



2020

Advancing innovative
technologies from lab
to market



Maryland Innovation Initiative

ANNUAL REPORT



LEADING INNOVATION TO MARKET

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WELCOME TO THE Maryland Innovation Initiative

Dr. Arti Santhanam
Executive Director

Silvia Goncalves
Program Coordinator

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LETTER FROM **MII Executive Director & Chair of the Board**

Greetings,

Welcome to the FY20 Maryland Innovation Initiative (MII) Fund annual report. This report provides an overview of the MII program annual metrics with a snapshot of the technology commercialization ecosystem in Maryland.

With venture creation being at the core of what we do through the MII program, we are excited to share the successes of its eighth year as the premier tech transfer and commercialization fund in Maryland. MII's unique partnership model with Maryland's leading research universities has again yielded the program a wonderful diversity of technologies, competencies, and applicants. The goal of the program and fund has always been three-fold: to promote innovation and tech transfer, seed high-tech companies, and nurture and grow a sustainable innovation ecosystem. As you will see in our report, we continue to achieve these goals despite unforeseen challenges. This past year MII awarded a higher percentage of applications without compromising on quality. The MII portfolio companies continued to create jobs and generate demonstrable revenue, and crossed the \$500 million mark for follow-on investments (a prime indication of their growth and scalability potential).

In addition to venture creation, the program's technology-agnostic funding platform allows it to de-risk otherwise niche technologies. One of the largest economic development payoffs this year is a joint venture between UMBC and a Norwegian aquaculture giant, AquaCon, that is poised to result in an initial investment of over \$300 million in infrastructure and jobs in rural Maryland!

If we had to use one word to describe the program awardees, university tech transfer offices, and MII site miners this year, it would be *resilience*. Despite the unprecedented challenges of the COVID-19 global pandemic and MII's partner universities' labs being closed for an extended period, the MII awardees worked with us to continue to deliver on project milestones and even create new ventures. We are so thankful to our university tech transfer partners, scientists, and engineers who have endeavored to face the crisis. To them we say, bring on the pipeline of new ideas for engineering tools, diagnostics, and therapeutics. We hope our program accelerates many of these critical technologies from bench to market in the coming year.

The Maryland Innovation Initiative is a remarkable example of economic development through successful tech transfer-based public-private partnerships. We invite you to delve into our FY20 annual report and celebrate our challenges and our success.



