertel  
CEO: Kubilay Sertel

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### Simple-Fill, Inc.

Natural gas is a safe, clean fuel alternative to gasoline. In order to be used in the automotive market, natural gas must be compressed for delivery and fueling. Simple-Fill's innovation is a technology that creates a smaller, more efficient natural gas compressor that requires little maintenance and is half the expense of small-scale reciprocating compressors.

College of Engineering

Licensed: FY14

Inventors: CG Cantemir, Jim Durand, Fabio Chiara, Marcello Canova, Jerry Fly, Rob Underhill, Matteo Triberti

CEO: Rob Underhill



### QuTel, Inc.

Quantum tunneling electronics opens a new paradigm for the manufacture of semiconductor microchips. The current technology, complementary metal oxide semiconductor (CMOS), uses positive and negative charge carriers (transistors) to induce electrical conductivity in the semiconductor materials. However, the flow of positive and negative charges creates resistance that manifests as heat, and thereby limits the speed at which the microprocessors can operate. QuTel's technology reduces the resistance and allows for ultra-low voltage and ultra-low power operation for semiconductor devices, enabling a dramatically faster, more efficient means of microchip manufacturing.

College of Engineering

Licensed: FY14

Inventor: Paul Berger

CEO: Paul Berger



### CGC Ultramarine, LLC

CGC Ultramarine specializes in high-performance naval propulsion systems. The Marine Jet Propulsion System (MJPS) technology offered by CGC Ultramarine is designed to perform as a high power inboard and outboard engine, with a power output in the 500-10,000 Hp range and a focus on units above 1000 Hp.

College of Engineering

Licensed: FY15

Inventor: CG Cantemir

CEO: CG Cantemir



### EnergyEne, Inc.

EnergyEne is developing and commercializing high-performance/ non-immunogenic biomaterials for the medical and consumer healthcare arenas. The company utilizes atypical rubber-producing feedstocks (e.g. guayule), combined with proprietary processing methodologies, to enable specialty latex-derived materials. A byproduct of this process is an energy-rich residual biomass that can be used in biofuel hydrocarbon production.

College of Food, Agricultural, and Environmental Sciences

Licensed: FY14

Inventor: Katrina Cornish

CEO: Katrina Cornish

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## Humanities and Arts



### ALC Innovations, LLC

Anyone who has been served a drink in a restaurant has occasionally noticed a lipstick stain on the “clean” glass. ALC is commercializing a non-toxic cleanser that quickly and easily removes waxy substances, such as lipstick, from glassware without leaving behind a taste or a scent.

College of Arts & Sciences

Licensed: FY17

Inventor: Christopher Callam

CEO: Chris Crader



### SolitonReach, Inc

SolitonReach is dedicated to commercializing a novel means for mobile device users to interact with their device displays. Proprietary sensors positioned on the arm of the user and wirelessly communicating with the device will allow a user’s “virtual hand” to appear in the displayed scene and be fully interactive with objects and persons in the scene.

College of Engineering

Licensed: FY16

Inventor: Furrukh Khan

CEO: Erica Waite



### Global Reach

Global Reach provides a software platform directed to universities that provides video and written documentation of a foreign student applicant’s English language skills. This data can be used to meet certain government requirements for J-1 visas, as well as to appropriately match students with ESL resources.

College of Arts and Sciences

Licensed: FY15

Inventor: Galal Walker

CEO: Keith Johanns



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## Food and Safety



### Saber Biotics

Saber Biotics is commercializing a selective salmonella-enrichment media (SSM™). This tool can detect the presence of salmonella, even when present in only trace amounts, and has valuable applications in food and water safety, food production, and animal and human health.

College of Medicine  
Licensed: FY15  
Inventor: Anice Sabag-Daigle  
CEO: Brian Ahmer



### 3BAR Biologics, Inc.

3Bar Biologics has packaged specific biological agents with an on-site bioreactor to deliver “live” biologicals to the field. Without 3Bar’s disruptive technology, biologicals must be activated at a manufacturing facility, and 99% do not survive the trip through the supply chain to the farm. 3Bar’s innovative line of crop defense is free of chemicals, has an efficient application process, and creates greater yields in production agriculture.

College of Food, Agricultural, and Environmental Sciences  
Licensed: FY14  
Inventor: Bruce Caldwell, Brian McSpadden-Gardener  
CEO: Bruce Caldwell



### LARAD, Inc.

LARAD specializes in new vaccines and diagnostic reagents for food-animal diseases. LARAD’s initial focus is developing virus-like particle vaccines and diagnostics using molecular technology for an immunosuppressive disease in poultry caused by the infectious bursal disease virus.

College of Food, Agricultural, and Environmental Sciences  
Licensed: FY14  
Inventor: Daral Jackwood  
CEO: Daral Jackwood



### ProteoSense, LLC

ProteoSense is developing the first handheld device that detects fundamental protein markers of pathogens such as salmonella, e.coli, and listeria. Using an enrichment-free, diagnostic sensor technology, the company is able to detect specific proteins in a small, liquified sample in minutes. Initially, ProteoSense is focusing on detecting serious threats to food safety in fresh produce throughout the supply chain.

College of Engineering  
Licensed: FY14  
Inventor: Stephen Lee, Wu Lu, Paul Berger, Leonard Brillson, Gregg Hadley, Ronald Pelletier, the late Professor Charles Orosz, John Shapiro, Samit Gupta, Patrick Adams, Andrew Theiss, Patricia Casal  
CEO: Mark Byrne

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### **Egg Tech, Ltd.**

Three Family Farms pasteurizes eggs in the shell using a breakthrough process that utilizes heat and ozone to improve egg quality and shorten pasteurizing time.

College of Medicine

Licensed: FY02

Inventor: Ahmed Yousef

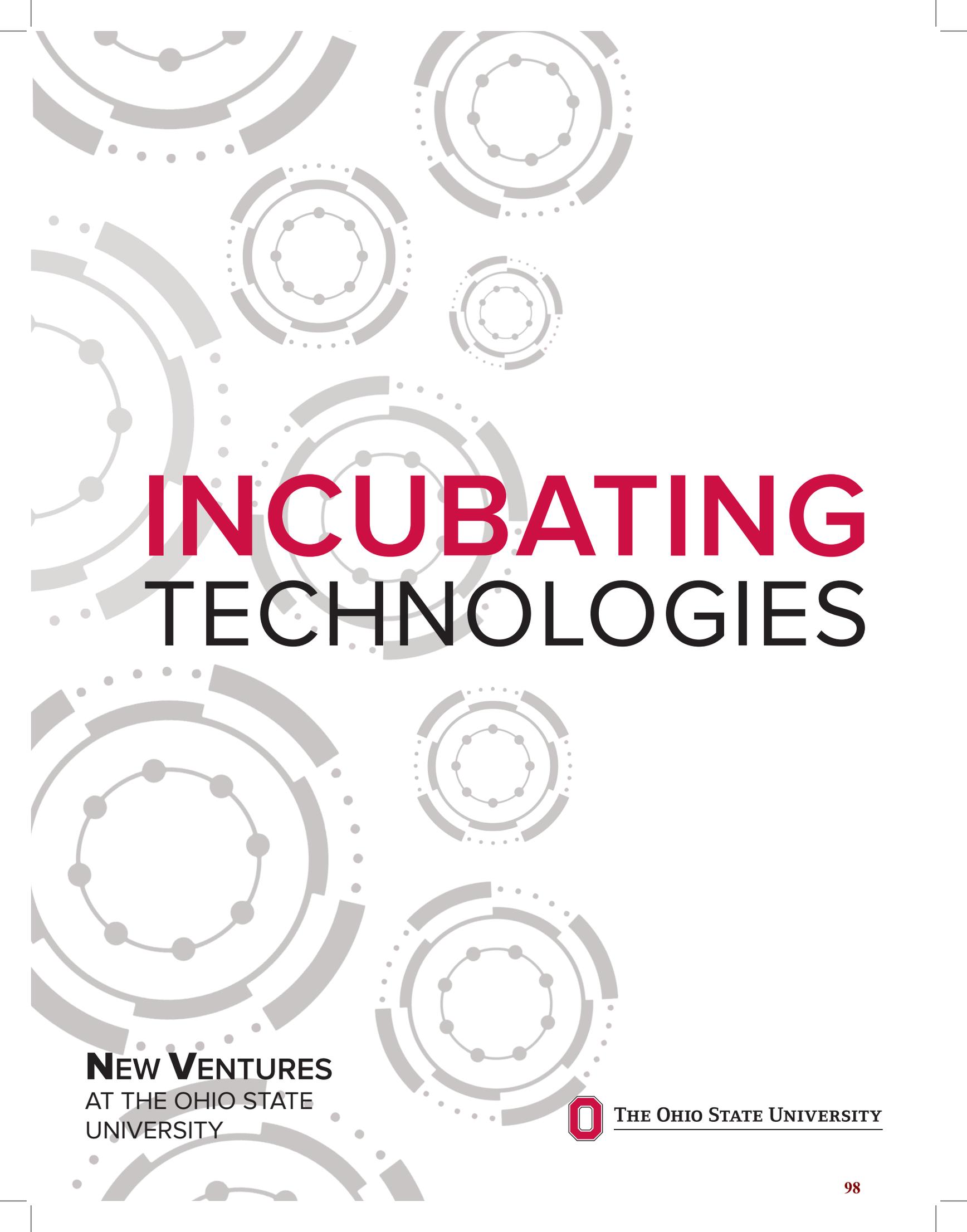
CEO: Jack Heavenridge





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# **OHIO STATE: INCUBATING TECHNOLOGIES**



# INCUBATING TECHNOLOGIES

**NEW VENTURES**  
AT THE OHIO STATE  
UNIVERSITY



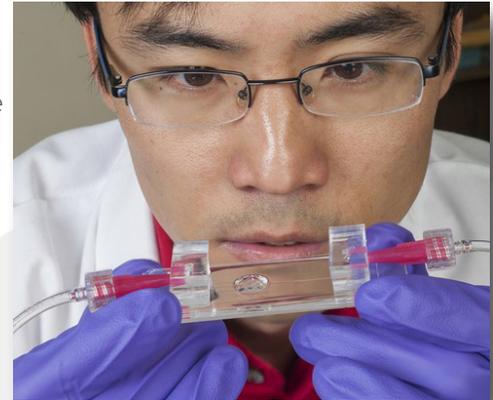
THE OHIO STATE UNIVERSITY

# Innovation at The Ohio State University

The Ohio State University supports creativity, innovation, commercialization, and entrepreneurship as essential components of an academic research institution and crucial factors needed to accomplish the mission of a land-grant university.

Ohio State's research and academic programs exhibit a tremendous breadth and depth. Recognized for academic performance, research collaborations, a top-rated medical center, a premier cancer hospital, and a state-of-the-art heart hospital, the university is a leader among institutions of higher education.

Ohio State ranks 3rd nationally among all research universities in industry-sponsored research, according to statistics compiled by the National Science Foundation. The scope and excellence of research programs make Ohio State a leading force of innovation and change — locally, nationally, and globally.



## Licensing to Startups

One path to commercializing a technology is licensing it to a newly formed company. Startups provide essential development flexibility to early-stage technologies needing refinement prior to entering the marketplace.

The technologies featured as incubating technologies are the innovations with high start-up company potential in various stages. Many of these technologies need qualified business leads to move them further along the commercialization pathway into a start-up company. More and more entrepreneurs are connecting with the university as many resources now exist to provide support for companies formed around Ohio State technologies both within the university and the central Ohio community.

## Ohio State Innovation Foundation

The Ohio State Innovation Foundation (OSIF) is a not-for-profit Ohio corporation formed in 2013 to hold, manage, and facilitate commercialization of the university's intellectual property.

## Startups by the Numbers



**PORTFOLIO  
COMPANIES**



**CREATED IN  
2013 - 2016**



**FUNDING  
RAISED**

## Startup Company Support Services

### Rev1 Ventures

Ohio State works with Rev1 to help entrepreneurs in the region build great companies. Rev1's team of experts leads an ongoing, data-driven process that ensures entrepreneurs develop products that people want and companies that people need.



### Validation

#### Rev1's Concept Academy

Concept Academy is designed to help entrepreneurs validate their concepts and focus on features that are of greatest interest to end users, before spending time and money on manufacturing and marketing.

#### Customer Aligned Startup Training (CAST)

Technologies chosen by the TCO for CAST (Customer Aligned Startup Training) undergo considerable customer validation. Over the course of fifteen weeks, students conduct market research on a particular technology of their choosing. At the end of the semester, CAST students present their findings and recommendations.

### Networking

#### First Connect Network

First Connect helps startups secure expertise in four critical areas to mitigate risk and accelerate milestones, especially during companies' critical first six months.

- Connecting entrepreneurs with their first strategic advisors.
- Linking entrepreneurs to their first group of industry experts.
- Helping entrepreneurs find their first customers.
- Being a catalyst for talent.

#### Ohio State Startup Leader Dinner

Established for all of Ohio State's licensees, this dinner for startup leaders provides the chance to share best practices, create a community, and foster growth of university startups.

#### Startup Snapshot

Startup Snapshot is a chance for entrepreneurs, investors, and inventors to interact, connect, and preview Ohio State's startup portfolio. Inventors and entrepreneurs present brief overviews of their technologies, followed by a networking session.



