Board of Regents
Committee on Economic Development and Technology Commercialization

September 12, 2019
University of Maryland Global Campus
Adelphi, MD

Public Session Agenda

(1) Featured Start-Up: Veralox – Matt Boxer, Co-Founder, COO (Information Item)

(2) USM Maryland Momentum Fund – Claire Broido Johnson, Managing Director (Information Item)

(3) Maryland Industrial Partnerships Program – Joseph Naft, Director (Information Item)

(4) USM Office of Economic Development Update – Tom Sadowski, Vice Chancellor for Economic Development, and Lindsay Ryan, USM Venture Development Director (Information Item)

(a) Committee Objectives and 2020 Overview
(b) Industry Partnerships / Sponsored R&D
(c) Workforce Development
(d) Legislative Matters
(e) USM Venture Development Report

UNIVERSITY SYSTEM of MARYLAND

BOARD OF REGENTS

SUMMARY OF ITEM FOR INFORMATION

TOPIC: Featured Startup: Veralox

COMMITTEE: Economic Development and Technology Commercialization

DATE OF COMMITTEE MEETING: Thursday, September 12, 2019

SUMMARY: Matt Boxer, Matt Boxer, Co-Founder and COO of Veralox, will present the company, which recently received investment from the USM Maryland Momentum Fund. Veralox's lead clinical product candidate, VLX-1005, addresses two immune conditions with great unmet clinical need: Heparin-induced thrombocytopenia (HIT) and type 1 diabetes. The CEO, Jeffrey Strovel, earned a PhD in Human Genetics from the University of Maryland – Baltimore.

ALTERNATIVE(S): This item is for information purposes.

FISCAL IMPACT: There is no fiscal impact

CHANCELLOR'S RECOMMENDATION: n/a

COMMITTEE RECOMMENDATION: DATE:

BOARD ACTION: DATE:

SUBMITTED BY: Tom Sadowski (410) 576-5742

VERALOX THERAPEUTICS

Developing Novel Therapeutics Targeting 12-Lipoxygenase

VERALOX Team

Jeffrey Strovel, Ph.D. *Co-Founder, CEO*
Accomplished C-level executive in biopharma
20 years experience in Drug Discovery & Development

David Maloney, Ph.D. *Co-Founder, CSO*
Experienced scientific leader (3 development candidates, >90 publications)
Lead inventor of VLX-1005 and lipoxygenase expert

Matthew Boxer, Ph.D. *Co-Founder, COO*
Leader of matrix managed drug discovery model at NCATS. Project lead on multi-institutional collaboration resulting in development candidate in heme disease

Michael Holinstat, Ph.D.; *VP Translational Research*
Prof. of Cardiovascular Medicine and Surgery, Director Platelet Physiology and Pharmacology Core. University of Michigan. Platelet and lipoxygenase expert.

VERALOX THERAPEUTICS

VERALOX Scientific Advisory Board

Steven McKenzie, MD, Ph.D.
Prof. of Hematology
Jefferson University
Benign Heme, HIT Expert

Adam Cuker, MD
Prof. of Medicine
University of Pennsylvania
Benign Heme, HIT Expert

Anand Padmanabhan, MD, Ph.D.
Medical Director, Blood Research Inst.
Medical College of Wisconsin
Benign Heme, Diagnostics and HIT Expert

Jerry Nadler, MD
Dean, School of Medicine
New York Medical College
Diabetes Expert

Gowthami Arepally, MD
Prof. of Medicine and Pathology
Duke University
HIT and Immune Thrombocytopenia Expert

Ted Holman, Ph.D.
Prof. of Chemistry and Biochemistry
UC Santa Cruz
Lipoxygenase Target Expert

Michael Hanna, MD
Cardiologist & Clinical Trialist
Critical Thinking Consulting
Led Clinical Development of Eliquis for BMS

Raghu Mirmira, MD, Ph.D.
Director, Diabetes Research Center
Indiana School of Medicine
Diabetes Expert

VERALOX THERAPEUTICS

Problem: HIT/T and T1D

Heparin-Induced Thrombocytopenia & Thrombosis (HIT/T)

- Deadly immune response to heparin
  - 28% of patients die; ~10% lose limbs/gangrene
- Unmet need: Unacceptable clinical outcomes remain with Argatroban, the only FDA approved therapy
- Global market for heparin $14.3B by 2022 (CAGR 6.2%)