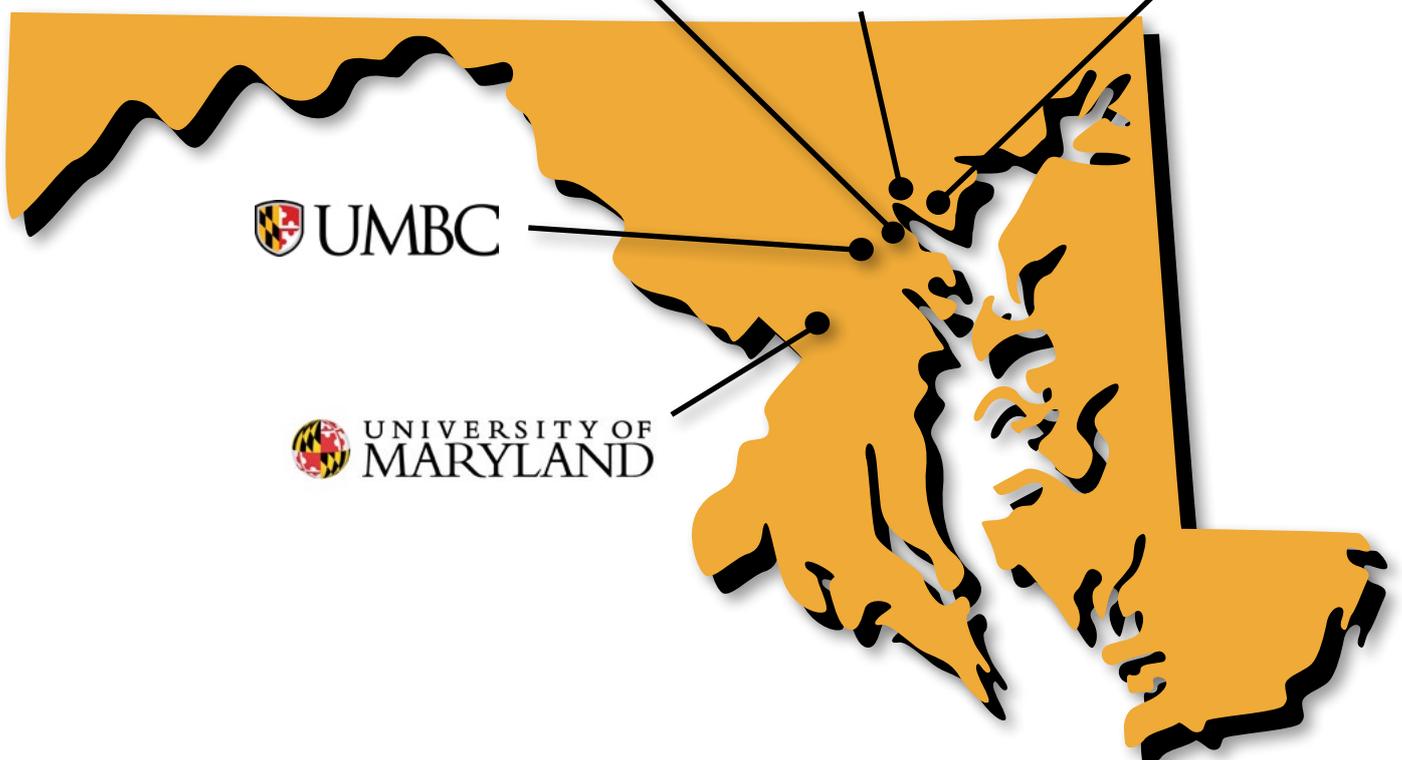
Robert Hallenbeck
Chair of the Board



Dr. Arti Santhanam
Executive Director

About the Maryland Innovation Initiative

The MII program is Maryland's premier early-stage technology transfer and commercialization program. Established in 2012, MII is a partnership between the State of Maryland; Johns Hopkins University; Morgan State University; the University of Maryland, College Park; the University of Maryland, Baltimore; and the University of Maryland, Baltimore County. The program's mission is to accelerate promising technologies with significant commercial potential to market while leveraging each partner university's strengths. This "Bench-to-Market" approach is encouraged through start-up creation. The program offers grants to de-risk technologies in the universities and investments to the spinouts as they begin their entrepreneurial journeys.



Program Overview

The MII Innovation Commercialization Program was created to foster the transition of promising technologies with significant commercial potential from partnering universities, where they were developed, to the commercial sector to mature into products and services that address identified market needs. The program is divided into two phases, a Technology Assessment Phase, and a Company Formation Phase for university start-ups.



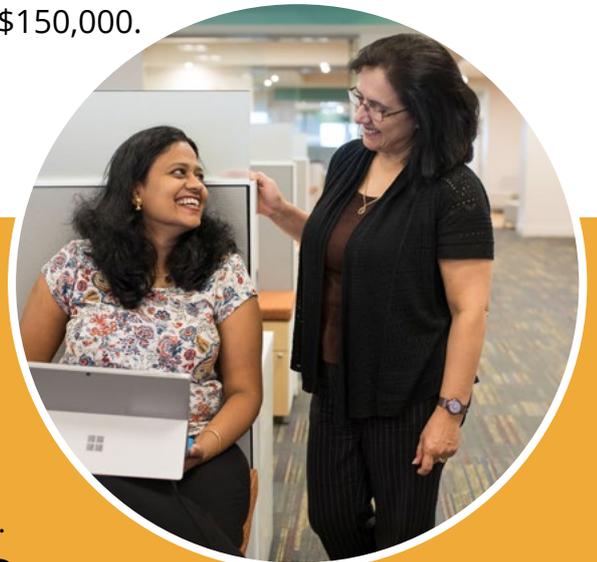
TECHNOLOGY ASSESSMENT

Technology Assessment grant awards are available exclusively to qualifying universities and are capped at \$115,000 a sole application and \$165,000 for a joint application. Projects, including all subcontracts, must be completed within nine months of the date of execution of the award.



COMPANY FORMATION

The Company Formation phase includes commercial product development in preparation for a product launch, or the advancement of a product to achieve a commercial milestone that significantly increases the company's commercial value and better positions them to attract follow-on investment from angels or venture capitalists. MII Company Formation investments are capped at \$150,000.



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TEDCO is committed to supporting start-ups through each step of their early-stage process, and MII is an ideal representation of the kind of support and guidance these companies can leverage to jumpstart their innovative products.

- **Dr. Arti Santhanam**
MII Executive Director

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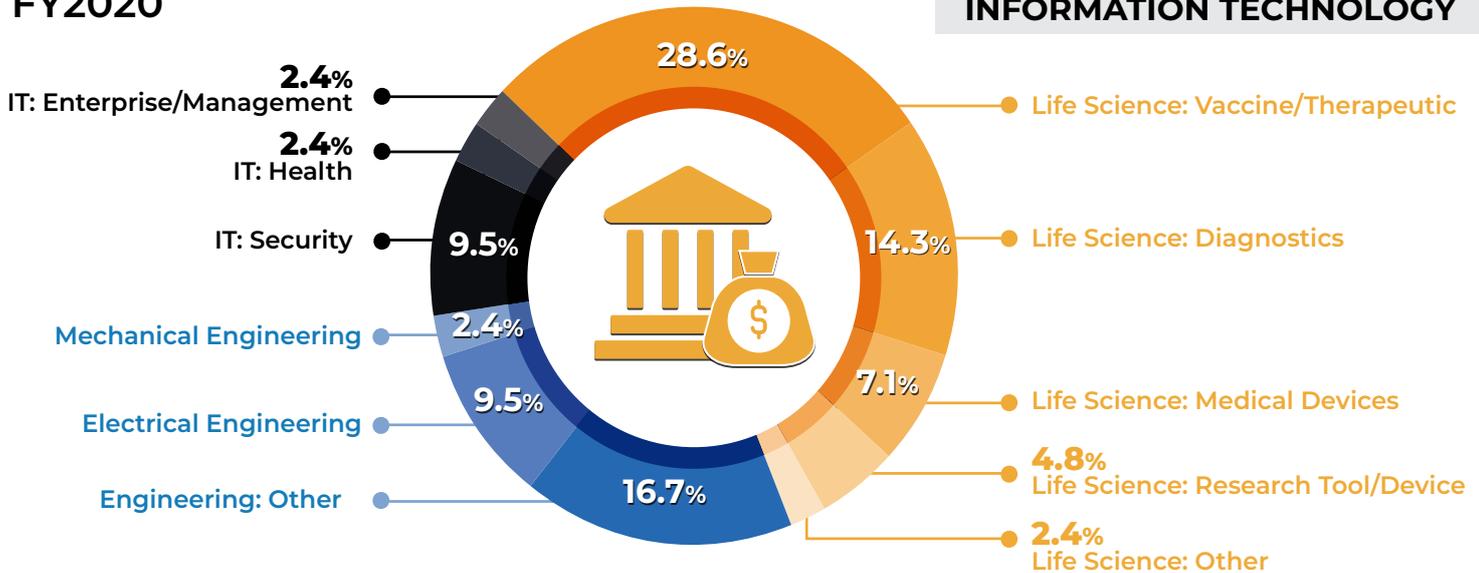
MII by the Numbers