## Ohio State Incubating Technologies

Startups are categorized by the Discovery Themes:



Health and  
Wellness



Data  
Analytics



Energy and  
Environment



Humanities  
and Arts



Food and  
Safety

### Health and Wellness



#### Buckeye Contact Lens

Presbyopia – difficulty focusing on nearby objects – occurs in everyone over the age of 45, often necessitating the need for bifocals. Currently, true bifocal lenses are available as glasses and as hard contacts, but neither of these is an optimal solution. Buckeye contact lenses, developed by Dr. Melissa Bailey, are soft contacts with innovative design features that comfortably and effectively provide correction for presbyopia.

Ask: Qualified Business Lead  
College of Optometry  
Inventor: Melissa Bailey; Joseph Barr  
Stage: Early Prototype  
Commercialization Funding: \$10,000



#### Probo-shield

Salmonella is the number one cause of death from food-borne infections in the United States. An Ohio State research group has engineered new probiotic bacteria that protect against salmonella infection. These probiotics could be administered to livestock or companion animals for prevention/treatment of Salmonella or used by people as a daily nutritional supplement.

Ask: Qualified Business Lead with Regulatory Experience  
College of Medicine  
Inventors: Brian Ahmer, Anice Sabag-Daigle  
Stage: In Vivo Testing on Mouse Models



#### miRad

Radiation-induced lung injury is a common side effect of radiation treatments for cancer. Currently, this condition is detected by monitoring persons for symptoms and identifying injury with CT scans. This solution is ineffective because the risk becomes apparent only after injury has occurred, often times in the late stages of the disease. Dr. Jacob has developed a method to determine radiation levels via blood biomarker expression, making it possible to alter treatment prior to appearance of symptoms and progression of injury.

Ask: Qualified Business Lead  
College of Medicine  
Inventor: Naduparambil Jacob  
Stage: Pilot/Pre-Clinical with Future Research and Continued Funding  
Commercialization Funding: \$43,000

## Discovery Themes:



Health and  
Wellness



Data  
Analytics



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Environment



Humanities  
and Arts



Food and  
Safety



### PneumoCool

Pneumocool is a pneumatic, personal cooling device that uses low flow medical air to allow a patient to control air flow across his or her face. The flow of air activates the trigeminal nerve (the nerve that communicates sensations to the brain) and works to cool and calm the patient. This device, which is currently being used at the OSU Wexner Medical Center, is disposable (eliminating the potential to spread infection), bladeless and convenient.

Ask: Qualified Business Lead with Experience in Medical Devices  
Respiratory Therapy Department OSU Medical Center  
Inventors: James Bott, Ryan Hughes  
Stage: Clinical Trials  
Commercialization Funding: \$35,000



### Magnetic Resonance Elastography (MRE)

Magnetic Resonance Elastography (MRE) is becoming the industry-preferred method for assessing liver elasticity, an indicator of liver disease such as liver fibrosis. The Ohio State University MRE tissue vibration device generates high frequency vibrations, up to about 1000 Hz, and is designed for use in conjunction with an MRI scanner to generate 3D stiffness maps for the liver. This high frequency capability allows the device to penetrate deeper into tissue than current MRE technology and, in addition, extends device application beyond liver.

Ask: Qualified Business Lead with Experience in Medical Devices  
College of Medicine  
Inventors: Arunark Kolipaka, John Arnold, Francis Lee, Richard White  
Stage: 3rd Generation Prototype



### SPHERE

SPHERE enhances the communication, learning, and understanding process between patients and doctors via a health score visualization tool tethered to an electronic medical record. The tool uses validated health scoring algorithms for health promotion and disease prevention and management, so predictions and risk assessments can be as accurate as possible. Not only does this software display current health statistics, but it has the ability of visualizing- in real time- the impact of a change in behavior.

Ask: Qualified Business Lead with Experience in Healthcare IT  
College of Public Health  
Inventors: Randi Foraker, Marcelo Lopetegui  
Stage: Full Prototype, Tested in Four Clinics



### Lung Texture Score Calculator

Ohio State University researchers, led by pulmonologist Elliott Crouser, MD, have developed a computerized method to analyze chest CT scans to produce a quantitative measurement of lung disease severity, the Lung Texture Score (LTS). This tool enables more appropriate and effective therapeutic intervention than current, non-quantitative imaging protocols. Target lung diseases include idiopathic pulmonary fibrosis, emphysema and other diseases in the COPD grouping.

Ask: Qualified Business Lead  
College of Medicine  
Inventors: Selnur Erdal, Elliott Crouser  
Stage: Working Prototype

# Ohio State Incubating Technologies

## Discovery Themes:



Health and  
Wellness



Data  
Analytics



Energy and  
Environment



Humanities  
and Arts



Food and  
Safety



### SitSmart

Patients managing spinal cord injuries face unique problems with respect to wheelchair use. Specifically, their seated position puts them at risk for developing pressure ulcers without warning. A research team at The Ohio State University, led by Dr. Carmen DiGiovine and Dr. Sandra Metzler, designed a pressure-sensing device that may be positioned under a patient to detect and notify individuals of periods of consistent high pressure. In this way, patients can prevent pressure ulcer formation by alleviating pressure before symptoms present themselves. Audio cues will alert the patient of a potential issue in order to teach the user the timing of redistributing seating pressure.

Ask: Qualified Business Lead  
College of Engineering  
Inventors: Carmen DiGiovine, Sandra Metzler  
Stage: Prototype Iteration  
Commercialization Funding: \$25,500



### SmartHub

Fitness tracking technology has boomed in recent years. However, none of the technology that has been sold caters to individuals who use wheelchairs. Dr. Carmen Digiovine, Dr. Sandra Metzler, and their capstone team at The Ohio State University built a device that can track fitness metrics for wheelchair users (e.g. average push force, average push frequency, distance traveled, average velocity, and strokes per day), without having to replace any existing equipment on the wheelchair and without any outside assistance. This device is attached to existing wheelchairs and is less than 1% of a wheelchair's weight. It does not require a medical professional to read, unlike its competitor, and has a web based user interface which easily shows recorded data and can be sorted in a variety of ways.

Ask: Qualified Business Lead  
College of Engineering  
Inventors: Carmen DiGiovine, Sandra Metzler  
Stage: Prototype



### SMERT (Subject Matter Expert Refined Topic model)

SMERT is an analytical engine that can take millions of documents (like those available to the world wide web), social media posts, and/or images and identify the topics and the percentages of words or pixels related to each topic. These findings are presented as both quantitative and visual chart summaries. The engine allows the user to refine and accelerate the tagging of documents, social media, and images by using subject matter experts who annotate the topic definitions with minimal labor compared to other systems that rely on tagging the material with little or no outside data input.

Ask: Qualified Business Lead Familiar with Statistics and/or Machine Learning  
College of Engineering  
Inventors: Theodore Allen, Hui Xiong, Anthony Afful-Dadziec  
Stage: Alpha Prototype

## Discovery Themes:



Health and  
Wellness



Data  
Analytics



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Environment



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and Arts



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Safety



### Imager

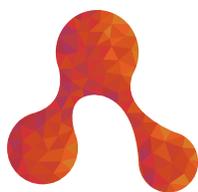
This perforator angiography technique fuses MRI phase contrast angiography images with an MRI anatomic data set to create a high resolution, flow-sensitive, preoperative perforator vessel imaging tool without patient exposure to ionizing radiation or any exogenous contrast media. The developed technique is a safe, robust, and effective perforator imaging methodology that provides an alternative to Computed Tomography Angiography (CTA) for preoperative imaging of deep inferior epigastric perforators (DIEP) for plastic surgery. Reconstructive surgery patients, especially overweight and obese patients, will benefit from this novel technique due to radiation dose elimination and image quality improvement.

Ask: Qualified Business Lead

College of Medicine

Inventors: Michael Knopp, Xiangyu Yang, Michael Miller

Stage: Mature Technology in Human Use at OSU



### Slim-It

Researchers at The Ohio State University, led by Dr. Ouilana Ziouzenkova, discovered a process of cellular engineering that allows the conversion of any fat cell into that of a thermogenic fat cell. Utilizing this approach as a novel obesity treatment, the basal metabolic rate can be dramatically increased. Benefits include: reduction of fat in specific fat depots; increase in basal metabolic rate leading to weight reduction; easily controllable number and function of implanted engineered cells; and engineered cells encapsulated in biocompatible polymeric membranes which does not elicit an immune response.

Ask: Qualified Business Lead

College of Education and Human Ecology

Inventor: Ouilana Ziouzenkova

Stage: Prototype Validation



### STAR

The Stress Trauma and Resilience (STAR) application is specifically designed to assist healthcare professionals cope and manage work related trauma.

Ask: Qualified Business Lead

College of Medicine

Inventor: Kenneth Yeager

Stage: Early Prototype



### Continuous Malaria Detection

Researchers at the Ohio State University, led by Dr. Vish Subramaniam, developed a novel electromagnetic device for the continuous detection of malaria. The device, non-invasively, detects the presence of the PF (*Plasmodium falciparum*) parasite by monitoring the electromagnetic properties of red blood cells flowing in the device's vicinity. The device is inexpensive to produce, provides quick results, and can be coupled with a simple display system to clearly indicate results without the need of specialized skills or equipment.

Ask: Qualified Business Lead

College of Engineering

Inventor: Vish Subramaniam

Stage: Proof of Concept Validated

Commercialization Funding: \$50,000

## Ohio State Incubating Technologies Discovery Themes:



Health and  
Wellness



Data  
Analytics



Energy and  
Environment



Humanities  
and Arts



Food and  
Safety



### **MRI Background Phase Corrector**

MRI Background Phase Corrector is a new data acquisition and processing method for accurate and robust correction of eddy current-induced background phase (EC-BP) in phase-contrast MRI. This EC-BP correction scheme uses multi-slice data processing and other novel techniques to provide an accurate, robust, and clinically usable solution to the inaccuracies in phase-contrast MRI volume flow measurement. The improved images are expected to have a significant impact on the non-invasive measurement of hemodynamics in areas including cardiac and vascular MRI.

Ask: Qualified Business Lead  
College of Engineering  
Inventors: Rizwan Ahmad, Orlando Simonetti, Ning Jin  
Stage: Proof of Principal, Established Software and Ongoing Validation



### **Get It RIGHT**

The key to addressing cancer is being aware of it at an early stage. Get It Right is a cancer screening application that helps potential patients understand the fundamental questions/information needed to correctly screen for cancer that include, the appropriate screening tests, what those tests involve, where to get the screenings, and how to talk to their doctor about the results.

Ask: Qualified Business Lead  
College of Medicine  
Inventors: Brittany Brewer, Electra Paskett, Sarah Reisinger  
Stage: iPhone Prototype



### **eRAMP**

The electronic Research Administration Management Program (eRAMP) is an extensible web-based .NET software application that can help businesses with order entry, fulfillment, and financial processing. The system primarily supports service centers and the objects the centers sell or services they provide. Users authenticate themselves, request objects from their choice of service centers, provide funding sources, and any special instructions needed for the request. It was developed for the Research Administration within the OSU Comprehensive Cancer Center and is adaptable to other order entry situations as well.

Ask: Qualified Business Lead  
OSU Wexner Medical Center  
Inventor: Michael R. Townsend  
Stage: Prototype in Use



### **Adaptive LC Lens**

To overcome the shortcomings of bifocal and trifocal lenses, the Adaptive LC Lens is a revolutionary approach to this vision problem by developing variable and uniform optical power across the whole lens area and high switching speed. In this case, the whole lens area can be used for each vision task and the power can be varied for different vision tasks.

Ask: Qualified Business Lead  
College of Medicine  
Inventor: Guoqiang Li  
Stage: Prototype  
Commercialization Funding: \$100,000

## Discovery Themes:



Health and  
Wellness



Data  
Analytics



Energy and  
Environment



Humanities  
and Arts



Food and  
Safety



### K-Space Optimizer

Radiofrequency (RF) field estimation is critical for various stages of the magnetic resonance imaging (MRI) procedure. The state of art methods of RF field estimation measure either magnitude or phase and are conducted only in the image domain and not in the k-space domain. This patent-pending invention describes systems and methods for estimating both magnitude and phase of the RF field in both image and k-space domains.

Ask: Qualified Business Lead  
College of Arts and Sciences  
Inventor: Jinghua Wang  
Stage: Prototype  
Commercialization Funding: \$29,600



### ProtectE

When undergoing a catheter ablation procedure for the treatment of atrial fibrillation, the patient is at risk for esophageal injury. While the incidence is small, such an injury is usually lethal. ProtectE protects the esophagus during afib ablation by atraumatically displacing the esophagus, moving it away from the energy/heating source of the ablation catheter. ProtectE is intended to be used much like the common nasogastric tube and its insertion and use does not require the presence of additional MD-level staff in the procedure suite.

Ask: Qualified Business Lead  
College of Medicine  
Inventor: Emile Daoud, MD  
Stage: Prototype and Clinical Trials  
Commercialization Funding: \$49,000



### A Novel Color Matching System for Translucent Dental Material

This color selection system was developed to select a shade that would produce the smallest color difference or best color match when given a target shade and backing. Optical characterization and analyses involved determination of absorption and scattering, translucency parameter, contrast ratio, and CIE L\*, a\*, and b\* for all shades of Herculite Ultra and Estelite Omega composite resins. This system was developed through incorporation of the optical characterization, Kubelka-Munk (K-M) layering, and regression modeling data. The component blending and layering effects within a color match and the consequences of these combined features on the accuracy of a color match were determined and quantified through analysis of a blending model.