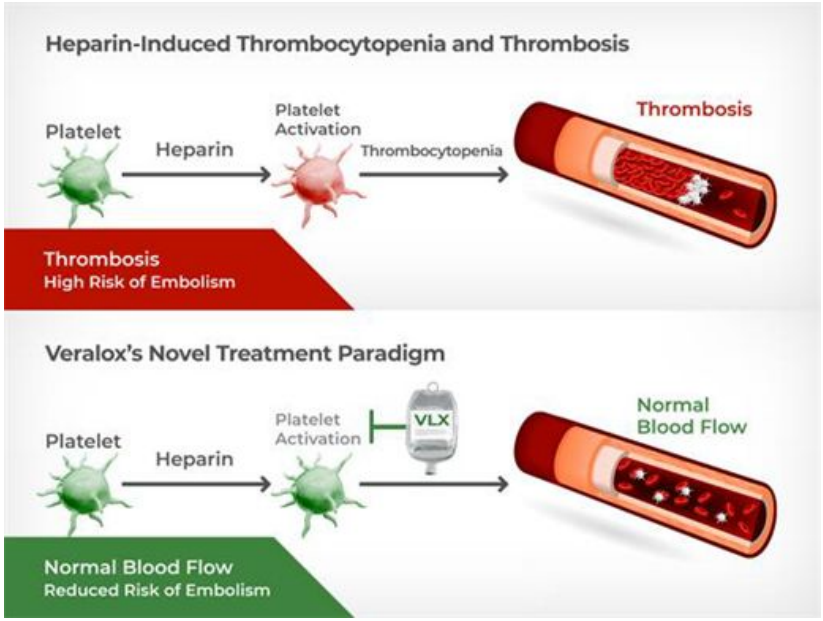
Type-1 Diabetes (T1D)

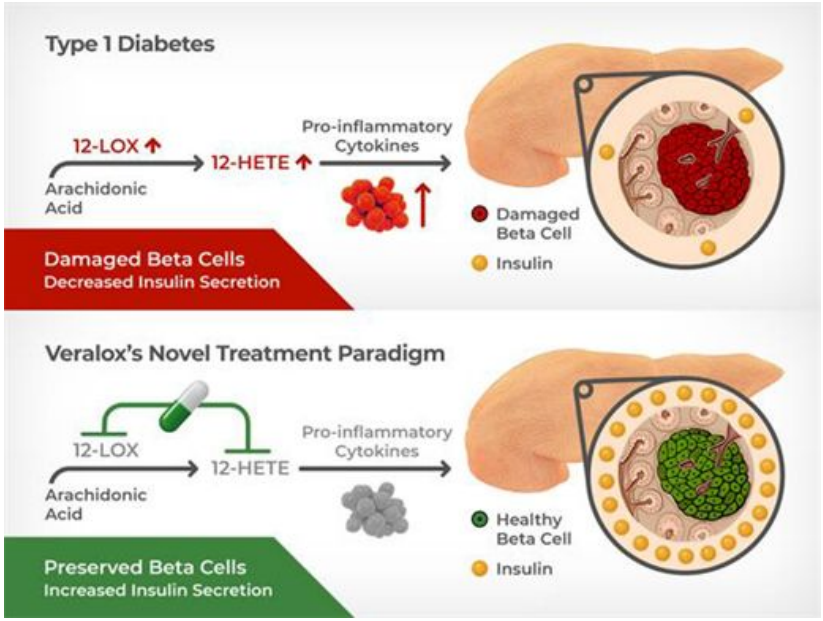
- Multifactorial (genetic, autoimmune, viral), with no cure
  - ~1.5M people living with disease in US; ~50K diagnoses each year
- Standard of medical care for last 100 years is still insulin
- First disease-modifying therapy would enter a white space of $1B+ in yearly sales

VERALOX THERAPEUTICS

Solution: VLX-1005; The First and Only-in-Class 12-LOX Inhibitor

❑ Potential Cure for unmet medical needs





Company Status

- Recently closed on $5.4M in seed financing [Q2 2019] led by Sanofi Ventures, T1D Venture Fund and VTC Innovation & Seed Fund
  - Syndicate includes Maryland Momentum Fund, TEDCO and University of Vermont Health Network
- Numerous non-dilutive grant applications submitted in 2019
- Pursuing investigational new drug-enabling studies for progression to clinical trials
- Hiring planned for Q4-2019/Q1-2020