MII supports a diverse portfolio of awardees from various technical domains that include but are not limited to life sciences, engineering, and information technology. The diversity of Awards by Tech Class ultimately reflects MII's partner universities and that of the world-class research conducted by scientists across the State.

Awards by Tech Class

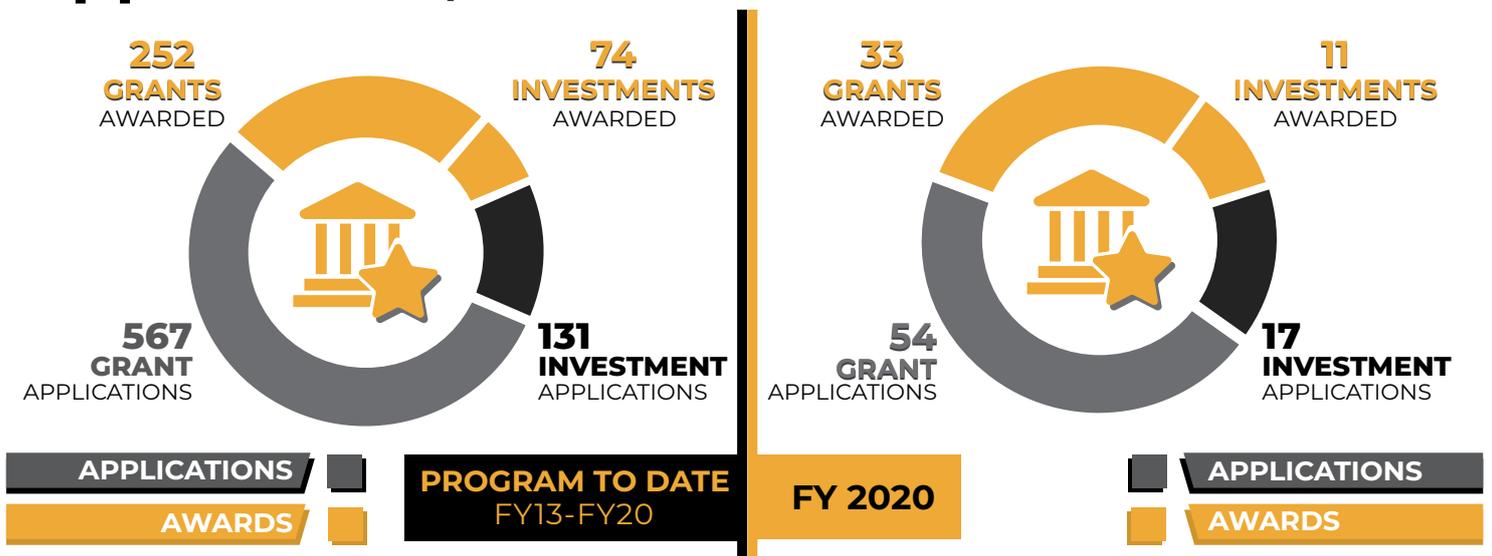
FY2020

LIFE SCIENCES
ENGINEERING
INFORMATION TECHNOLOGY



To date, MII has reviewed 567 grant and 131 investment applications and has an award funding rate of 44% and 56% of applicants, respectively. In FY20 alone, MII reviewed 54 grant and 17 investment applications and awarded funding to 61% and 65% of applicants. While the demand for MII funding remains consistently high, the success rate for funding is also a reflection of the maturation of the ecosystem as the program's applicants become increasingly savvy about technology commercialization.