Ask: Qualified Business Lead  
Dentistry | Restorative & Prosthetic Dentistry  
Inventors: Melody Carney & William Johnston  
Stage: The software is complete and proof of concept has been performed

## Ohio State Incubating Technologies Discovery Themes:



Health and  
Wellness



Data  
Analytics



Energy and  
Environment



Humanities  
and Arts



Food and  
Safety



### Autoscope

Ear infections, specifically acute infections of the middle ear (acute otitis media), are the most commonly treated childhood disease and account for approximately 20 million annual physician visits in the U.S. alone. The subjective nature of diagnosis results in a critical gap that needs to be addressed to improve diagnostic accuracy, by developing an objective method to assess the eardrum. Autoscope addresses this problem through a sophisticated software and hardware approach using today's mobile technology utilizing complex algorithms and patent-pending image analysis.

Ask: Qualified Business Lead

Medical | Medical Education

Inventors: Caglar Senaras, Aaron Moberly, Theodoros Teknos, Charles Elmaraghy, Nazhat Taj-Shaal, Lianbo Yu, Metin Gurcan

Stage: Patent Pending, Mid-way Prototype



### Neuro-GERGM

For patients presenting with head trauma (e.g. concussion), PTSD, Alzheimer's, and other neurodegenerative diseases, diagnostic tools like MRI can reveal anatomical disruption or damage, but often there is no or minimal anatomical disruption. However, there will be cognitive disruption, which cannot be rapidly or accurately quantified with the current standard of care. Researchers from the OSU Center for Cognitive and Behavioral Brain Imaging are leading a team that has developed the first system to rapidly quantitate the gap between normal and abnormal cognitive function. This enables the clinician to rapidly diagnose: 1) the degree of head trauma or 2) the severity of diseases provoking cognitive disruption. The physician can then initiate the most appropriate treatment plan.

Ask: Qualified Business Lead

College of Arts and Sciences

Inventors: Skyler Cranmer, Zhong-lin Lu

Stage: Early prototype with large library of patient imaging data for advanced development



### Fast IR Laser Probe

For cancer patients undergoing surgery for solid tumor resection, surgeons want to confirm intraoperatively and rapidly that they "got it all" to avoid re-ops. For clinic patients presenting with questionable (possibly cancerous) skin tissue, clinicians want to provide immediate "cancerous or not" confirmation without tissue resection. Researchers from the Dept. of Chemistry and the College of Medicine have prototyped a handheld infrared (IR) laser probe capable of detecting and characterizing cancerous tissue in seconds. The product vision, in part, is fast, less expensive, reliable, no-excision diagnosis of 3.3 million suspected skin cancers annually.

Ask: Qualified Business Lead

College of Medicine; College of Arts and Sciences

Inventor: Jim Coe

Stage: Prototype with proof of principle demonstrated on resected liver tissue

# Discovery Themes:



Health and  
Wellness



Data  
Analytics



Energy and  
Environment



Humanities  
and Arts



Food and  
Safety



## TAVI Planner

Trans-catheter heart valve implantation (TAVI) is the state-of-art therapy for aortic heart valve disease and is rapidly growing in use. However, due to the pre-existing complications, patients have been reported with cardiac arrest due to coronary obstruction during this procedure. TAVI Planner software includes a predictive model to screen patients for possible coronary obstruction during TAVI by acquiring the patient's pre-TAVI CT angiographic images. This will be used by surgeons to evaluate the procedure risk and will assist them in choosing the most suitable prosthetic heart valve for the patient.

Ask: Qualified Business Lead  
College of Medicine  
Inventor: Prasad Dasi  
Stage: Working Prototype



## Printed Electronic Dressing

6.5 million patients in the U.S. are affected by chronic wounds, which are often complicated by infection. These infections can be unresponsive to antibiotic treatment because of bacterial biofilms that are resistant to antimicrobics at levels 500-5000 times higher than those needed to kill non-biofilm bacteria. The Printed Electronic Dressing is an electrically conductive wound dressing with printed electrodes that utilizes direct current to prevent biofilm formation and/or disrupt pre-existing biofilms, resulting in improved wound healing outcomes. The dressing includes a unique self-powering feature.

Ask: Qualified Business Lead  
College of Medicine; College of Engineering  
Inventors: Shaurya Prakash; Vish Subramaniam; Chandan Sen  
Stage: Human studies to begin 4Q2016



# Ohio State Incubating Technologies

## Discovery Themes:



Health and  
Wellness



Data  
Analytics



Energy and  
Environment



Humanities  
and Arts



Food and  
Safety

## Data Analytics



### Gaze Tracking

The Gaze Tracking device receives synchronized data from commercially available eye and head trackers and relates this data to the location of a pitched ball. The device allows the user to specify where the head, the eye, and the sum of the head and eye (gaze) are located in relation to the pitched ball. Gaze Tracking could allow the user to obtain immediate feedback concerning eye and head movements, ultimately improving the users hitting and batting average.

Ask: Qualified Business Lead  
College of Optometry  
Inventor: Nicklaus Fogt  
Stage: Working Prototype with Initial Data



### Computed Tomography Elastography

Elastography is a noninvasive technique to estimate stiffness of soft tissue. Magnetic resonance elastography (MRE) and ultrasound elastography (UE) are used to diagnose or stage different diseases such as staging liver fibrosis or cancerous tumors based on target organ tissue stiffness estimates. However, MRE cannot be used to effectively evaluate hard tissues such as bone. UE is similarly limited. The OSU CTE system is the first to perform elastography using computed tomography (CT) imaging modalities rather than MRI or UE and can therefore be applied to hard structures in the body (such as bone, cartilage, and teeth), as well as soft tissues, in combination with high spatial and temporal resolution.

Ask: Qualified Business Lead  
College of Medicine  
Inventors: Arunark Kolipaka, Rick Layman, Richard D. White  
Stage: Concept



### Trellis

Trellis is a cloud-based application for greenhouse and plant growth facility management. The system integrates facility management tools such as project scheduling, pest management, maintenance, accounting, and communication logistics. This app provides comprehensive reporting on optimizing capacity, pests and pesticide usage, project administration and meets USDA and EPA labeling and record keeping compliance.

Ask: Qualified Business Lead  
College of Arts & Sciences  
Inventor: Joan Leonard  
Stage: Full Working Prototype with User Feedback

## Discovery Themes:



Health and  
Wellness



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Humanities  
and Arts



Food and  
Safety



### MIPAR

The Materials Image Processing and Automated Reconstruction (MIPAR) software is a comprehensive app suite that offers powerful, yet intuitive, applications for the processing, analysis, and visualization of 2D and 3D images. Through five integrated applications, MIPAR offers user-friendly environments for the different tasks performed during 2D and 3D image analysis. Developed by materials scientists, it is uniquely designed to offer workflows that are well-suited to solve a variety of scientific image analysis problems. For more information visit [MIPAR.us](http://MIPAR.us).

Ask: Qualified Business Lead  
College of Engineering  
Inventors: John Sosa, Hamish Fraser  
Stage: Validated Prototype with Active Paid Users



### VFA

The Vocational Fit Assessment (VFA) assists in better job matching, socioeconomic security, health, and quality of life for those with intellectual disabilities. VFA is a job matching calculation system that is designed to assess worker abilities, job demands, and identify the pros and cons of each potential job match. The technology is superior to the industry standard because it uses two different assessments, and compares the results to match the disabled candidate to the job position that suits him or her best, specific to the context of disability. The product has gone through extensive psychometric testing to demonstrate reliability, validity, and potential to benefit key stakeholders engaged in the job matching process.

Ask: Qualified Business Lead  
College of Medicine  
Inventors: Andrew Persch, Dennis Cleary  
Stage: Alpha Prototype Validated



### QPA

Traditional PCR-based methods for detection of nucleic acids for pathogen identification requires expensive laboratory equipment. Dr. Besik Kankia has developed QPA, an isothermal nucleic acid amplification platform that provides a fast, fluorescent readout that could dramatically improve in-field point-of-care diagnostics.

Ask: Qualified Business Lead  
College of Arts and Sciences  
Inventors: Besik Kankia  
Stage: Pilot

# Ohio State Incubating Technologies

## Discovery Themes:



Health and  
Wellness



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Analytics



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and Arts



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Safety



### Online Map Games for Teaching and Learning through a Real-World Spatial Perspective

A web based, multiplayer, educational game platform that combines satellite images, geographic information and gameplay to provide realworld simulations that give users a micro-experience of any place in the world. The fundamental innovation of the GeoGame platform is the ability to provide a modifiable, interactive game board that integrates a full range of GIS supported map and processing services with online multiplayer gaming affordances into an online map game/simulation environment. The game engine and the assessment components have been developed using advanced features of the Microsoft .NET framework (in particular the Windows Workflow Foundation rules engine for game rules and in combination with .NET interceptors for the eventdriven assessment questions).

Ask: Qualified Business Lead  
GIS | Location Gaming \ Education  
Inventors: Karl Ahlqvist, Andrew Heckler, Rajiv Ramnath  
Stage: Software is complete and ready to go to market



### Skillset Solver

Skill set solver identifies those skill set needs so they are approved by the employer and matches applicable training on demand. This frontend software creates the missing link by identifying needed skillsets and the courses that develop them, at specific job/carer levels or “rungs” within career “ladders”. Rather than identifying generic skills or purely technical skills, this software uses analytics and several sources of data (HR input, job descriptions, etc) to identify specific skills for that rung of a ladder and then offers up options for training. The advantage is relevancy and better training ROI plus ease of approval for education programs embedded in the system for the employer, and greater sales of the education programs presented by set Skill solver. With data analytics the software can track and report trends and results. This proprietary software creates a sticky front end for an educational service business and prevents price shopping due to the value add. It is envisioned either as a standalone software module or as part of a larger service that includes tiered levels of training and education from multiple sources sold on a subscription basis to employers.

Ask: Qualified Business Lead  
Business | Human Resources \ Management  
Inventor: Gretchen Goffe  
Stage: Concept, Ideation + Frameworks



### MedNet21

MedNet21, an OSU Center for Continuing Medical Education content management, learning management system for the facilitation of stage 1 accredited education for doctors and nurses to maintain their license. A library and software system comprised of over 200+ hours of digital media and video related content. 40 new programs are generated every year to serve both Ohio State Wexner Medical center and 36 hospitals in the US and boasts over 147 accounts worldwide. This is a digital content, and online software platform opportunity with existing significant customer engagement.

Ask: Qualified Business Lead  
Medical | Medical Education  
Inventors: Leisl Ashbaugh, Barbra Berry  
Stage: Software and content is complete and ready to go to market.

## Discovery Themes:



Health and  
Wellness



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Humanities  
and Arts



Food and  
Safety

## Energy and Environment



### UV Light Emitting Diodes

Newly designed Ultra Violet LEDs use quantum mechanical tunnelling to inject electrons, thus greatly enhancing the efficiency and dramatically lowering the power consumption of UV-LEDs. This revolutionary technology reduces the cost to the point that UV-LED could become a mainstream commodity, particularly for sterilization of medical devices, water, hospital rooms, and similar environments.

Ask: Qualified Business Lead

College of Engineering

Inventors: Siddharth Rajan, Sriram Krishnamoorthy, Yuewei Zhang

Stage: Working Prototype

Commercialization Funding: \$100,000



### Applied Impulse

The vaporizing foil actuator technology was developed to carry out impulse processes on a small scale, without the limitations of other impulse techniques. The technology has both system and method patents around it. An aluminum foil is electrically vaporized, causing high pressure to be exerted on the flyer, which in turn is used in the impulse metalworking. Using the technology in Dr. Daehn's portfolio the user can weld and join two dissimilar metals, form & emboss metals, and shear metals.

Ask: Qualified Business Lead

College of Engineering

Inventor: Glenn Daehn, Anupam Vivek

Stage: Prototype Completed

Commercialization Funding: \$100,000



### K-Air Battery

Researchers at The Ohio State University designed a novel anode, O<sub>2</sub>-blocking membrane, and electrolyte to create a potassium air battery that is mechanically strong and flexible, possesses high ionic conductivity, and can efficiently block oxygen crossover from the oxygen electrode to the anode. As a result, the innovative KO<sub>2</sub> battery eliminates the safety and stability issues of using potassium and vastly improves the cycle life performance of KO<sub>2</sub> batteries, which feature an energy supply that is in constant balance with energy demand; mitigating reliance on fossil fuels.

Ask: Qualified Business Lead

College of Arts & Sciences

Inventors: Yiying Wu, Xiaodi Ren

Stage: Prototype

## Ohio State Incubating Technologies Discovery Themes:



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Safety

### SMARTmembrane

#### Smart Membrane

Ionic conductivity through the smart membrane can be controlled by an applied electrical potential to the membrane. Using this property of the smart membrane, an architecture for an energy storage device for automotive applications with high energy density, specific power and rapid charging is demonstrated. This will enable a new category of energy storage devices different from today's batteries and supercapacitors for application in automobiles, UAVs, avionics and personal gadgets.