VERALOX THERAPEUTICS

Veralox in Maryland

- Co-founders and Veralox located in Maryland
  - Veralox located at Frederick Innovative Technology Center Inc (FITCI)
  - Dr. Strovel received Ph.D. from U. of Maryland School of Medicine
  - Drs. Maloney and Boxer spent ~10 years at NIH
- In-state support from USM/MMF, TEDCO, BHI and FITCI enable Veralox growth
- Veralox contracts with numerous service providers in Maryland
- Current and future capital raises will help support the Maryland biopharma ecosystem

VERALOX THERAPEUTICS

Summary

- Experienced management team and world-class SAB
- VLX-1005: first-in-class small molecule inhibitor of 12-lipoxygenase (12-LOX), result of 10 years R&D at top-tier research institutions and foundations
- Products address huge unmet medical needs with blockbuster potential
- Maryland Momentum Fund early investment interest was key for company gaining traction and bringing syndicate together
- Multiple exit scenarios in the next 6 years

VERALOX THERAPEUTICS

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BOARD OF REGENTS

SUMMARY OF ITEM FOR INFORMATION

TOPIC: USM Maryland Momentum Fund

COMMITTEE: Economic Development and Technology Commercialization

DATE OF COMMITTEE MEETING: Thursday, September 12, 2019

SUMMARY: Claire Broido Johnson, the new Managing Director of the USM Maryland Momentum Fund, will present background on the Fund, the latest investments, information about the experience that she brings to the Fund, her current activities and near-term plan for promotion of the Momentum Fund to USM companies and co-investors.

ALTERNATIVE(S): This item is for information purposes.

FISCAL IMPACT: There is no fiscal impact

CHANCELLOR'S RECOMMENDATION: n/a

COMMITTEE RECOMMENDATION: DATE:

BOARD ACTION: DATE:

SUBMITTED BY: Tom Sadowski (410) 576-5742

Maryland Momentum Fund

Board of Regents

http://momentum.usmd.edu/

September 12, 2019

Claire Broido Johnson
cbjohnson@usmd.edu

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MARYLAND MOMENTUM FUND

University System of Maryland

MARYLAND MOMENTUM FUND

USM Momentum Fund

Organization: Background and Structure

- **Establishment.** Board of Regents approved in June 2016 as $25MM venture fund ($10 MM over 4 years from USM), $15 MM from non-USM

- **Precedent.** UM Ventures investments and loans in FY15 of $400,000 total in 5 startup companies, which had early success but was limited to those licensing USM intellectual property

- **Goals as written.**
  - Generating long-term financial returns which will be reinvested in future start-ups
  - Accelerating success of USM start-ups
  - Expanding economic development in State of MD
  - Recruiting and retaining innovative students and faculty
  - Keeping recent grads in the State of MD

- Expenses covered by Center for Maryland Advanced Ventures, housed at UMB

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MARYLAND MOMENTUM FUND

USM Momentum Fund

Example big win

- **Harpoon.** Medical device for mitral valve heart surgery from UMB. UM Ventures had the authority to invest $100K
- After Harpoon raised gap funding to complete human trials and got regulatory approval, Edwards Scientific invested, then later acquired Harpoon
- 20 to 1 return on investment
- Raised stature of UMB, Dr. Gammie, brought Edwards Scientific into Baltimore life sciences ecosystem

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MARYLAND MOMENTUM FUND

USM Momentum Fund
Success

- **What constitutes success?**
  - Returns – which will be reinvested in future start-ups
  - Catalyze additional investment (and therefore the market)
  - Support development of innovation ecosystem by helping promising, typically pre-revenue USM companies across the funding gap to a point at which they will do a round with actual VCs or can be acquired
  - Invest in fixture companies (start here, grow here, stay here)
  - Create jobs (attract, retain, grow)

Past Managing Director spent over 60% of his time helping companies find co-investors

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MARYLAND MOMENTUM FUND

USM Momentum Fund

Organization: Investments to Date: $2.5 matched by $11.2MM (> 4.4X match)