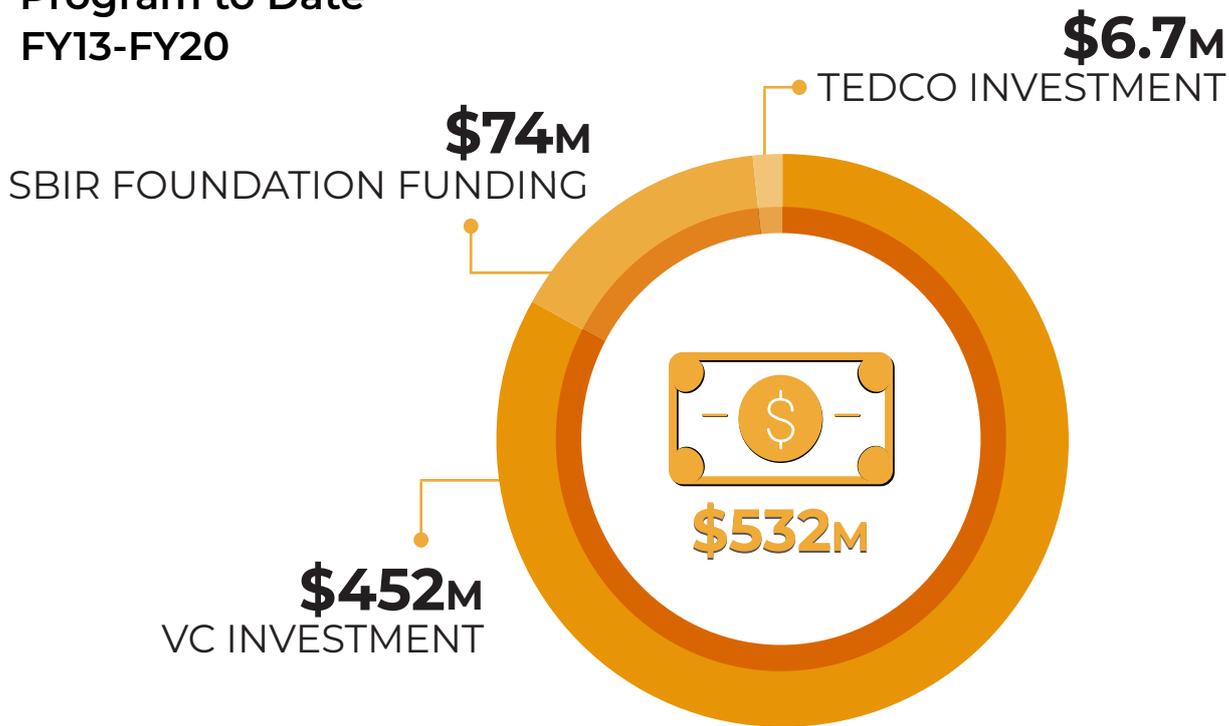
Applications, Grants and Investments



MII creates successful, scalable start-up tech companies in Maryland, as demonstrated by their ability to attract follow-on funding. One reflection of their continued growth and an indirect return on MII investment is the ability of these fledgling start-ups to attract follow-on funding. Over the past eight years, MII companies have successfully de-risked technology and attracted over \$500 million in follow-on funding. Furthermore, 81% of this funding comes from sophisticated tech investors such as angels and venture capitalists.