Ask: Qualified Business Lead

College of Engineering

Inventors: Vishnu Baba Sundaresan, Robert Northcutt, Vinithra Venugopal, Travis Hery

Stage: Prototype



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Environment



Humanities  
and Arts



Food and  
Safety

## Humanities and Arts



#### AutoCAD to Revit Model Converter

Revit models offer a completely different way of drafting designs that is useful in many professions. However, converting 2D AutoCAD models to 3D Revit models can be a difficult process for architects, engineers, designers, and contractors. This system, created by Ohio State researchers, is a simplified platform allowing users to quickly begin the process of converting existing AutoCAD based building into Revit based models. This converter saves users time and money since there are currently no books, guides, or other materials publically available on how to convert AutoCAD models to Revit models.

Ask: Qualified Business Lead

Administration and Planning

Inventors: Joseph Porostosky, David Pifher, Tracy Palmer

Stage: Beta Prototype in Production

## Discovery Themes:



Health and  
Wellness



Data  
Analytics



Energy and  
Environment



Humanities  
and Arts



Food and  
Safety

## Food and Safety



### POTS

The Pressure-Ohmic-Thermal Processing (POTP) technique creatively combines the benefit of high pressure along with ohmic heating to preserve extended shelf life products while providing healthy, nutritious foods with fresh quality attributes. Simultaneous application of pressure and ohmic heating enables control of thermal effects that can overcome limitations of other sterilization approaches to produce superior quality foods.

Ask: Qualified Business Lead  
College of Arts & Sciences  
Inventors: V.M. Balasubramaniam  
Stage: Prototype  
Commercialization Funding: \$49,000



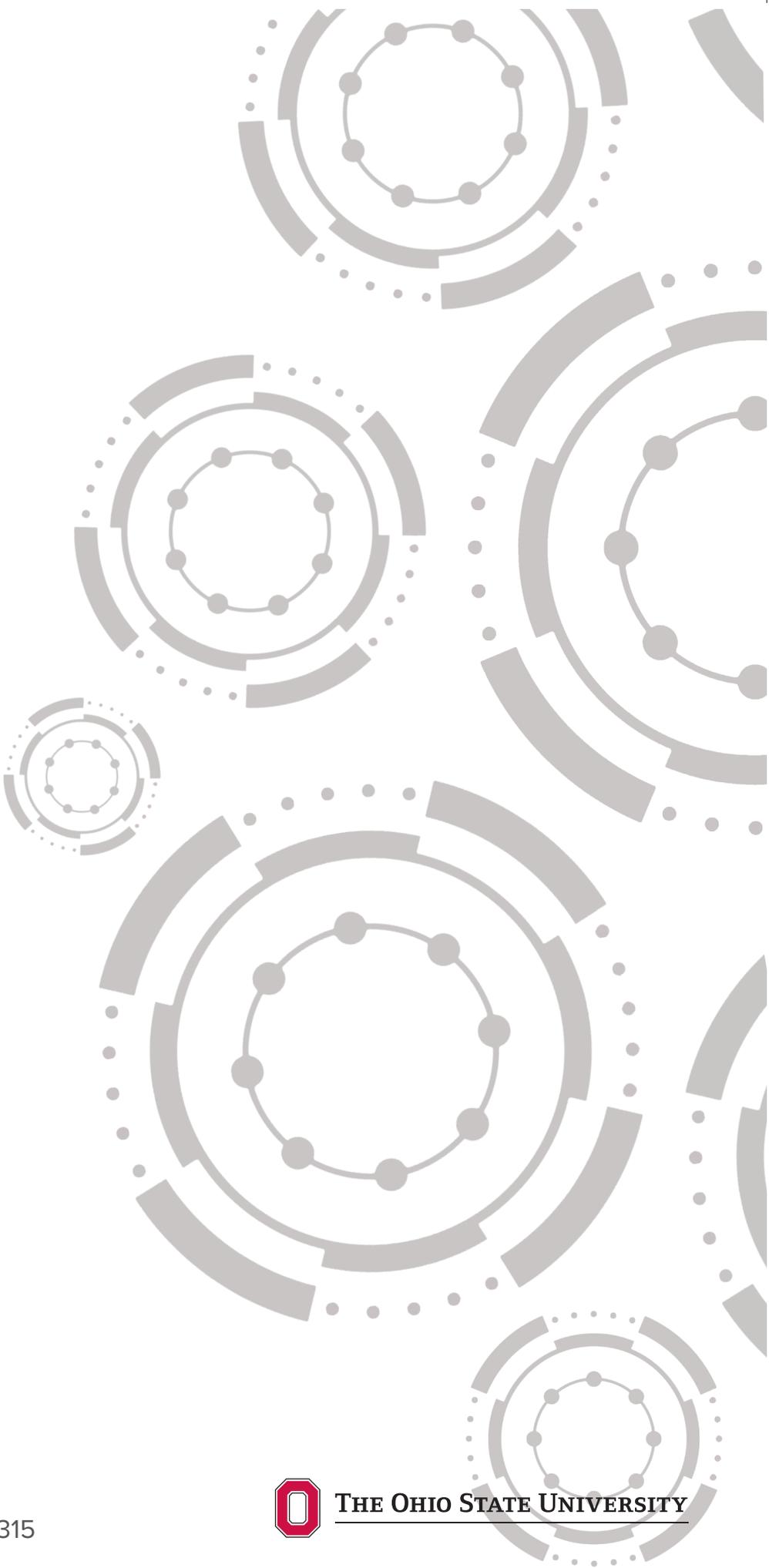
### Green Shelf Technologies

### Green Shelf Technologies

This suite of three antimicrobials can be added directly to food, used as natural replacements to artificial additives, and naturally produced by bacteria. Antimicrobials can be used as natural food additives to prevent a wide range of known foodborne pathogens and spoilage bacteria.

Ask: Qualified Business Lead  
College of Food, Agriculture, and Environmental Sciences  
Inventors: Ahmed Yousef  
Stage: Prototype Scaling





**FOR MORE INFORMATION:**  
VISIT: [tco.osu.edu](http://tco.osu.edu) CALL: 614.292.1315

# **THE OHIO STATE INNOVATION FUND**



**THE OHIO STATE  
UNIVERSITY**

Technology Commercialization  
Office

1524 N. High Street  
Columbus, OH 43201

614.292.1315  
tco.osu.edu  
innovation@osu.edu



OVERVIEW OF  
THE **OHIO STATE**  
INNOVATION  
**FOUNDATION**

AND ITS VARIOUS  
SUBSIDIARIES AND AFFILIATES

Technology Commercialization Office  
tco.osu.edu



**THE OHIO STATE UNIVERSITY**



# UNIVERSITY COMMITMENTS

## OHIO INNOVATION FUND

UNIVERSITY COMMITMENT: ..... \$20,000,000 (plus an additional \$2,000,000 reserved)

MANAGER: ..... OIF Management Co.

INVESTMENT COMMITTEE: ..... Geoff Chatas - *Ohio State rep.*

## DRIVE CAPITAL

UNIVERSITY COMMITMENT: ..... \$50,000,000

MANAGER: ..... Drive Capital management company

ADVISORY COMMITTEE: ..... Mike Papadakis - *Ohio State rep.*



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# OSIF MANAGED ENTITIES

Responsible for investing funds from the \$100 million economic development pool

## CARMEN INNOVATIONS, LLC

**PURPOSE:** ..... To make follow-on investments in OSIF portfolio companies

**UNIVERSITY FUNDING COMMITMENT:** ..... \$5 Million

**SOLE MEMBER:**..... The Ohio State University

**MANAGER:** ..... Ohio State Innovation Foundation

**OFFICERS:** ..... President – Matt McNair  
Secretary & Treasurer – Cheryl Turnbull



## NIT INNOVATIONS, LLC

**PURPOSE:** ..... To make investments in NIT companies on behalf of the university pursuant to the terms of the Strategic Capital Commitment agreement

**UNIVERSITY FUNDING COMMITMENT:** ..... \$10 Million

**SOLE MEMBER:**..... The Ohio State University

**MANAGER:** ..... Ohio State Innovation Foundation

**OFFICERS:** ..... President – Matt McNair  
Secretary & Treasurer – Cheryl Turnbull



**DIRECTORS:** OSU Chief Financial Officer ..... Geoff Chatas  
OSU Provost ..... Bruce McPheron  
OSU VP responsible for..... Matt McNair  
Technology Commercialization  
OSU representative appointed..... Mike Papadakis  
by OSU President (pending)  
Independent representative..... Tim Wright

**OFFICERS:** President ..... Matt McNair  
Vice President ..... DJ Nag  
Vice President ..... Cheryl Turnbull

**EMPLOYEES:** None

**OPERATIONS:** Governed by the First Amended and Restated Master Agreement dated February 5, 2014, between OSIF and The Ohio State University

# OHIO STATE INNOVATION FOUNDATION

## MISSION

- Manage intellectual property developed at, transferred to, or created by or for Ohio State and to facilitate the commercialization of such intellectual property;
- Promote research and development, including research and product innovations, development and commercialization, in support of Ohio industry, commerce and business;
- Encourage the creation or preservation of jobs or employment opportunities to improve the economic welfare of the people of the state of Ohio; and,
- Engage in other activities to support the public interest and promote purposes by Ohio State in connection with the commercialization of its intellectual property.



## ABOUT

All licenses and patents previously held by Ohio State were transferred to OSIF, and OSIF is the contracting entity for license agreements. OSIF engages with the Technology Commercialization Office to manage the Foundation - providing the people, offices, and supplies necessary to perform OSIF's mission and facilitate the entrance of Ohio State's innovations into the global marketplace.

# UNIVERSITY COMMITMENTS .....

## CONCEPT FUND

UNIVERSITY COMMITMENT: ..... \$500,000  
MANAGER: ..... Rev1 Ventures  
INVESTMENT COMMITTEE  
REPRESENTATIVE: ..... Cheryl Turnbull

## CATALYST FUND V

UNIVERSITY COMMITMENT: ..... \$2,000,000  
MANAGER: ..... Rev1 Ventures  
INVESTMENT COMMITTEE  
REPRESENTATIVE: ..... Geoff Chatas

## REV1 FUND

UNIVERSITY COMMITMENT: ..... \$2,000,000  
MANAGER: ..... Rev1 Ventures  
INVESTMENT COMMITTEE  
REPRESENTATIVE: ..... Cheryl Turnbull



# OSIF TECHSTARTS

## SCARLET INNOVATIONS, INC.

**PURPOSE:** ..... To hold membership interests in portfolio companies on behalf of OSIF

**SOLE SHAREHOLDER:** ..... Ohio State Innovation Foundation

**BOARD OF DIRECTORS:** ..... Matt McNair - University Rep.  
Tim Wright  
Matt McFarland

**OFFICERS:** ..... President – Cheryl Turnbull  
Secretary – Melanie Baker



## MEDCENTER EQUITY HOLDINGS, LLC

**PURPOSE:** ..... To hold the consortium interest in a purchasing cooperative on behalf of the medical center

**SOLE MEMBER:** ..... Ohio State Innovation Foundation

**BOARD OF MANAGERS:** ..... Dan Like  
Hal Mueller  
Pat Robertson

## BUCKEYE TECHNOLOGY VAULT, INC.

**PURPOSE:** ..... To commercialize digital assets on behalf of the university

**SOLE SHAREHOLDER:** ..... Ohio State Innovation Foundation

**BOARD OF DIRECTORS:** ..... Doug Spence  
Bill Forquer  
Hamish Fraser - University Rep.

**OFFICERS:** ..... President – Matt McNair  
Secretary & Treasurer – Cheryl Turnbull



# **OHIO THIRD FRONTIER: TVSF**

## Ohio Third Frontier Technology Validation and Start-Up Fund

### Calendar Year 2016 Request for Proposals (RFP)

- RFP Released – March 30, 2016
- Round 12:
  - Written Questions – accepted through June 16, 2016
  - Proposals - due by 2:00 PM, **June 23, 2016**
  - Awards – approximately October 2016
- Round 13:
  - Written Questions – accepted through December 8, 2016
  - Proposals - due by 2:00 PM, **December 15, 2016**
  - Awards – approximately Spring 2017
- Rounds 14, 15, and 16 will be covered under the CY 2017 RFP

**RFP Administered by:**

Ohio Development Services Agency  
Office of Small Business and Entrepreneurship  
77 South High Street, 28<sup>th</sup> Floor  
Columbus, OH 43215

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# Ohio Third Frontier Technology Validation and Start-Up Fund

## 1 Ohio Third Frontier Statement of Solicitation

### 1.1 Overview

The Technology Validation and Start-Up Fund (the “Program”) provides grants to transition technology from Ohio research institutions into the marketplace through Ohio start-up companies. Ohio research institutions may apply for funding for validation (e.g. viability testing, prototyping, etc.) of their unlicensed technologies. Ohio start-up companies may apply for funding to advance towards commercialization a technology they intend to license from an Ohio research institution.

### 1.2 Background

Created in 2002, the Ohio Third Frontier represents an unprecedented commitment to create new technology-based products, companies, industries and jobs in the State of Ohio. Today, the Ohio Third Frontier is innovation creating opportunity. The \$2.1 billion initiative's strategic intent is to create an "innovation ecosystem" that supports the efficient and seamless transition of great ideas from the laboratory to the marketplace.