Average investment: $319 K, average deal size: $1.7 MM

GEMSTONE BIOTHERAPEUTICS

UMBC Alum, UMCP Alum, Jul 2019

$250k invested, $1.3 MM round

Tissue regeneration stem cell company

MFFIRE

UMCP IP, Alum, May 2017

$198k invested, $1.2MM round

World's most advanced wood burning stove

NAWEC
THE NORTH AMERICAN WAVE ENGINE CORPORATION

UMCP IP, Alum, Jan 2018

$350k invested, $1.5MM round

Advanced pulse jet engine

NEXTSTEP ROBOTICS

UMB IP, Aug 2017

$250k invested, $1.14MM round

Exoskeleton robot to reverse foot drop for stroke victims

Raised $600k follow-on round

PAVER GUIDE
ADVANCING PERMEABLE

UMCP IP, Feb 2019

$300k invested, $675k round

Advanced semipermeable pavement system

retrium

UMCP Alum, Apr 2019

$400k invested, $1.6MM round

Agile software development management product

VERALOX THERAPEUTICS

UMB IP Alum, Jul 2019

$500k invested, $5.4MM round

Anticoagulant drug, therapeutics for rare blood disorders

ZEST TEA

UMCP Alum; Nov 2018

$300k invested, $1.035MM round

High Caffeine Tea, Energy drink product

Co-Investors (sample): RW Deutsch Foundation, Bunting Foundation, Abell Foundation, Lord Baltimore Fund, Angel investors, high net worth individuals, Chesapeake Bay Seed Capital Fund, Dingman Angels

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MARYLAND MOMENTUM FUND

USM Momentum Fund

Claire Broido Johnson

- Senior operations executive
- Proven track record in creating and managing successful businesses and driving operations (including as founder of SunEdison).
- 9 years as President of CBJ Energy, a financing, operations, and business development energy solutions firm headquartered in Baltimore
- Angel investor (member of Baltimore Angels, affiliate at Blu Ventures, etc.)
- Highly involved in growing entrepreneurial ecosystem in Baltimore (Betamore Advisory Board, give classes at ETC, judge business plan competitions, informal support of entrepreneurs)

- I care deeply about growing the entrepreneurial ecosystem in Maryland
- **I believe Momentum Fund can help stimulate investment, teach early stage entrepreneurs how to pitch, build business plans, and raise money, and strengthen and expand the investor network**

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MARYLAND MOMENTUM FUND

USM Momentum Fund

My First 90 days

- Received feedback from Advisory Board, companies with investments from MMF, ecosystem broadly
- Create Charter for Advisory Board
- Systemize process for due diligence
- Add Advisory Board members
- Agree upon monitoring plan (quarterly financials, milestones and progress v. milestones)
- September 24 Investment Committee to potentially approve Neoprogen, Minnowtech
- Market MMF and coordinate across USM to broaden the funnel of potential investments
  - In FY19, former Managing Director reviewed 137 companies, 6 recommended for investment (.4%)

UNIVERSITY SYSTEM of MARYLAND

BOARD OF REGENTS

SUMMARY OF ITEM FOR INFORMATION

TOPIC: Maryland Industrial Partnerships

COMMITTEE: Economic Development and Technology Commercialization

DATE OF COMMITTEE MEETING: Thursday, September 12, 2019

SUMMARY: Joseph Naft, Director of the Maryland Industrial Partnerships Program (MIPS), will provide an update. MIPS provides matching awards for collaborative R&D projects between industry and University System of Maryland faculty. Funds from MIPS and Maryland companies go toward accelerating research and knowledge into products.

ALTERNATIVE(S): This item is for information purposes.

FISCAL IMPACT: There is no fiscal impact

CHANCELLOR'S RECOMMENDATION: n/a

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SUBMITTED BY: Tom Sadowski (410) 576-5742

Maryland Industrial Partnerships

Matching Awards for collaborative R&D projects between industry and University System of Maryland faculty