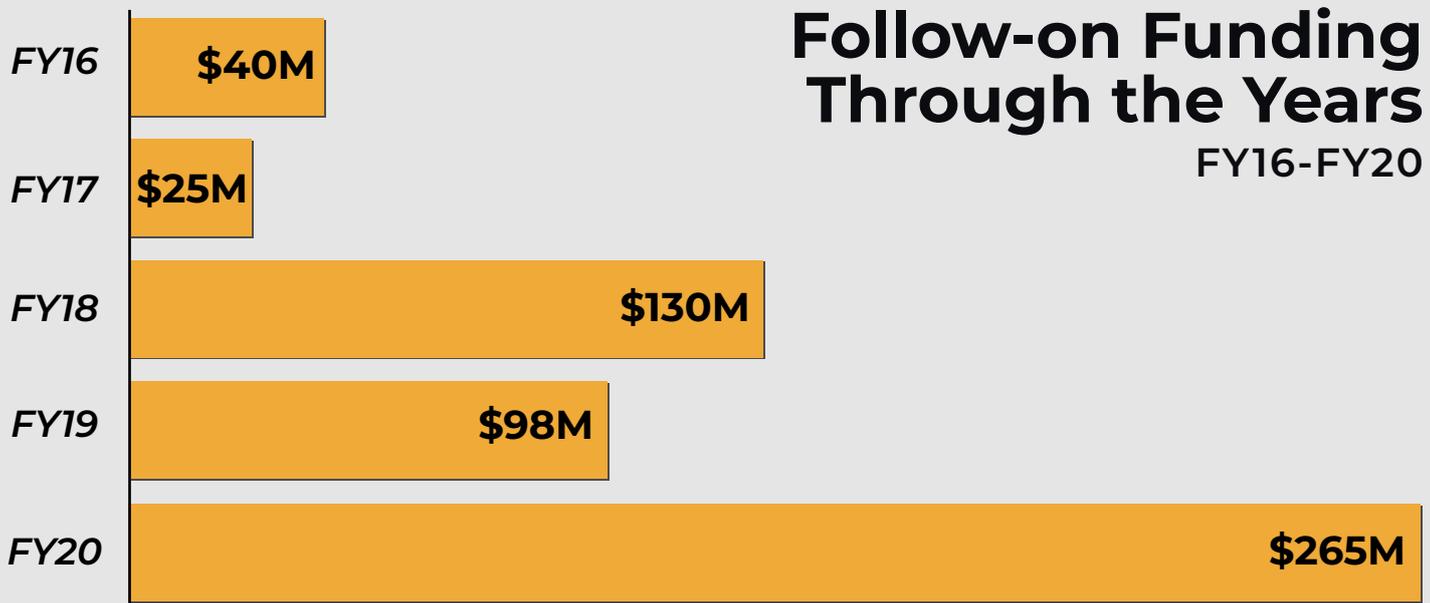
Follow-on Funding

Program to Date
FY13-FY20



Follow-on Funding Through the Years

FY16-FY20



8. Maryland Innovation Initiative

\$39M

INVESTED



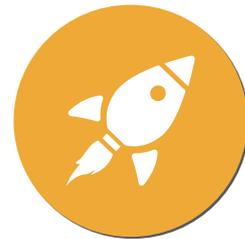
\$17M

TOTAL ACTIVE
MANAGED



\$9.3M

PROGRAM \$



\$7.7M

POST-PROGRAM \$



30%

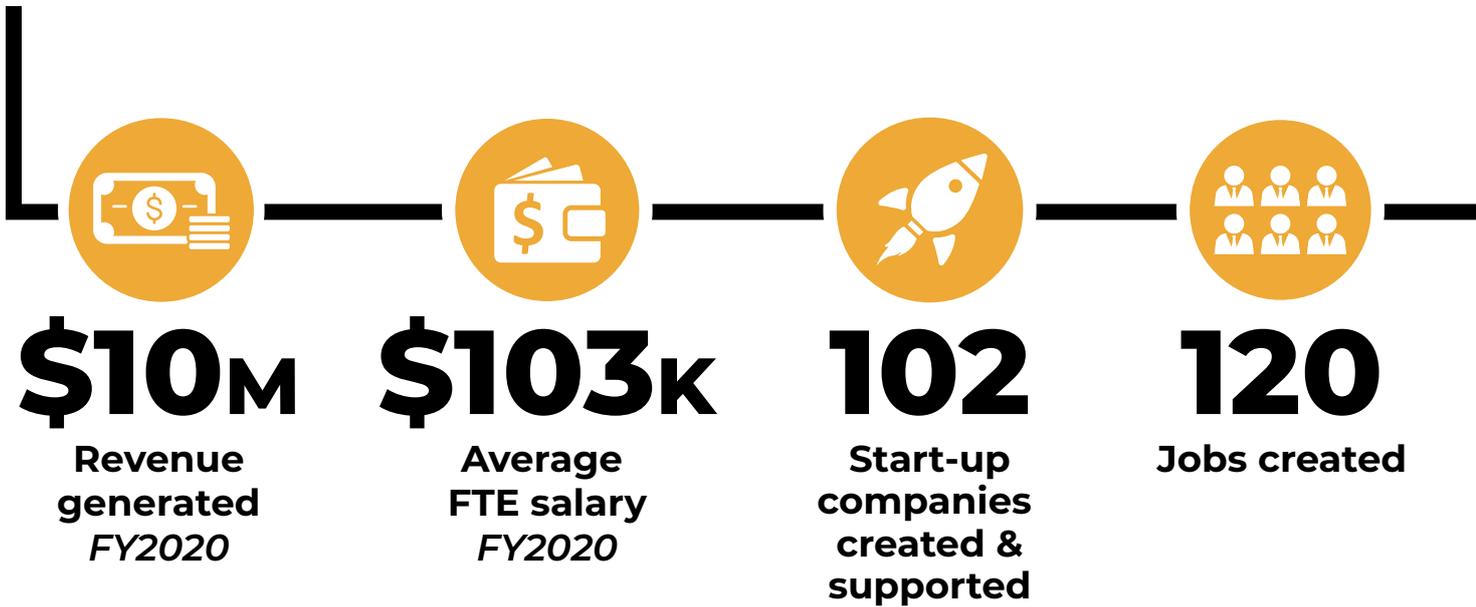
START-UP FORMATION

Portfolio Management

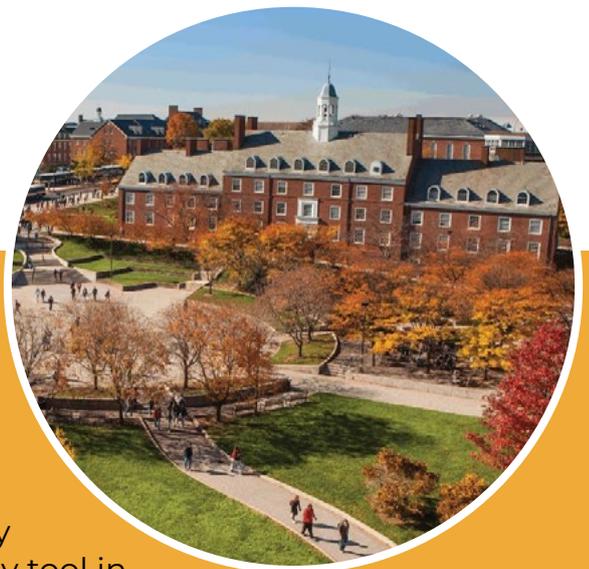


Program to Date
FY13-FY20

Economic Impact



MII has funded/invested a total of \$39 million over the past eight years while maintaining a steady 25-30% start-up creation rate—a testament to the program model and the excellent work of the MII site miners and university tech transfer offices. While small, the MII team manages an increasing number of portfolio investments with the goal of accelerating commercialization. Indeed, 57% of the MII companies raise follow-on funds, either through grants or investments, within two years. While still fledgling, MII start-up companies have continued to contribute to the economic development of their communities through revenue generation and high-tech workforce development—a true economic development success.