The Ohio Third Frontier is successfully building an innovation economy with a commitment to:

- Produce a high level of economic return for the state in quality jobs, company growth and wealth creation
- Attract companies, talent and capital to Ohio
- Create sustainable engines of economic development activity in key areas of technology and industry strengths
- Reduce the risk of pursuing entrepreneurial, innovation and development activities in Ohio
- Sustain best practices and relationships that lead to efficient commercialization
- Increase the visibility and reputation of Ohio as an innovation and entrepreneurial destination

Ohio Third Frontier is committed to transforming Ohio's economy through the growth of startup and early stage technology companies. Businesses and entrepreneurs have access to a statewide network of resources through this nationally-recognized initiative. This network provides access to business expertise, mentorship, capital and talent to help turn great ideas into thriving companies and well-paying jobs.

What We Support:

Ohio Third Frontier seeks compelling business models for near-term market opportunities based on technology and tech-enabled products and services in the following areas of preference:

- Software/Information Technology
- Biomedical/Life Sciences
- Advanced Materials
- Sensors
- Energy
- Advanced Manufacturing

### 1.3 Request for Proposals Issuance

This Request for Proposals (“RFP”) is being issued for funds to be awarded under Ohio Third Frontier Technology Validation and Start-Up Fund. This RFP will be released by publication on the Ohio Third Frontier website at [http://development.ohio.gov/bs\\_thirdfrontier/tvsf.htm](http://development.ohio.gov/bs_thirdfrontier/tvsf.htm).

The Ohio Third Frontier Commission (“Commission”) reserves the right to fund any proposal in full or in part, to request additional information to assist in the review process, to reject any or all proposals responding to this RFP and to re-issue the RFP and accept new proposals if the Commission determines that doing so is in the best interests of the State of Ohio (“State”). Issuing this RFP does not bind the State to make an award of Ohio Third Frontier funds. Any award of Ohio Third Frontier funds in respect to this RFP will be subject to availability of funds as provided in Ohio Revised Code Section 126.07. This RFP is not a contract or commitment of any kind on behalf of the State or the Ohio Development Services Agency (“ODSA”).

ODSA administers this RFP and reserves the right to adjust any dates for this RFP for whatever reason it deems appropriate. ODSA’s Office of Small Business and Entrepreneurship will administer all funds awarded under this RFP.

### 1.4 The RFP Process and Awards Process

The RFP Process will consist of the following steps:

- Release of RFP
- Questions and Answers (Q&A) and Communications
- Submittal of Proposals

**Each of these steps is discussed in Appendix D – RFP Process, Awards Process and Mandatory Compliance.**

The Awards Process will consist of the following steps:

- Proposal Review and Evaluation Procedures
- Award Decision
- Award and Agreement Preparation and Execution

**Each of these steps is discussed in Appendix D – RFP Process, Awards Process and Mandatory Compliance.**

**All questions regarding this RFP must be submitted in writing via email to [TVSF@development.ohio.gov](mailto:TVSF@development.ohio.gov) with the subject line “TVSF Question”. Lead Applicants, Collaborators and/or others acting on their behalf are to be aware of all prohibited contact in Section IV of Appendix D. If a Lead Applicant, Collaborator and/or others acting on their behalf makes prohibited contact, ODSA in its discretion may subject the Proposal to elimination from the RFP process.**

**A template/sample grant agreement will be available on the Program’s website: [http://development.ohio.gov/bs\\_thirdfrontier/tvsf.htm](http://development.ohio.gov/bs_thirdfrontier/tvsf.htm)**

## 2 Program Description

### 2.1 Purpose and Goals

The goal of the Ohio Third Frontier Technology Validation and Start-Up Fund is to create greater economic growth in Ohio through start-up companies that commercialize technologies developed by Ohio institutions of higher education, other Ohio not-for-profit research institutions and federal labs located in Ohio (“Eligible Institution”).

The Program has been designed to: 1) Support protected technologies developed at Eligible Institutions that need known validation/proof that will directly impact and enhance both their commercial viability and ability to support a start-up company and 2) Support Ohio start-up and young companies that have not yet, but intend to license validated/proven technologies from these Eligible Institutions, and have already engaged with the Eligible Institution in a due diligence discussion for doing so.

Three separate mechanisms, with different application requirements, have been set up to achieve these goals: Technology Validation (Phase 1, Track A and Track B) and Start-Up Funds (Phase 2).

**Phase 1 – Technology Validation:** There are two tracks for Phase 1: Track A enables project-specific funding, as per previous rounds of the Program, and Track B enables the creation of a pool of funds that will in turn support various validation projects originating from an Eligible Institution. The specific objectives of this phase are as follows:

- Generate the proof needed to move technology to the point that it is either ready to be licensed by an Ohio start-up company or otherwise deemed unfeasible for commercialization. Track A applicants are encouraged, prior to application to the Program, to work with potential Ohio licensees to identify the proof needed.
- Perform validation activities such as prototyping, demonstration and assessment of critical failure points in subsequent development, scale-up and commercialization in order to generate this proof, with strong preference for these validation activities being performed by an independent source.

**Phase 2 – Start-Up Funds:** The specific objectives of this phase are as follows:

- Support Ohio start-up companies that intend to license technology developed at Eligible Institutions during the critical early stage life of the company, and accelerate the commercialization of this technology.
- Generate the proof needed to move technology to the point where additional funds for commercialization can be raised, or commercialize the technology. The Lead Applicant (defined in [section 2.2](#) below) is encouraged to have a clearly identified path to subsequent funding opportunities, and, if possible, work directly with potential investors to identify the proof needed for investment into the company.
- Fund activities including but not limited to beta prototype development and deployment to potential customers for testing and evaluation, and market research/business development in order to generate the proof needed.

### 2.2 Lead Applicant Eligibility

A Lead Applicant is the entity that submits a proposal and will be legally and financially responsible for the administration of any resulting award of Ohio Third Frontier Funds (“Lead Applicant”). The

Lead Applicant will be responsible for the administration of its proposal should it be awarded. The Lead Applicant must also serve as both the administrative and technical director of the Project.

### Phase 1 – Technology Validation

An eligible Lead Applicant for the Phase 1 Technology Validation Fund must be:

- 1) An Ohio institution of higher education; or
- 2) An Ohio not-for-profit research institution,
  - which has a history of technology commercialization and creation of start-ups; and
  - institutional infrastructure and support for commercialization.

Eligible Lead Applicants must have a dedicated Technology Transfer Office.

Eligible Lead Applicants may submit a proposal to either Track A (projects) or Track B (pool of funds), but not both. Eligible Lead Applicants may submit no more than **six Track A** or **one Track B** proposals in a round.

For Track A, the Lead Applicant's Technology Transfer Office must screen, select and submit proposals that represent only the very best commercialization start-up opportunities at that institution.

For Track B, an Eligible Institution may only have one Track B award in place at a time. If an Eligible Institution is awarded a Track B award, then that Eligible Institution will be **ineligible** to submit Phase 1 proposals (Track A or B) to the Program that would overlap the Track B award's Project Period (as defined in [section 2.5](#) and more specifically in the grant agreement).

In all cases, Phase 1 funding may not be used for a technology after Phase 2 funding for that same technology has been awarded.

### Phase 2 – Start-Up Funds

Eligible Lead Applicants for the Phase 2 Start-up Funds are Ohio start-ups and young, emerging Ohio companies that have not yet, but intend to execute--within nine months after the date of submittal of their Phase 2 application—an exclusive license with the owner of the technology that has been developed at an Ohio institution of higher education, an eligible Ohio not-for-profit research institutions as defined in Phase 1 or at a federal lab located in Ohio. **The technology being licensed must have been developed at the eligible institution and not previously licensed by the Lead Applicant.**

The technology does not need to have been the subject of a Phase 1 Award to be eligible for Phase 2 funding. However, if a technology received Phase 1 funding, that project must be complete with affirmative results before Phase 2 funding can be applied for. See [section 3.7](#) for additional instructions for pursuing a Phase 2 application based on previous Phase 1 funding.

The Lead Applicant must be an Ohio for-profit company with a principle place of business in the State and a strategy and business plan that has it remaining in the State. A principal place of business is a facility located in the State where the Lead Applicant, who is registered with the Secretary of State to conduct business in the State, maintains physical operations, and those physical operations are managed by a senior representative of the Lead Applicant who is authorized to make decisions and to obligate the Lead Applicant and its resources. Benefits from commercialization of the technology must occur in the State.

A Phase 2 Lead Applicant may apply no more than three times—this restriction would include their initial proposal as well as up to two revised submissions if unsuccessful. A proposal being submitted for the second or third time is considered a revised proposal and the appropriate box must be checked in the application forms.

**In order to submit a revised proposal (Phase 1 or Phase 2), the Lead Applicant must participate in a debrief call with ODSA staff and/or the program evaluators.**

A Lead Applicant that becomes a Grantee must maintain eligibility while the grant is open. A Grantee that loses eligibility forfeits its award and may be required to repay the State the full amount of the monies it has received under the award, plus interest.

### **2.3 Stage of Development of Eligible Technologies**

To be considered eligible for Program funds, a technology must already have, at the time of application to the Program or to an Institution's Track B pool of funds, intellectual property protection, defined as patent-pending, patent-issued, or copyright, as appropriate. It is expected the majority of technology will be patent-pending, which may include provisional patents. Program funds are not meant to be early stage "proof of concept" funds—projects supported by the Program must have already advanced beyond basic research and should have the equivalent of a laboratory-scale proof of concept prior to application to the Program.

### **2.4 Funding and Cost Share**

ODSA anticipates awarding up to \$5 million over the two rounds covered by this RFP.

#### Phase 1: Track A (Projects)

- Phase 1: Track A awards may be up to \$50,000 for each proposed technology. Each Phase 1: Track A award requires a cash cost share commitment of at least one dollar for every dollar of Program funds requested (i.e., a ratio of 1:1) and must represent a specific new unrestricted cash commitment to the Project. Each expense incurred through the validation/proof process must be paid on a pari passu basis in that the expense must be shared equally across Program funds and cost share. Allowable expenses must be 1) incurred to perform activities in direct support of the Project during the Project Period; 2) charged to resources of Grantee; and 3) documented in Grant accounts or in the Grant-related financial books and records. It will be the responsibility of the Lead Applicant to insure that the 1:1 cost share requirement is met or exceeded and all reporting requirements are met. Cost share must be available with no contingencies or conditions at the time of Proposal submission to ODSA.
- In order to better achieve the strong preference for validation activities to be performed by an independent 3<sup>rd</sup> party source, Phase 1: Track A Projects may allocate no more than 25% of their requested Program funds to Lead Applicant personnel costs.
- The Commission recognizes that the I-Corps@Ohio program can greatly improve the quality of a given project and improve its probability of success. Therefore, to better align with that program and better leverage its impact, technologies/teams that have successfully completed the I-Corps@Ohio program may apply for up to \$75,000 of Program funds. These projects require a cash cost share commitment of at least one dollar for every three dollars of Program funds requested (i.e., a ratio of 1:3) and must represent a specific new

unrestricted cash commitment to the Project. Except for the pari passu requirement, the cost share rules and conditions described for other Phase 1: Track A projects still apply.

#### Phase 1: Track B (Pool of Funds)

- A Lead Applicant's Phase 1: Track B proposal may seek Program funding in the range of \$200,000 to \$500,000 that would result in a total pool of funds of \$400,000 to \$1,000,000.
- Each Phase 1: Track B award requires a cash cost share commitment of at least one dollar for every dollar of Program funds requested (i.e., a ratio of 1:1) and must represent a specific new unrestricted cash commitment. It will be the responsibility of the Lead Applicant to insure that the 1:1 cost share requirement is met or exceeded and all reporting requirements are met. Cost share must be available with no contingencies or conditions at the time of proposal submission to ODSA.
- Because Phase 1: Track B Awards are intended to be matched directly by actual cash that will then be allocated to individual technology validation projects, cost share for these proposals cannot come in the form of researcher release time, student tuition remission, or any other seemingly "in-kind" types of support.
- Individual projects that an Eligible Institution decides to support with its Track B pool of funds must be supported equally across cost share and Program funds (i.e., 1:1). Unlike Track A, the expenses associated with a project supported by an Eligible Institution's Track B pool of funds need not be paid on a pari passu basis. In recognition of the value provided by the I-Corps@Ohio program, when an Eligible Institution decides to support a project based around a technology/team that has successfully completed the I-Corps@Ohio program, up to \$100,000 of the project may be supported using a 1:3 ratio of cost share to Program funds, meaning a cash cost share commitment of at least one dollar for every three dollars of Program funds (i.e., \$25,000 cost share/\$75,000 Program funds). Any project costs beyond \$100,000 must be paid for equally across cost share and Program funds (i.e., 1:1).
- Individual projects supported by an Eligible Institution with its Track B pool of funds are intended to be similar in scope to Track A projects, although greater flexibility is afforded to the Eligible Institution in the duration and amounts for individual projects. ODSA staff must approve projects prior to their support from a Track B pool of funds. Seeking approval will require a letter and 1-page project prospectus, the form of which will be determined by ODSA. Projects that exceed \$150,000 in total budget will require additional steps for approval.
- For individual projects to be supported by a Track B pool of funds, funds must be: 1) allocated during the Track B's Project Period, 2) for the performance of activities in direct support of the project, 3) charged to resources of Grantee, and 4) documented in grant accounts or in the grant-related financial books and records.

#### Phase 2 – Start-Up Funds

- The Start-up Fund awards (Phase 2) may be up to \$100,000 for each Project. Because Biomedical technologies are of great priority to Ohio Third Frontier and these projects typically require greater resources, a Phase 2 award for a proposal relating to Biomedical technology may be up to \$150,000.