Joseph Naft, Director

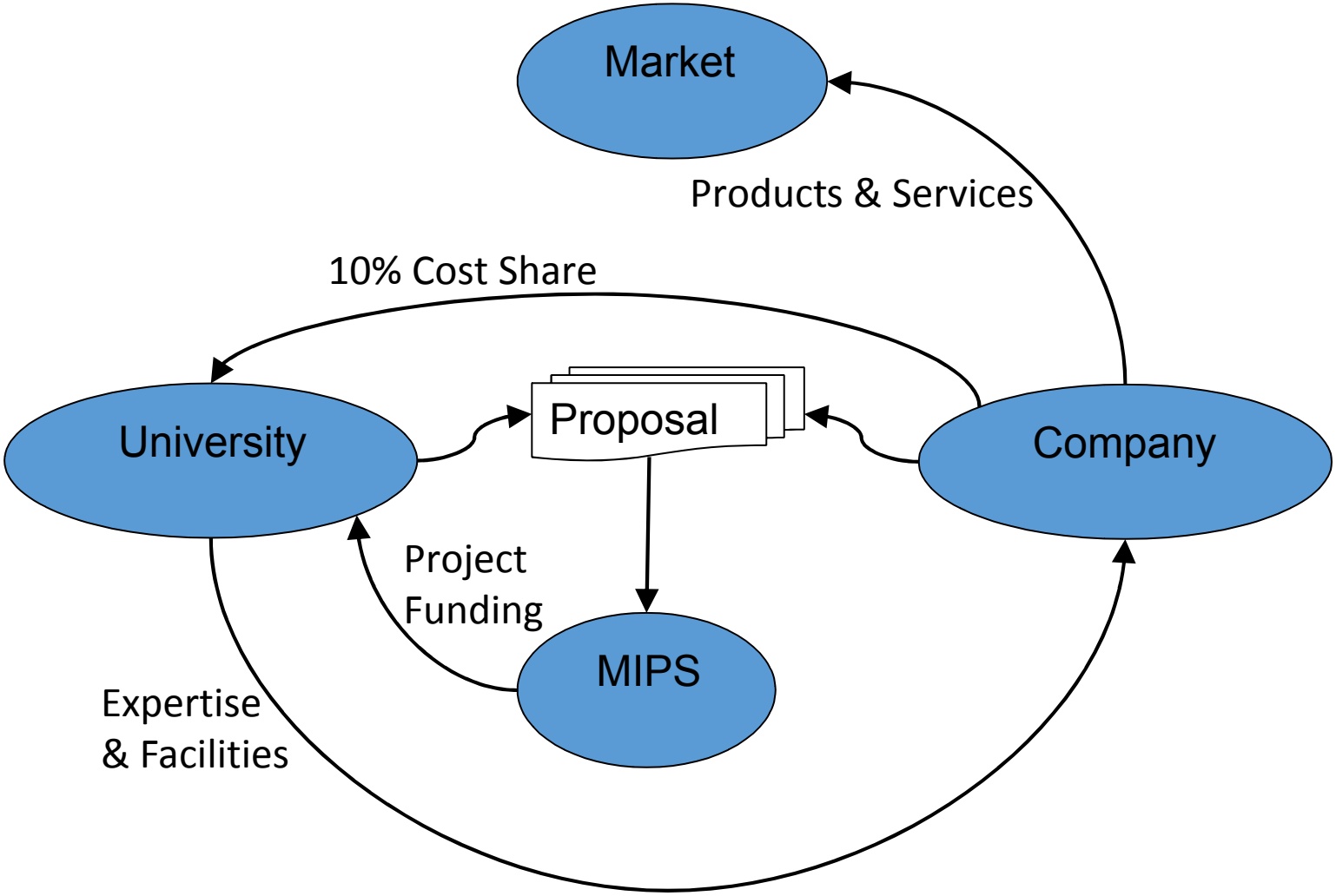
Ronnie Gist, Associate Director

MIPS Overview

- MIPS fosters academic-industrial partnerships for innovation aimed at job creation
- Funds from MIPS and Maryland companies go toward accelerating research and knowledge into products
- **Commercialization potential (economic development) is the primary criterion**

Key Points about MIPS

- MIPS projects are conducted by university faculty in conjunction with company researchers
- Proposals are evaluated on technical merit and economic development potential
- Projects jointly funded by MIPS & companies
- All funding goes toward university project costs
- Not required to be university I.P.



MIPS Program Flows

Eligible Campuses

- Bowie State University
- Coppin State University
- Frostburg State University
- Morgan State University
- St. Mary's College of Maryland
- Salisbury University
- Towson University
- U of Baltimore
- U of Maryland, Baltimore
- U of Maryland, Baltimore County
- U of Maryland, College Park
- U of Maryland Eastern Shore
- U of Maryland Global Campus
- U of Maryland Center for Environmental Science

Eligible Companies

Any company that has a Maryland presence that will likely add Maryland jobs if the project proves successful.