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When I joined UMD a few years ago, I realized first-hand the power of what early stage funding such as MII can provide and worked to make sure we were maximizing our use of this program. It is an incredibly valuable catalyst for promising technologies and a key tool in helping us activate our fearless ideas for transformational impact.

- Julie Lenzer
University of Maryland, College Park

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MII FY2020

Portfolio Companies



Prebeo, LLC, located in Baltimore City, is a University of Maryland, College Park spinout developing an organ viability assessment system to improve kidney transplant outcomes.

Halocytech LLC, located in Baltimore City, is a Morgan State University spinout developing large-scale production of natural bio-products from cyanobacteria.



Vectech LLC, located in Baltimore, is a Johns Hopkins University spinout developing an AI-driven computer vision system, to empower public health organizations in the global fight against mosquito-borne disease.



EpiWatch, Inc., located in Baltimore, is a Johns Hopkins University spinout that has developed a mobile disease management (DM) software application for people with epilepsy (PWE) that runs on a smartwatch and its companion phone.

“

With Prebeo's KVAS, we aim to save lives by making the kidney transplantation placement process more efficient and drive better patient outcomes. Increasing the number of donor kidneys deemed viable for transplant is crucial to improving patient outcomes. We're grateful to TEDCO's MII program for their support of this important project.

- Chris Moad
Prebeo, LLC

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NuMoon Technologies
Security at Speed™

NuMoon Technologies LLC, located in Columbia, is a University of Maryland, Baltimore County spinout commercializing innovative detection solutions that enhance the safety and security of military and civilian lives.



SOFTTHREAD

Softthread, Inc., located in Catonsville, is a University of Maryland, Baltimore County spinout building a scalable and intrusion tolerant permissioned blockchain system.



AliquantumRx, Inc., located in Baltimore, is a Johns Hopkins University spinout developing antibiotic, Cethromycin, for the treatment of dormant malaria.

Astek Diagnostics LLC, located in Baltimore, is a University of Maryland, Baltimore County spinout developing an automated system that determines the existence of bacteria in a blood sample and performs antibiotic susceptibility testing (AST) in less than one hour.



Kubanda Cryotherapy, located in Baltimore, is a Johns Hopkins University spinout providing affordable cancer care for pets through a novel, low-cost cryoablation device.

Neurologic Solutions, Inc., located in Baltimore City, is a Johns Hopkins University spinout developing a novel tool for seizure localization in medically refractory epilepsy.

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The MII program is unlike anything else out there...it was there for me when it was all a vision and a plan; a passion in my heart and in my mind. In the journey from vision to the actual formation of Airgility and the bright future ahead, it is all a direct result of the support from the MII Program and the incredible support we have always received from TEDCO. They believed in me, and now in us as a company, for this I/we will always be grateful.

- Evandro Valente
Airgility

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Bench to Bayside: An MII Success Story

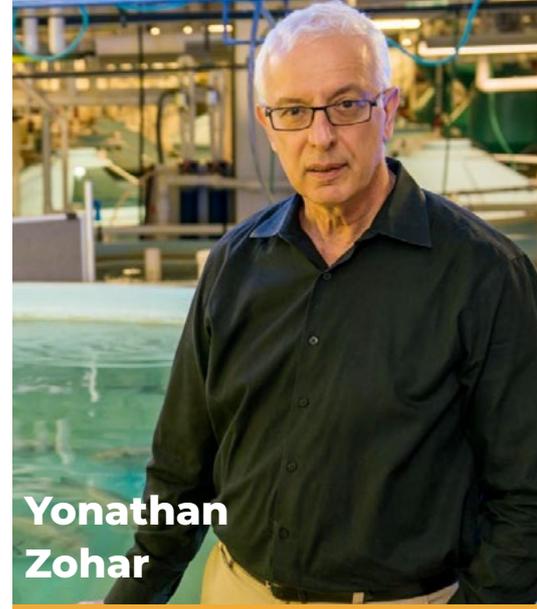
For over eight years, MII has successfully leveraged its partnership between the State of Maryland and its five academic research institutions to create meaningful contributions to Maryland's technology economy. Specifically, the program's mission is to accelerate promising technologies with significant commercial potential to market while leveraging each partner university's strengths.

This mission is exemplified by the MII investment of a Phase I and Phase II grant to University of Maryland, Baltimore County researcher, Yonathan Zohar. MII funding was instrumental in the development of innovative aquaculture platforms and novel forms of water recycling and waste conversion. Based on this transformative technology, AquaCon, an aquaculture firm from Norway, will partner with Zohar and his team to develop a land-based Atlantic salmon facility on Maryland's Eastern Shore.