- Cost share is not required for Phase 2 awards, but the uses of funds are restricted as described in [section 3.5](#). **An exclusive license agreement must be executed with the owner of the technology before a grant agreement is executed with ODSA and Program funds are disbursed. A copy of the signed, executed license agreement must be provided to ODSA within nine months of the date of application submittal for Phase 2 funding.**

**For both Phase 1 and Phase 2**, no portion of Program funds may be used to provide bonuses, incentive compensation or rewards. Funds awarded under the Program may not be used toward travel expenses. The budget line items in the application forms are the only types of reimbursable expenses. Additional information regarding allowable and unallowable expenses can be found in [section 3.5](#).

## 2.5 Term of Project Period

A Project is the plan of activity or activities that make up the total scope of work for which an award of Program funds is being requested and for which a proposal is approved (“Project”). The Project Period is the period during which the work funded by the Grant will take place and will be one year for either Phase 1 or Phase 2 (“Project Period”). There will be no extensions to the Project Period for Phase 1: Track B awards. Requests for extensions for other awards will be reviewed on a case-by-case basis and will generally not exceed 6 months in length. Following the Project Period, for an additional three years of the grant, the Lead Applicant will continue to follow and report commercialization successes to ODSA.

## 3 General Proposal Requirements

### 3.1 General Instructions

**Program proposals must be submitted via ODSA’s online proposal submission portal. The link for the portal is on the [TVSF Program Website](#).**

**If the portal is unavailable, proposals are to be submitted via email to [TVSF@development.ohio.gov](mailto:TVSF@development.ohio.gov).**

Proposals must use the questions provided in the appropriate appendix ([Appendix A](#) for Phase 1: Track A, [Appendix B](#) for Phase 1: Track B, or [Appendix C](#) for Phase 2) for their proposal narrative. No other materials other than what is requested in those appendices may be submitted.

Regarding formatting for all proposals submitted to the program,

- Proposals are to be submitted on 8.5 x 11-inch paper.
- Margins must not be less than  $\frac{3}{4}$  of an inch on all sides, with the exception of forms found in the Appendices.
- Font must be 11 point or larger with no more than 6 lines per inch.
- All pages must be numbered consecutively using the format “Page [#] of [total number of pages]” (e.g., Page 2 of 10).
- The proposal title and Lead Applicant name must appear at the bottom of each page.

- Proposals should not include color figures that cannot be understood when photocopied in black and white.
- The first page of the proposal must be the Application Information Page found in Appendix A, B, C as appropriate.
- Do not include a cover or cover letter other than the Application Information Page.

### 3.2 Trade Secret Information

All Lead Applicants are strongly discouraged from including any information that the Lead Applicant considers a “trade secret,” as that term is defined in Section 1333.61(D) of the Ohio Revised Code, in a proposal. All information submitted in response to this RFP is public information unless a statutory exception exists that exempts it from public release under the Ohio Public Records Act in Section 149.43 of the Ohio Revised Code. If any information in the proposal is to be treated as a trade secret, the proposal must:

- Identify each and every occurrence of the information within the proposal with an asterisk before and after each line containing trade secret information and underline the trade secret information itself;
- Check the “This Application does include information considered a ‘trade secret’” box on the Applicant Information Page (see appendix); and
- Include a summary page immediately after the Application Information Page that lists each page in the proposal that includes trade secret information and the number of occurrences of trade secret information on that page.

To determine what qualifies as trade secret information, refer to the definition of “trade secret” in the Ohio Revised Code at 1333.61(D), which is reproduced below for reference:

(D) “Trade Secret” means information, including the whole or any portion or phase of any scientific or technical information, design, process, procedure, formula, pattern, compilation, program, device, method, technique, or improvement, or any business information or plans, financial information, or listing of names, addresses, or telephone numbers, that satisfies both of the following:

- (1) It derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use.
- (2) It is the subject of efforts that are reasonable under the circumstances to maintain its secrecy.

ODSA requires non-disclosure agreements from all non-ODSA persons who may have access to proposals containing trade secret information, including evaluators.

### **3.3 Applicant Information Page**

The first page of the proposal must be the completed Applicant Information Page, which must contain the title and signature of the Lead Applicant's Authorizing Agent. For a Phase 1 application (either Track), the Authorizing Agent will be the Technology Transfer Office. For a Phase 2 application, the Authorizing Agent will be the company.

### **3.4 Proposal Narrative**

Applications, using the questions provided in the appendices, are limited to six pages. Suggestions on space allocations per question are provided. However, applicants can allocate the six pages as they feel best presents the opportunity. Applicants should carefully examine [section 4](#) of this RFP to understand the evaluation criteria to best use their available space. With the short page limit, the Proposal narrative is not expected to be an in-depth technical assessment of the problem and the work plan.

### **3.5 Budget**

Indirect costs, legal fees, or patent prosecution expenses are not allowed as part of the budget request for either Phase 1 or Phase 2. Indirect costs are costs incurred for common or joint objectives and therefore cannot be identified readily and specifically with a particular sponsored project but nevertheless are necessary to the operation of the organization. These costs are also known as "Facilities & Administrative (F&A) costs". Costs incurred to develop a proposal or administer an award are not reimbursable. Travel expenses are also not allowed.

Phase 1: Track A proposals may allocate no more than 25% of the total project budget to Lead Applicant personnel costs.

Phase 2 proposals have further restrictions in that no Program funds may be used for Lead Applicant personnel costs, licensing fees, royalties or sponsored research.

### **3.6 Project Selection Committee (Phase 1: Track B)**

A critical element for the success of a Phase 1: Track B pool of funds is the membership of the project selection committee. As a part of the proposal narrative (see Appendix B, Question 5), Phase 1: Track B proposals must specify the membership of their selection committee. To enable a pool of funds the best chance at success, the following rules shall apply to the membership:

- A majority of the project selection committee may not be employed or otherwise affiliated with the Lead Applicant. Only one seat of the committee may be occupied by an executive (President, Vice President or similarly situated) from the Lead Applicant. Instances where the Lead Applicant has only one or zero seats on the committee will be viewed favorably.
- At least one member of the selection committee must be a representative from the local ESP (see [section 3.9](#)).
- At least one member of the committee must be a representative from an outside angel or venture capital interest.

As a whole, the project selection committee should encompass significant start-up expertise and appropriate linkages (including to industry sectors and possibly alumni) that would enable the recruitment of strategic partners and qualified entrepreneurs to move successful projects to the next level of commercialization. Lead Applicants are strongly encouraged to avoid using boiler plate biographical information to describe the selection committee members.

### **3.7 Summary of Previous Phase 1 Award(s)**

#### Phase 2:

If a technology received Phase 1 funding (either directly through Track A or through application to an Eligible Institution's Track B pool of funds), that project must be complete with affirmative results before Phase 2 can be applied for. The Phase 2 application must include a summary of the prior project, including project-specific metrics that indicate successful completion of the project and a description of the validation/proof process employed. This summary is not to exceed one page and is not considered part of the proposal narrative in terms of page limitations.

#### Phase 1: Track B

Most Eligible Institutions applying for Phase 1: Track B will have previously received Phase 1 awards. When this is the case, the Track B proposal must include a summary of those awards. A table is provided in Appendix B that must be utilized in the summary. Including this table, the summary is not to exceed one page and is not considered part of the proposal narrative in terms of page limitations.

### **3.8 Letters of Support**

Letters of Support are not permitted as part of a proposal to any phase of the Program, except as set forth in this RFP.

Each application under Phase 1: Track A must contain a letter from the Technology Transfer Office attesting that the technology has been reviewed and selected by the Technology Transfer Office as among the best start-up opportunities from the Eligible Institution. This letter shall not exceed one page.

Each application under Phase 2 must contain a letter from the Technology Transfer Office attesting that it is working with the Lead Applicant on a prospective license. The status of the negotiation and similar pertinent information should be included. This letter shall not exceed one page.

Phase 1: Track B (pool of funds) proposals must include a letter of support from any organization or individual that will have a seat on its project selection committee. These letters shall not exceed one page in length and should clearly establish the relationship between the organization or individual with the Eligible Institution, their commitment to the selection process and how their involvement critically helps the selection of technologies for support. The Lead Applicant should only submit a single letter that will describe its cost share commitment and the rationale for any of its employees that will have seats on the selection committee. For the cost share commitment, the letter must specify the amount, source (beyond just the name of the Lead Applicant), and verification that the cost share is fully available without any associated contingencies.

Lead Applicants are encouraged to utilize the allowable letter(s) of support to enhance their proposal as opposed to including simple form letters that provide little insight.

### 3.9 Engagement with the Entrepreneurial Ecosystem

The Ohio Third Frontier has made significant investment into fostering a statewide entrepreneurial ecosystem. This investment is particularly visible in the [Entrepreneurial Signature Program \(ESP\)](#)-- a statewide network of regionally-based organizations designed to provide services and capital to help entrepreneurs with a start-up technology company accelerate their growth and get their ideas to market. Each of the six regions of the State has a lead organization that, along with its extensive collaborator network, provides services including:

- Mentorship by seasoned entrepreneurs and industry professionals
- Help with business planning and investment pitch preparation
- Access to investors and capital
- Business support including legal, tax and accounting services
- Assistance developing intellectual property and marketing/sales strategies
- Help recruiting talent
- State-of-the-art workspaces at incubators

It is critical that while developing their TVSF proposal, Phase 2 applicants engage with the appropriate regional ESP (contacts can be found at [http://development.ohio.gov/bs\\_thirdfrontier/esp.htm](http://development.ohio.gov/bs_thirdfrontier/esp.htm)). The level and type/s of engagement must be detailed in response to the appropriate question in any Phase 2 proposal. Representatives from the regional ESPs may be contacted to verify the level and type/s of engagement.

Engagement with the local ESP is similarly critical for applicants to Phase 1 (Track B). Proposals for a pool of funds will need to specify a project selection committee that includes one representative from the local ESP.

### 3.10 Page Limitations

Any pages beyond the page limit listed below will be eliminated from the proposal before it is sent for review and evaluation and may also cause the proposal to be eliminated from consideration. Except as otherwise noted, appendices or other methods to augment the information presented in the proposal are not allowed. Reference to web-based information to supplement the proposal is not permitted, and such references will not be considered in the evaluation.

- Proposal narrative using the provided questions – six pages
- Letters of Support:
  - Letter of Support from Technology Transfer Office (Phase 1: Track A and Phase 2) – one page
  - Letters of Support for an Eligible Institution’s Project Selection Committee (Phase 1: Track B only) – one page each
- Summary of Previous Phase 1 Award(s) – one page, if applicable (Phase 1: Track B and Phase 2 only)

## 4 Evaluation Criteria

Only the most meritorious proposals are sought for funding. Proposals will be evaluated based on responsiveness to all the requirements of this RFP. Implicit in those requirements and evaluation criteria is the quality of the statement of work and budget.

The following criteria have been designated with the highest relevance to and weighting for the Technology Validation and Start-Up Fund:

- Alignment of the proposal with the Technology Validation and Start-Up Fund purpose, goals, objectives, eligibility and funding requirements as described in this RFP.
- Compliance with this RFP's administrative requirements.
- Quality of the responses to the requirements of this RFP as outlined in the proposal narrative. The following specific elements will be examined:

### **Phase 1: Track A – Technology Validation Projects**

- Proposed proof needed to move the technology to a point where it is ready to be licensed to a start-up or young company is deemed meaningful and likely impactful to that end.
- Proposed proof can be generated during the one-year Project Period and with the proposed resources.
- Strong preference will be given to applications whose validation/proof process will be conducted or overseen by an independent 3<sup>rd</sup> party.
- Application of technology has commercially reasonable path to market entry of first product.
- Degree to which the intellectual property is protected and will protect the expected business model of a start-up company.
- Degree to which the proposed Project will likely lead to a start-up company if the technology validation is successful and needed proof is generated.
- Commercial opportunity including size of potential market.
- Completeness of budget narrative and appropriate use of funds.

### **Phase 1: Track B – Technology Validation Pool of Funds**

- The degree to which the Lead Applicant is able to meaningfully demonstrate the quantity and quality of their likely projects and their ability to allocate the pool of funds to projects within the one year Project Period.
- The degree to which the Lead Applicant is able to demonstrate its ability to manage the proposed pool of funds, including administrative and reporting processes.
- The robustness of the Lead Applicant's project selection process, including the background and experience of the proposed members of the Eligible Institution's project selection committee. Note that a majority of the project selection

committee may not be employed or otherwise affiliated with Lead Applicant. It is preferred that Lead Applicants minimize their role in the project selection committee. As mentioned in [section 3.6](#), one member of the selection committee must be from the local ESP and at least one member must represent an outside angel or venture capital interest.

- The degree to which the Lead Applicant demonstrates its ability to integrate their activities with the Ohio Third Frontier Entrepreneurial Signature Program and other state-funded programs and organizations sharing complimentary missions.
- The degree to which the Program funds will be impactful as evidenced by the magnitude and realism of the projected metrics including the creation of new companies.
- The performance, if applicable, of prior Ohio Third Frontier awards. In particular, the licensing status of completed Phase 1 projects.
- Strong preference will be given to applications that can demonstrate that validation activities for individual projects will be performed or overseen by independent 3<sup>rd</sup> parties.