More Key Points about MIPS

- MIPS is win-win-win:
  - Companies leverage their R&D funding and gain access to faculty expertise
  - Non-dilutive, non-debt funding
  - Faculty and students gain funding to engage in commercially relevant research
  - State benefits via accelerated and increased tax revenue

MIPS: The Process

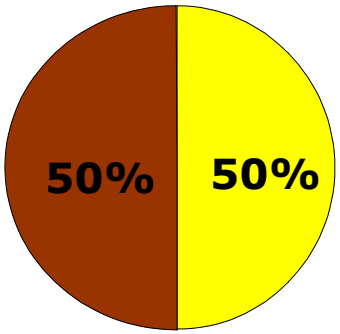
Competition for MIPS Awards

The primary criterion for ranking proposals:

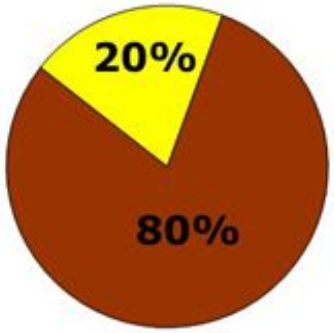
What is the likely degree of long-term job creation in Maryland resulting from the proposed R&D project?

Minimum Company Cash Contribution

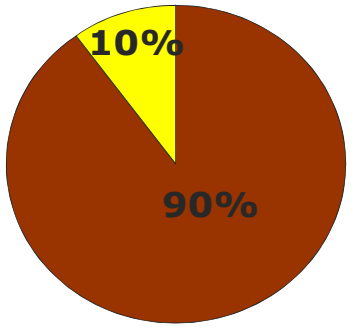
Large Company >100



Small Company 21 to 100



Start-Up Company* 1 to 20



Company Share

MIPS Share

**** Plus other requirements***

MIPS offers up to $100K/year in funding for projects for up to two years. With minimum company cash contributions, total project value can be:

$200K for startups

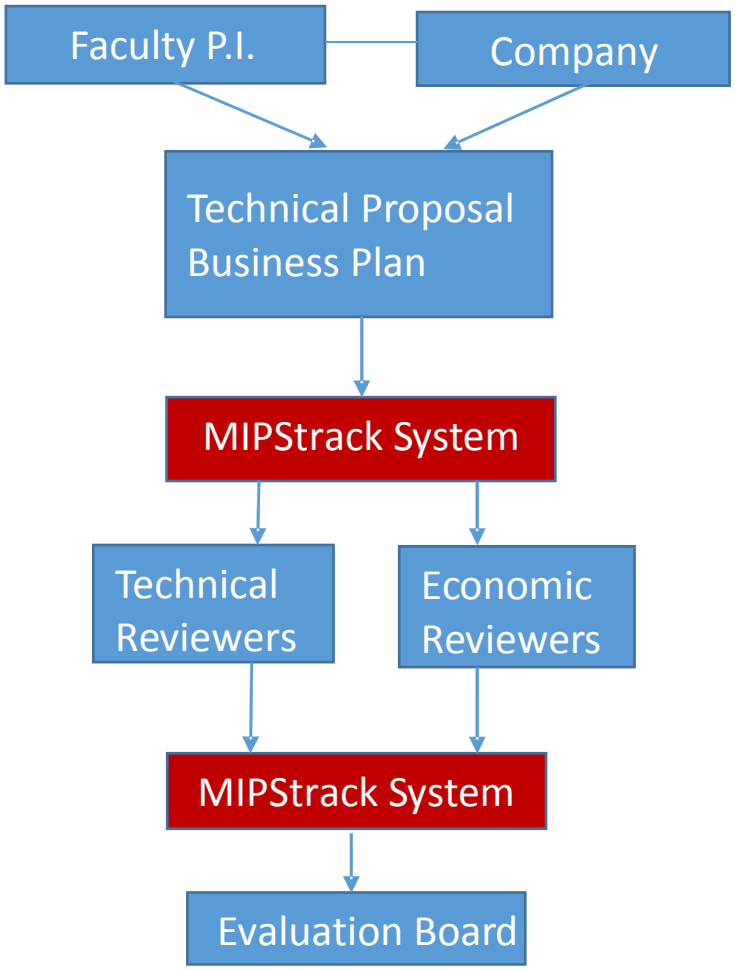
$250K for small companies

$400K for large companies

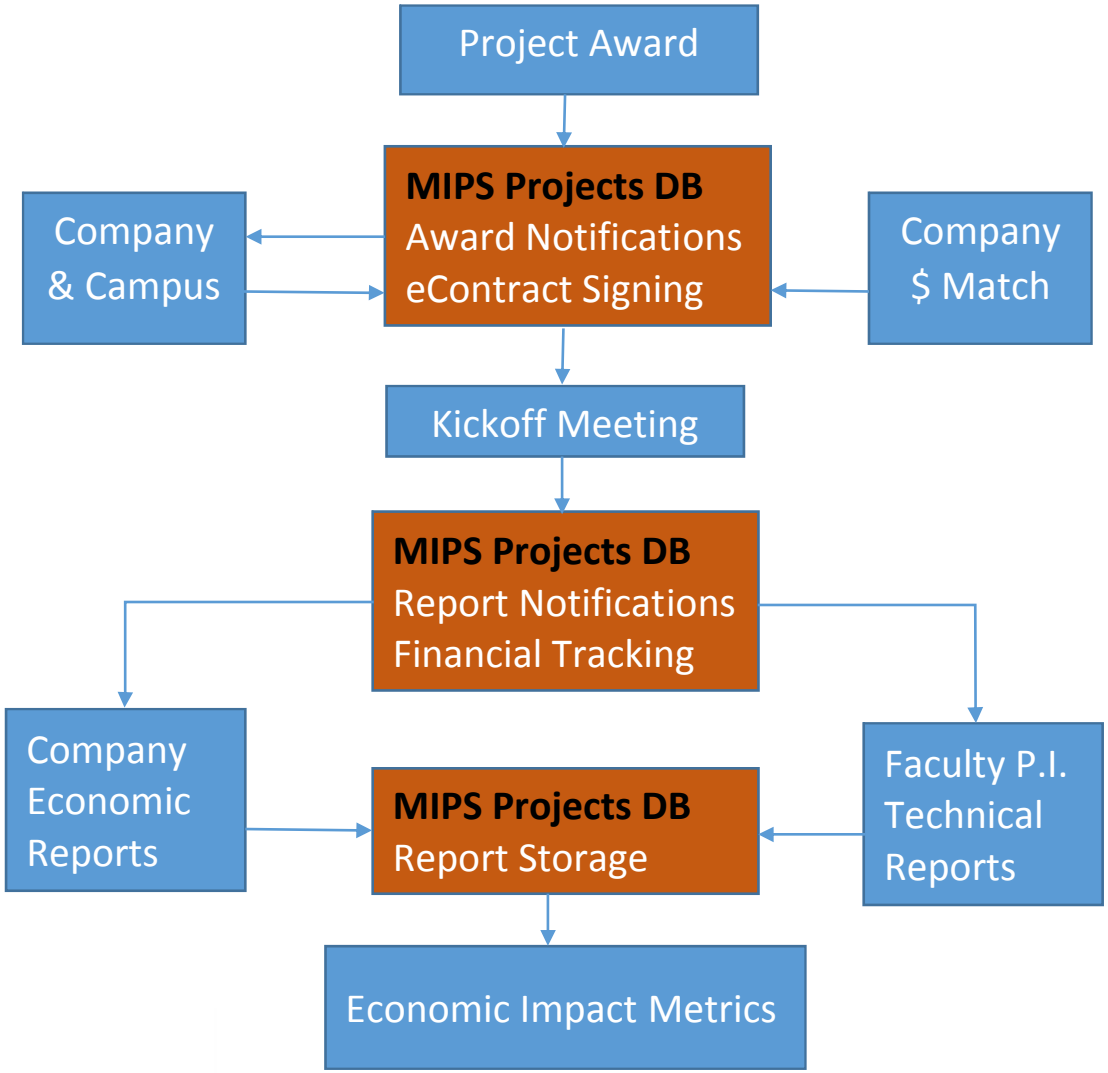
Proposal Evaluation Process

- Scientific/technical evaluation
- **Business/economic review**
- 60 day turnaround from application to award
- 2 funding cycles per year, May and October deadlines
- Proposals due: **May 1 and October 15**