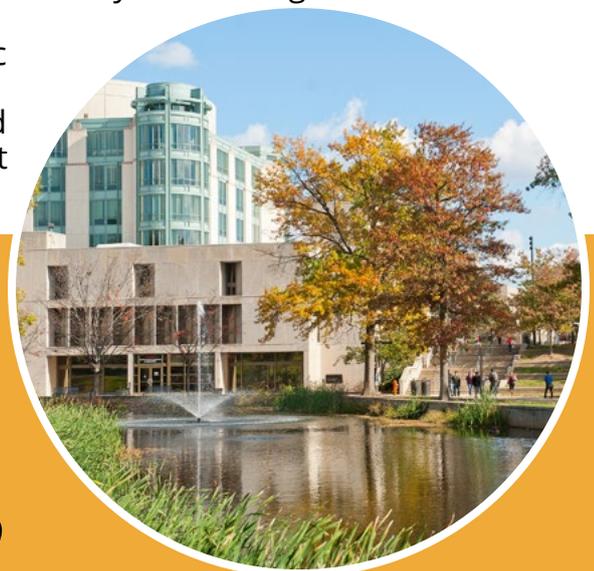
Dr. Zohar, a professor of marine biotechnology, says of MII's support of the project, "The MII grant enabled us to optimize technologies that convert salmon waste to fuel-grade biogas, which will help AquaCon to become one of the most environmentally responsible salmon producers in the world. It also drove us to found a UMBC spin-off start-up that will commercialize our technology platform to the aquaculture industry world-wide."

The project is expected to generate significant direct investment and job creation, as well as secondary economic development effects through growth in ancillary seafood processing and distribution on the Eastern Shore and across the State. AquaCon expects to invest at least \$1 billion over five years in the Maryland based project; beginning with a \$300M phase in the first quarter of next year. The project provides a considerable return to the State of Maryland compared to MII's modest investment.

MIl's Executive Director, Dr. Arti Santhanam says, "The success of this project is a perfect example of the reach and impact of the MII program. MII is a state-based technology innovation program that transcends traditional tech transfer by harnessing the collaborative power of the public and private sector to translate theoretical research into real and meaningful economic development. MII levels the playing field for public and private research universities as well as long-established or nascent tech transfer programs to create real impact on job creation and the Maryland economy."



**Yonathan
Zohar**



“

The MII program is a crucial part of UMBC's technology transfer process. We absolutely need this program in order to provide the essential continuum of support to our inventors.

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- Wendy Martin
University of Maryland, Baltimore County

COVID-19 Response

MII Companies Stepped Up

This spring the MII program and its partner universities faced a major hurdle in operations due to the COVID-19 crisis. However, the crisis also demonstrated the program's flexibility and adaptability. While a few MII companies quickly pivoted to assist in the State's efforts, the public health crisis has also inspired a new set of research projects in our application pipeline. Throughout the crisis, the applicants kept pace with the program and stepped up to this unprecedented challenge.



Gemstone Biotherapeutics, a life sciences company, provided another TEDCO portfolio company, Dipole Materials, with GMP guidance as Dipole Materials switched from a pure materials science company to manufacture N95 filters.



emocha Mobile Health, a digital health company, put its mobile video technology to work in response to COVID-19. They implemented a remote monitoring and engagement system at Baltimore-area hospitals affiliated with Johns Hopkins University and LifeBridge Health.



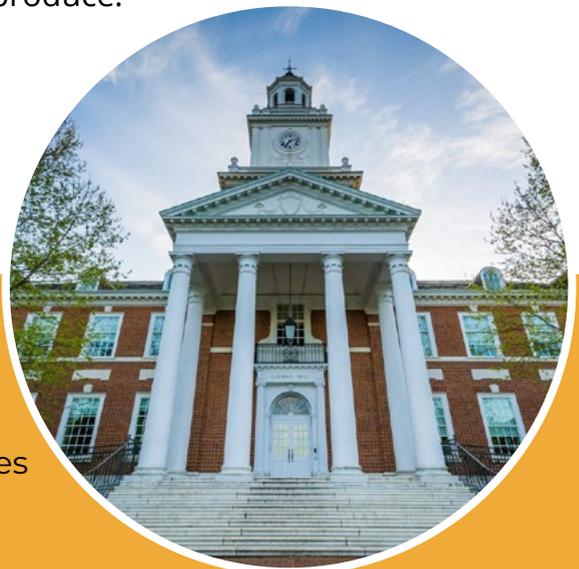
MBlue Labs, who was already generating revenue selling their clinically tested anti-aging skin care line, quickly pivoted their manufacturing facility to produce hand sanitizer and already has their first contract to mass-produce.

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It's a very rewarding opportunity for Hopkins to partner with other Maryland research universities in support of tech start-up creation. MII has proved to be a critical catalyst for the Maryland entrepreneurial ecosystem.

- Patrick Ho
Johns Hopkins University

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Media Highlights

TEDCO's Maryland Innovation Initiative infuses \$2.63M in new round of projects

Groundbreaking fish research by UMBC's Yonathan Zohar spawns partnership with AquaCon on \$1B Maryland aquaculture project

Glyscend Therapeutics completes \$20.5M financing round to advance Novel Oral Polymer Therapy for Type 2 Diabetes



TEDCO's Maryland Innovation Initiative Fund continues to deliver substantial impact for Maryland biohealth companies

NextStep Robotics raises \$500K while eyeing product launch

Baltimore start-up **NextStep Robotics** awarded NIH \$1M Cooperative Agreement



GALEN ROBOTICS Robotics company from Silicon Valley plots major growth in new Pigtown headquarters

Fighting Acne: A new approach sourced from viruses

Theraly Fibrosis awarded \$3.9M SBIR Phase II Grant to support development of TLY012 for chronic pancreatitis



Baltimore firm making medical devices for heart surgery raises \$8M



\$1.2M Seed round puts Maryland's **Pathotrak** on course to disrupt \$10B food safety market with Rapid Testing Technology



CoapTech LLC awarded \$1.2M grant from National Institutes of Health to support clinical evaluation and training for Novel PUMA-G Device



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The Maryland Energy Administration (MEA) has been a dedicated supporter of the Maryland Innovation Initiative. MEA supports energy innovation projects throughout the state via grants, tax incentives and partnerships with local businesses and nonprofit organizations. To learn more about how your organization can partner with MEA, visit www.Energy.Maryland.gov.