#### **Phase 2 – Start-Up Funds**

- Proposed proof needed to raise additional funds for commercialization is deemed meaningful and likely impactful to that end.
- Proposed proof can be generated during the one-year Project Period and with the proposed resources.
- Likelihood of being able to raise additional funds needed for commercialization at the end of the Project.
- Experience and commitment of the team members in commercializing new technology.
- Realism and achievability of the proposed business model.
- Stability and backing of company. Must have demonstrated backing and support independent of the Eligible Institution.
- Degree to which the intellectual property is protected relative to both the technology and the proposed business model.
- Potential opportunity of the start-up, including size of potential market.
- Completeness of budget narrative and appropriate use of funds.

**Upon request from ODSA or the external evaluators, in addition to the written proposal, Phase 2 applicants are expected to be able to provide their business plan, equity structure and a list of officers and their affiliations.**

The evaluation criteria are designed to support the mission and goals of Ohio Third Frontier and its various programs.

## **5 APPENDICES**

- A. Phase 1: Track A Application Forms and Questions**
- B. Phase 1: Track B Application Forms and Questions**
- C. Phase 2 Application Forms and Questions**
- D. RFP Process, Awards Process and Mandatory Compliance**

**OHIO THIRD FRONTIER  
CY 2015 TECHNOLOGY VALIDATION AND START-UP FUND PROGRAM**

**Frequently Asked Questions**

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## General

### Q: What is the overall purpose of this program?

A: As discussed in the RFP, the TVSF program has several objectives, but one could summarize it as: Economic development by enabling technology transfer offices to license technologies to start-up or young companies by funding commercial validation activities and providing early-stage, non-dilutive funding for start-up/young companies.

### Q: The best way to commercialize my technology is through an established company, not a start-up. Can I still apply?

A: This would not be consistent with the program goal of realizing economic impacts through start-up companies.

### Q: What's reimbursable under the program/what are the definitions of the budget categories?

A: There can be significant variability as to whether or not any given expense is reimbursable under the program. The following general definitions are intended to assist applicants in putting together their project budgets; understanding if an expense is actually reimbursable requires discussion with TVSF grant administrator:

**Personnel:** Compensation for personnel services which includes all compensation paid or accrued by the grantee for services of employees rendered during the period of the grant. It includes, but is not limited to, salaries, wages and fringe benefits.

**Purchased Services:** Individuals or firms hired to provide a specific service or product (product purchase or fee-for service) and not employed, either full-time or part-time, by the grantee. These types of services don't involve employee benefits, temporary employment or contracted labor. An executed agreement between both parties is typically required, referencing the scope of work and deliverables being provided.

**Supplies:** Tangible property other than equipment for business purposes only that can be expensed and consumed without delay (i.e., not capital equipment). Items are typically less than \$5000 and are necessary for continued operation of the project/business.

**Equipment:** Tangible long-term asset typically used with electricity which will depreciate over time. Individual items are typically more than \$5000 and are necessary for continued operation of the project/business.

## **Q: What's the difference between Supplies and Equipment?**

A: See the previous question. Additionally,

“Equipment” lasts longer than one year; “supplies” do not.

“Equipment” tends to be repaired; “supplies” tend to be replaced.

“Equipment” tends to cover items that are independent units; “supplies” tend to cover items incorporated into another item.

## **Phase 1: Track A**

### **Q: What do “Technology Validation” and “validation activities” actually mean?**

A: Definitions can be inferred or even found directly in the RFP. Here’s a slightly different way of characterizing these concepts: Phase 1: Track A of the program is intended to fund activities that will demonstrate the commercial viability of a technology. A proof-of-concept of the technology must already exist—thus “technology validation” is more geared towards commercialization than research. The types of activities one might engage in to demonstrate the commercial viability would be along the lines of prototyping, demonstration and assessment of critical failure points, miniaturization, etc.

### **Q: The RFP asks applicants to describe the proof needed to license. What is being sought here?**

A: Beyond indicating a quantifiable, measurable metric that will enable licensing the technology, applicants should explain the rationale for selecting that proof point, particularly external (industry) input if possible, to demonstrate that the proof point is appropriate. It is also advantageous to include cost estimates for your technology compared to established competitors.

### **Q: My technology needs to go through FDA or some other form of regulatory approval. Should I include information related to this?**

A: If regulatory approvals are needed for your technology, you should provide your current rationale for the pathway for approval, and discuss options if that pathway doesn’t materialize.

### **Q: I used to be employed at another institution and it has some ownership of my IP. Am I eligible to apply?**

A: If multiple universities are involved or named on patents, provide a narrative to clarify who has rights or claims against that and what impact that may have on the path to market. IP that is predominantly owned by a non-Ohio institution is likely a poor fit for the program.

### **Q: The RFP says that there’s a preference for validation activities to be conducted or overseen by an independent 3<sup>rd</sup> party. What does that mean?**

A: While universities and research institutions are excellent locales for the invention and initial stages of technology development, they are less well-suited for commercializing technologies. Thus the program prioritizes projects that have little to no work being done “in-house.” Ideally, the specifics of your project would be defined by prospective customers or a possible licensee, and the work to actually achieve those specifics would be conducted by an unaffiliated firm (engineering, etc.). The more work you do “in-house,” the greater the need to have the process overseen by a 3<sup>rd</sup> party. Your proposal narrative also needs to be more compelling in these instances.

**Q: Can a potential licensee provide the cost share or conduct the validation activities?**

A: Possibly, although these arrangements carry the risk that the project may appear as subsidized R&D for the company, which is not consistent with the objectives of the program.

**Q: Is it important to connect my technology with in-state technical, manufacturing or other significant capabilities?**

A: For some technologies, there's an obvious linkage with Ohio's strengths, thus spending too much space of the proposal on these linkages would not be helpful. That said, a technology that is fairly novel, disruptive or otherwise would require explanation for how it's linked to Ohio's strengths should definitely devote some space to discussing these connections (such as manufacturing partners, industry hubs, critical development resources). You should enable the evaluators to be able to answer the question "Why Ohio?"

**Q: Should I write about my technology in the context of the whole market or just the addressable market?**

A: You should focus on your best estimate of the addressable, not total, market. Total markets are often described in terms of multiple billions, but most Phase 1: Track A proposals would only address a small segment of that market. The significance of that addressable market is what will be examined by the evaluator.

**Q: How much information should I provide about competing technologies/products? Is it sufficient to just talk about my value proposition?**

A: Technologies and products that are similar to yours should definitely be addressed in the proposal—do not simply rely on your value proposition without also connecting that proposition to the competition. While you may understand why your technology is better, it is critical that you convey this information in your proposal. If you are proposing a truly novel technology without any known competitors, you should consider talking about products/technologies already in the space or technologies that are similar but ultimately aren't competitive with yours (and explain why they aren't competitive).

**Q: Should I discuss similar-looking technologies under development elsewhere in the world?**

A: You should discuss them and establish why your value proposition is superior or more likely to succeed.

### **Q: Do I need to justify equipment purchases?**

A: Yes. Any equipment you plan to purchase with TVSF funds/cost share should be well justified in your budget narrative. TVSF is not intended to be a capacity-building program; rather it is designed to support commercialization of specific technologies. Consider what resources you can use at the university before including new equipment in your proposal (for instance, if your university already owns several 3D printers, it is likely not a good use of TVSF funds to purchase another 3D printer just for your project).

### **Q: Do I need to include a budget narrative in the proposal?**

A: The evaluators are charged with assessing the merits of your proposal. It will be difficult or even impossible for them to do so if they can't connect your budget numbers to actual activities. You should include how you generated the budget numbers—i.e., do they represent simply your best guess or do you have actual quotes from service providers?

**Phase 1: Track B**

**There are no questions yet, but they will be added as needed.**

## Phase 2

**Q: Can I subcontract the work back to the institution that owns the IP? The institution is world renowned in this area and the best choice from my perspective.**

A: Generally, the answer is no. The intent of the program is to move the technology out of the institution. Continuing to use institutional resources runs counter to that intent, even if the institution is world renowned in the relevant field.

**Q: Can I hire a graduate student or post-doc at my university as an independent contractor to conduct some of the technical or other work in my proposal?**

A: Generally, the answer is no. See previous question.

**Q: What is the definition and example of “company backing”?**

A: Company backing is demonstrated by non-university financial or other resource commitments to a start-up company. Financial commitments from the private sector are considered the most impactful; some forms they can take include equity investments, convertible notes, or other cash infusions. Non-cost-share resources from potential customers or downstream partners in the form of materials and supplies, lab space, pilot plant time or personnel are also relevant, though less significant than cash infusions. The degree of independence of the company backing from the university and the start-up leadership team is taken into account.

**Q: Business Model robustness is often identified as a proposal weakness. What information is expected for a successful application?**

A: Applicants should provide a directional plan to be implemented by the start-up/ young company. This should include basic business metric assumptions such as projected revenue for the first few years, estimated unit costs and pricing and operational expenditures. If offered an interview, applicants should be prepared to justify their assumptions.

# Appendix A

## Ohio Third Frontier

### Technology Validation and Start-Up Fund

#### *Phase 1: Track A Application*

# Technology Validation and Start-Up Fund

2016 Request for Proposals: Phase 1: Track A Application Forms and Questions

## Phase 1: Track A Application Information Page

<b>This Application:</b> <input type="checkbox"/> Does <input type="checkbox"/> Does Not		include information considered a "trade secret" under Ohio Revised Code Section 1333.61(D)	
<b>Lead Applicant's Legal Organization Name:</b>			
<b>Technology Transfer Office Contact</b>	<b>Name:</b>		
	<b>Title:</b>		
	<b>Phone Number:</b>		
	<b>E-mail:</b>		
<b>Project Title:</b>			
<b>Patent Number, Patent Application Number, or Copyright Registration Number</b>			
<b>Total Project Budget</b>	\$	<b>Ohio Third Frontier Funds Requested</b>	\$
<b>This is a:</b> <input type="checkbox"/> new <input type="checkbox"/> revised Phase 1 proposal			
<b>If this is a revised proposal, please identify the round(s) of the previous submission(s)</b>		<b>Round(s):</b>	
<b>Technology Focus Area (select one)</b>			
<input type="checkbox"/> Software/Information Technology		<input type="checkbox"/> Biomedical/Life Sciences	
<input type="checkbox"/> Advanced Materials		<input type="checkbox"/> Sensors	
<input type="checkbox"/> Energy		<input type="checkbox"/> Advanced Manufacturing	
Typed Name of Authorizing Agent		Title of Authorizing Agent	
Signature		Date	

# Technology Validation and Start-Up Fund

## 2016 Request for Proposals: Phase 1: Track A Application Forms and Questions

### Financial Liability and Legal History

#### Financial Liability

The State of Ohio (the "State") will not give financial assistance of any type to an Applicant or company with outstanding financial obligations to the State or to an Ohio community or with outstanding environmental issues. The status of each Applicant will be verified with the Ohio Department of Taxation and with the Ohio Environmental Protection Agency.

Please answer the following questions. False answers may result in the State withdrawing any and all offers of financial assistance.

Does the Lead Applicant and/or company:

- |   |                              |                             |
|---|------------------------------|-----------------------------|
| a. Owe any delinquent taxes to the State, any state agency or a political subdivision of the State?                               | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| b. Owe any monies to the State or to a state agency for the administration or enforcement of the environmental laws of the State? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| c. Owe any past-due monies to the State, a state agency or a political subdivision of the State?                                  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| d. Have any existing tax liens?   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| e. Have a state loan on which it has defaulted?   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

#### Legal History

Has the Lead Applicant (or user), related companies or any officer:

- |   |                              |                             |
|---|------------------------------|-----------------------------|
| a. Been convicted of a felony?  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| b. Been convicted of or enjoined from any violation of state or federal law?  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| c. Been a party to any consent order or entry with respect to an alleged state or federal securities law violation? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| d. Been a defendant in a civil or criminal action?  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

# Technology Validation and Start-Up Fund

## 2016 Request for Proposals: Phase 1: Track A Application Forms and Questions

### Lead Applicant Contact Information

#### Authorizing Agent

Name		Title	
Organization			
Address			
City, State, Zip			
Telephone		Email	

#### Project Director

Name		Title	
Organization			
Address			
City, State, Zip			
Telephone		Email	

#### Fiscal Agent

Name		Title	
Organization			
Address			
City, State, Zip			
Telephone		Email	

#### Grant Administrator

Name		Title	
Organization			
Address			
City, State, Zip			
Telephone		Email	

**Authorizing Agent** – the individual authorized by the Lead Applicant to accept the terms and conditions of an award of Grant Funds. (The Grant Agreement will be sent to the Authorizing Agent)

**Project Director** – the individual authorized by the Lead Applicant to direct the Project for which the Grant Funds have been awarded.

**Fiscal Agent** – the individual authorized by the Lead Applicant to sign Grant-related financial documents, e.g., Requests for Payment, Grant financial reports, etc. (The Fiscal Agent should be the individual who actually interacts with ODSA regarding project invoices)

**Grant Administrator** – the individual authorized by the Lead Applicant to oversee the day-to-day administration of the Grant Funds, including preparing progress reports, monitoring project progress, etc.