- Mary Beth Tung
Maryland Energy Administration

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Five female investors who are making their mark in life science—closing the gender gap

Two from Johns Hopkins named to National Academy of Engineering

Leadership Maryland announces Class of 2020

AsclepiX Therapeutics announces \$35M Series A financing



Sensing an opportunity to improve wind energy: Maryland Innovation Initiative and bwtech help UMBC faculty commercialize their research

LifeSprout, Inc. closes \$28.5M Series A financing



Drone industry aims for takeoff in Maryland



The U.S. Air Force Lab with MassChallenge selects inaugural cohort



Pilot project with MassChallenge reaches significant milestones



Baltimore's **Sonavex** raises \$3M, preps for national product launch



How some Johns Hopkins start-ups are adapting, responding to COVID-19



Sonavex secures new financing for limited release of commercial products



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TEDCO's MII program has been instrumental in supporting Morgan's technology transfer efforts to move our innovations along the commercialization pathway, and into new start-up companies.

- Willie May
Morgan State University

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Community Engagement



MII partnered with the Advanced Medical Technology Association (AdvaMed) on a Value Framework

Workshop in September 2019. The engaging session with AdvaMed on the reimbursement landscape for medical technology also covered how early-stage companies can demonstrate a strong value proposition for their medical innovations. Medical device and diagnostic start-ups gained an understanding of the resources available to them as AdvaMed members and applied the AdvaMed Value Framework Toolkit to their technologies. During an interactive Q&A, companies discussed and refined the value of their technology and the evidence needed to support its use.



Dr. Arti Santhanam participated in the Liftoff 2020 Advisory Committee with thought leaders from across the Mid-Atlantic region. In discussions, she explained how Maryland structured itself through TEDCO to capitalize off of its existing assets.



Dr. Arti Santhanam, MII Executive Director, was selected to participate in Leadership



Maryland's next cohort. Leadership Maryland is a professional development program dedicated to building a better Maryland by harnessing the strength of its local business and community leaders.

“

MII was created in 2012 to provide funding and entrepreneurial resources to commercialize projects from our world-class research universities in Maryland. The success of the program, particularly this year, due to the pandemic and highlighted within these pages, is beyond our expectations. I care deeply about the program, the role I play in its stewardship, and my continuing service on the authority. I am proud to serve with our Chair, Bob Hallenbeck, and my esteemed colleagues.

- Renée Winsky
Leadership Maryland

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TEDCO's 2019 Entrepreneur Expo

Five MII portfolio companies participated in TEDCO's Annual Entrepreneur Expo. Companies found that it created many opportunities to build connections and present their products to the broader Maryland community.



TEDCO's 2020 Legislative Showcase

Several MII portfolio companies participated in TEDCO's Legislative Technology Showcase during the 2020 Legislative Session. Companies promoted their business and talked with legislators about the support that MII and TEDCO provided to them.



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The Maryland Innovation Initiative has been a critical tool for University of Maryland, Baltimore technologies, providing much-needed financial support on the path to commercialization.

- Mary Morris
University of Maryland, Baltimore

”

Board of Directors



Robert Hallenbeck
*BD Biosciences
(Retired)*



Patrick Ho
Johns Hopkins University



Julie Lenzer
*University of Maryland,
College Park*



Wendy Martin
*University of Maryland,
Baltimore County*



Willie May
Morgan State University



Mary Morris
*University of Maryland,
Baltimore*



Mary Beth Tung
*Maryland Energy
Administration*



Renee Winsky
Leadership Maryland



Who We Are

MII SUPPORT STAFF

Arti Santhanam
MII Executive Director

Stephen Auvil
Executive Vice President, Programs

Tammi Thomas
Vice President, Marketing & Communications

Silvia Goncalves
MII Program Coordinator

Ira Schwartz
Counsel TEDCO

Ann Pulley
Director, Finance

Jody Sprinkle
Director, Government Relations

MII SITE MINERS

Bob Storey
Graham Allaway
Albine Martin
John Kessler

Richard Hughen
Elizabeth Good Mazhari
Alastair Mackay
David Fink

Robert Balcerzak
Chris White
Daniel Nadash
Mark Komisky
Annastasiah Mhaka

MII REVIEWERS

Irfan Ali
Greg Cooper
Glenn Falcao
Linda Folsom-Jackson
Vivek (Vick) Khera
Paul Laporte
Gus Simiao

Brian Skutt
Arti Varanasi
Guy Wassertzug
Kevin Chang
Steve Ferguson
Caroline Hoedemaker
Shree Koushik

Matthew Miessau
Jen Murray
Helen Pentikis
Wendy Perrow
Nilay Shah
Jeff Strovel
Niall Sweeny
Ken Walz





MARYLAND INNOVATION INITIATIVE

Our mission is to accelerate promising technologies with significant commercial potential to market while leveraging each partner university's strengths.

TEDCO

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Columbia, MD 21046

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