**Note:** The same individual may hold more than one of these positions.

# Technology Validation and Start-Up Fund

## 2016 Request for Proposals: Phase 1: Track A Application Forms and Questions

The proposal **is limited to six pages total** and must include the **bolded part of each question followed by its response**. Suggestions on space allocations per section are included; however, applicants can allocate the six pages as they feel best presents the opportunity. Except for the required one page letter of support, any pages beyond the six-page limit will be eliminated from the Proposal before it is sent for review and evaluation and may also cause the proposal to be eliminated from consideration. Appendices, attachments, reports or other methods to augment the information presented in the proposal are not allowed. Reference to web-based information to supplement the proposal is not permitted, and such references will not be considered in the evaluation. Applicants are encouraged to review the program's FAQ, located on the Program's website: [https://development.ohio.gov/bs\\_thirdfrontier/tvsf.htm](https://development.ohio.gov/bs_thirdfrontier/tvsf.htm)

### **COMMERCIAL OPPORTUNITY**

- 1. Market Opportunity:** Describe the market opportunity including projected path and timeline to market entry of first product. In addition, please provide an estimate of the total capital needed to bring the product to market (and likely or known sources of that capital, e.g. grants, loans, self-financed, etc.). [suggestion 1/2 page]
- 2. Overview of Technology:** Briefly describe the technology/product, its competitive advantages, and its stage of development. [suggestion 1/2 page]
- 3. Proof Point:** Describe the proof needed to bring the technology to the point where it is either ready to be licensed to an Ohio start-up or deemed unfeasible for commercialization. Identify the independent 3<sup>rd</sup> party source for the validation activities and how they were selected to work on this project. [suggestion 3/4 page]
- 4. IP Position:** Describe the Intellectual Property position, how the Intellectual Property protects the business model of the expected start-up company, and how the Intellectual Property relates to other Intellectual Property in this space that may impact the business model. [suggestion 1/4 page]

### **TEAM CONSIDERATIONS**

- 5. Team:** Discuss the experience and commitment of team members in commercializing new technology. Discuss the relevant experience of the independent 3<sup>rd</sup> party who will be conducting the validation activities. [suggestion 1/2 page]

### **PROJECT DETAILS**

- 6. Ohio Start-up:** Discuss how this technology will likely lead to an Ohio start-up as opposed to a license to an established company. If you have worked with an Ohio start-up to identify the proof needed, please discuss. [suggestion 1/4 page]
- 7. Project Plan:** Describe a one year project plan that demonstrates how the needed proof will be generated. Describe the availability of resources required to conduct the

# Technology Validation and Start-Up Fund

## 2016 Request for Proposals: Phase 1: Track A Application Forms and Questions

proposed work, and demonstrate how the needed proof can be successfully generated during the project timeframe of one year. Note that preference will be given to applications which propose technology validation, prototyping, and assessment of critical failure points by an independent source. If an independent source is not involved, please justify. [suggestion 3 pages]

The following table, without modification to its column headers, must be used in your response to the above question. Where possible, the milestones described in the table should be quantifiable/ measurable in nature. Do not use more than 4,000 characters in any of the cells of the table.

Project Plan Summary Table					
	Milestone Name	Milestone Description	Timeframe	Approximate Funds Required	Provider(s)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

To describe “Timeframe” utilize months or weeks as appropriate (e.g. Weeks 1-4, Month 2, etc.).

- 8. Budget: Table and Narrative:** Complete the following budget table and provide a short narrative that links your budget to your project plan. Note that:
- Failure to include a narrative explanation of the budget will make a proposal ineligible for funding
  - Each expense incurred in the project must be paid on a pari passu basis.
  - Phase 1 awards are intended to advance technologies, not build lab capacity/ capability. As such, any equipment purchases for a phase 1 proposal must be adequately justified within the budget narrative.

The following table, without modification to its categories, must be used in your response to the above question.

# Technology Validation and Start-Up Fund

## 2016 Request for Proposals: Phase 1: Track A Application Forms and Questions

	<b>Project Funds(*)</b>	<b>Additional Cost Share (**)</b>
Personnel(†)		
Purchased Services		
Supplies		
Equipment		
<b>TOTAL</b>		

(†) No more than 25% of the total project budget may be allocated to personnel costs

(\*) This total represents Ohio Third Frontier and Cost Share Funds on a pari passu basis that cannot exceed \$100,000

(\*\*) Additional necessary Cost Share (i.e., above and beyond the 1:1 match) that, if proposed, will become required per terms of the Grant Agreement.

# Appendix C

## Ohio Third Frontier

### Technology Validation and Start-Up Fund

#### *Phase 2 Application*

# Technology Validation and Start-Up Fund

2016 Request for Proposals: Phase 2 Application Forms and Questions

## Phase 2 Application Information Page

<b>This Application:</b>	<input type="checkbox"/> Does	<input type="checkbox"/> Does Not	include information considered a "trade secret" under Ohio Revised Code Section 1333.61(D)
<b>Lead Applicant's Legal Organization Name:</b>	<b>Company Name:</b>		
	<b>Address:</b>		
	<b>Contact Person:</b>		
	<b>Phone Number:</b>		
	<b>Email:</b>		
<b>Ohio Secretary of State Registration Number</b>			
<b>Institution from which Technology will be Licensed</b>			
<b>Project Title:</b>			
<b>Patent Number, Patent Application Number, or Copyright Registration Number</b>			
<b>Total Project Budget</b>	\$	<b>Ohio Third Frontier Funds Requested</b>	\$
<b>The Project's Technology:</b> <input type="checkbox"/> did <input type="checkbox"/> did not receive Phase 1 funding from a previous TVSF cycle			
<b>This is a:</b> <input type="checkbox"/> new <input type="checkbox"/> revised Phase 2 proposal			
<b>If this is a revised proposal, please identify the round(s) of the previous submission(s)</b>		<b>Round(s):</b>	
<b>Technology Focus Area (select one)</b>			
<input type="checkbox"/> Software/Information Technology		<input type="checkbox"/> Biomedical/Life Sciences	
<input type="checkbox"/> Advanced Materials		<input type="checkbox"/> Sensors	
<input type="checkbox"/> Energy		<input type="checkbox"/> Advanced Manufacturing	

Typed Name of Authorizing Agent

Title of Authorizing Agent

Signature

Date

# Technology Validation and Start-Up Fund

## 2016 Request for Proposals: Phase 2 Application Forms and Questions

### Financial Liability and Legal History

#### Financial Liability

The State of Ohio (the "State") will not give financial assistance of any type to an Applicant or company with outstanding financial obligations to the State or to an Ohio community or with outstanding environmental issues. The status of each Applicant will be verified with the Ohio Department of Taxation and with the Ohio Environmental Protection Agency.

Please answer the following questions. False answers may result in the State withdrawing any and all offers of financial assistance.

Does the Lead Applicant and/or company:

- |   |                              |                             |
|---|------------------------------|-----------------------------|
| a. Owe any delinquent taxes to the State, any state agency or a political subdivision of the State?                               | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| b. Owe any monies to the State or to a state agency for the administration or enforcement of the environmental laws of the State? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| c. Owe any past-due monies to the State, a state agency or a political subdivision of the State?                                  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| d. Have any existing tax liens?   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| e. Have a state loan on which it has defaulted?   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

#### Legal History

Has the Lead Applicant (or user), related companies or any officer:

- |   |                              |                             |
|---|------------------------------|-----------------------------|
| a. Been convicted of a felony?  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| b. Been convicted of or enjoined from any violation of state or federal law?  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| c. Been a party to any consent order or entry with respect to an alleged state or federal securities law violation? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| d. Been a defendant in a civil or criminal action?  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

# Technology Validation and Start-Up Fund

## 2016 Request for Proposals: Phase 2 Application Forms and Questions

### Lead Applicant Contact Information

#### Authorizing Agent

Name		Title	
Organization			
Address			
City, State, Zip			
Telephone		Email	

#### Project Director

Name		Title	
Organization			
Address			
City, State, Zip			
Telephone		Email	

#### Fiscal Agent

Name		Title	
Organization			
Address			
City, State, Zip			
Telephone		Email	

#### Grant Administrator

Name		Title	
Organization			
Address			
City, State, Zip			
Telephone		Email	

**Authorizing Agent** – the individual authorized by the Lead Applicant to accept the terms and conditions of an award of Grant Funds. (The Grant Agreement will be sent to the Authorizing Agent)

**Project Director** – the individual authorized by the Lead Applicant to direct the Project for which the Grant Funds have been awarded.

**Fiscal Agent** – the individual authorized by the Lead Applicant to sign Grant-related financial documents, e.g., Requests for Payment, Grant financial reports, etc. (The Fiscal Agent should be the individual who actually interacts with ODSA regarding project invoices)

**Grant Administrator** – the individual authorized by the Lead Applicant to oversee the day-to-day administration of the Grant Funds, including preparing progress reports, monitoring project progress, etc.

**Note:** The same individual may hold more than one of these positions.

# Technology Validation and Start-Up Fund

## 2014 Request for Proposals: Phase 2 Application Forms and Questions

The proposal **is limited to six pages total** and must include the **bolded part of each question followed by its response**. Suggestions on space allocations per section are included; however, Applicants can allocate the six pages as they feel best presents the opportunity. Except for the required one page letter of support and the one page summary of a previous Phase 1 Award (if applicable), any pages beyond the six-page limit will be eliminated from the proposal before it is sent for review and evaluation and may also cause the proposal to be eliminated from consideration. Appendices, attachments, reports or other methods to augment the information presented in the proposal are not allowed. Reference to web-based information to supplement the proposal is not permitted, and such references will not be considered in the evaluation. Applicants are encouraged to review the program's FAQ, located on the Program's website: [https://development.ohio.gov/bs\\_thirdfrontier/tvsf.htm](https://development.ohio.gov/bs_thirdfrontier/tvsf.htm)

Upon request from Development or the external evaluators, in addition to the written proposal, Phase 2 applicants are expected to be able to provide their business plan, equity structure, and a list of officers and their affiliations.

### **COMMERCIAL OPPORTUNITY**

- 1. Market Opportunity:** Describe the market opportunity and size of the market that will be targeted. [suggestion 1/4 page]
- 2. Overview of Technology:** Briefly describe the technology/product, the competition, and the technology/product's competitive advantages. [suggestion 1/4 page]
- 3. Business Model:** Provide a detailed business model, plan for implementation and an abbreviated pro forma profit and loss (P&L) statement. Include a description of how the business will generate revenues and explain any underlying assumptions. [suggestion 1 page]
- 4. Development Stage and Timeline:** Describe the current technical stage of development and anticipated time to market. [suggestion 1/4 page]
- 5. Financial Stage:** Describe the current financial stage of development. Include a description of any outside investment received and/or revenues generated. [suggestion 1/4 page]
- 6. Commercialization and Financial Strategy:** Discuss the commercialization and financial strategy and provide an estimate (and likely sources) of the total capital needed to bring the product to market. [suggestion 1/2 page]
- 7. IP Position:** Describe the Intellectual Property position, how the Intellectual Property protects the business model of the company, and how the Intellectual Property relates to other Intellectual Property in this space that may impact the business model. [suggestion 1/4 page]

# Technology Validation and Start-Up Fund

## 2014 Request for Proposals: Phase 2 Application Forms and Questions

### TEAM CONSIDERATIONS

8. **Management Team:** Discuss the experience, time commitment and roles of the management team. Emphasize experience directly relevant to the proposed project. [suggestion 1/3 page]
9. **ESP Engagement:** Discuss how you have you engaged with your regional ESP regarding this project. Describe any feedback that was given on the project and if the company's business plan or this proposal was significantly impacted in response to that feedback. Describe any commitments the ESP has made towards providing additional services or support for the project should it be funded. [suggestion 1/4 page]

### PROJECT DETAILS

10. **Project Plan:** Describe a project plan that demonstrates market entry within one year or alternatively how the proof needed to raise additional funds for commercialization will be generated within one year. Discuss the project objectives, schedule and the availability of the required resources to complete the project plan. If the project requires cost share, explain how and from whom the additional funds will be raised. Clearly identify measureable end-of-project deliverable(s) that will enable commercialization or the raising of additional funds. Be sure to describe any input you've received from potential customers or follow-on funding sources that led to defining the project deliverable(s). [suggestion 1 and 1/2 pages]

The following table, without modification to its column headers, must be used in your response to the above question. Where possible, the milestones described in the table should be quantifiable/ measurable in nature. Do not use more than 4,000 characters in any of the cells of the table.

Project Plan Summary Table					
	Milestone Name	Milestone Description	Timeframe	Approximate Funds Required	Provider(s)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

# Technology Validation and Start-Up Fund

## 2014 Request for Proposals: Phase 2 Application Forms and Questions

To describe "Timeframe" utilize months or weeks as appropriate (e.g. Weeks 1-4, Month 2, etc.).

- 11. Budget: Table and Narrative:** Complete the following budget table and provide a short narrative that links your budget to your project plan. Note that proposals will be ineligible for funding if they fail to include a narrative explanation of the budget. [suggestion 1/2 page]

The following table, without modification to its categories, must be used in your response to the above question.

	Ohio Third Frontier Project Funds(*)	Cost Share (**)
Purchased Services		
Supplies		
Equipment		
<b>TOTAL</b>		

(\*) May not exceed \$100,000 (or \$150,000 if the proposal concerns Biomedical technology)

(\*\*) Any necessary Cost Share that, if proposed, will become required per terms of the Grant Agreement

- 12. Next Steps:** What is the next step in the commercialization path following completion of the TVSF Phase 2 project, and what are the next funding opportunities? If you have worked with specific potential investors to identify the proof they require to invest in your company, please discuss. [suggestion 1/2 page]