Proposal & Review Process



MIPS Project Management



Benefits to Companies

- Financial support for commercially applicable research
- Leveraging assets/ outsourcing R&D
- Access to university
  - faculty & students expertise
  - facilities, as used by faculty & students
- Companies can establish lasting relationships with faculty experts, hire students

Intellectual Property

- Company has option to an exclusive license, if new I.P. is created by the university research team during the course of the MIPS project
- Terms negotiated with campus after the invention
- Projects are allowed to further develop company-owned I.P., not only university-owned I.P.

Program Summary

Sixty-four Competitive Rounds

- 2356 Applications Received
- 1272 Different Contracts & Amendments
- 877 Individual Projects
- 615 Companies
- 451 Faculty

Round 63 – MIPS Projects

Phase 1 – New Project

• 38 North, LLC *	Assessment of Promoters in Oyster Yields
• AlgaBT LLC	Microalgae Fermentation for Astaxanthin Production
• ATOLLO	Integrated Cyber & Physical Security for Smart Homes
• Cykloburn Technologies *	Pilot-scale Space Heating System for Poultry House
• IES Life Sciences, Inc.	Interferon Subtypes In Herpes Patient Blood
• Liatris, Inc.	Industrial insulation Using Low-Cost Nanopore Foam
• Living Canopies	Development of Smart Solar Irrigation Controller
• Maritime Applied Physics *	Automated Oyster Aquaculture with Solar Energy
• Oyster Master *	Oyster Master
• PneumoNIX Medical, Inc.	Preventing Lung Collapse During Lung Biopsy
• Sisu Global Health	FDA Study of Auto-transfusion Device
• Smith Island Baking	Evaluating Cake and Cake Bite Product Composition

Phase II – Continuing Projects

• Abilis Life Sciences	Bladder Cancer Diagnostic Signature Validation
• Artgen Inc.	Novel Targeted Imaging Applications for PAD
• gel-e, Inc.	Hemostatic Foam for Minimally Invasive Surgery
• N5 Sensors, Inc.	A Digital System-On-Chip CO2 Sensor
• Nostopharma	Formulation Development for Bone Control Therapy

* Indicates DNR Award

Round 62 – MIPS Projects

Phase 1 – New Project

• Biotrophics	Enhanced Insect Production for Aquaculture Feed
• Blue Ocean Biosystems, Inc. *	Aragonite as a Waste Mitigant & Recovery Vehicle
• FireFly Farms, Inc.	Food Testing & Research for Scalable Production
• GreenScreen LLC	Healthcare Eligibility Services Tool
• Ion Storage Systems	Packaging of Solid State Batteries
• Manta Biofuel *	Improving Algal Growth via Probiotic Bacteria
• Mindandbuddy	Drug Delivery Contact Lens
• N. American Wave Engine Corp.	Control System for Wave Engine
• Primetime Life Sciences, LLC	Development of a Novel Treatment of Ovarian Cancer
• SilcsBio, LLC	Treatment of Leukemias with ART838 in Combination
• Solar Tech, Inc.	Optimizing Printable Solar Cell Technology
• VakSea	Oral Vaccine for Nervous Necrosis Virus
• VisiSonics Corporation	High Frequency Computational Acoustics for Audio

Phase II – Continuing Projects

• Metompkin Seafood, Inc. **	Advanced Techniques for Oyster Lease Profitability
• Icmed, LLC	Older Adult/Caregiver Mobile Support Solution
• xMD Diagnostics	Prototype for xMD Enrichment of Patient Biopsies
• Airgility, Inc.	HorseSHU UAV – Flight Control Development
• Johnny Oysterseed, LLC **	Developing an Improved System for Farming Oysters

* Indicates DNR Award
** Indicates $150k DNR Award

Round 61 – MIPS Projects

Phase 1 – New Projects

•305 Jeans, LLC	Using Wearable Technology for Mass Customization
•3i Diagnostics, Inc.	Bacterial Isolation from Blood via Nanogap Arrays
•Blue Ocean Biosystems	Oolitic Aragonite as Environmental Waste Mitigant
•Cellth Systems	Oncology Drug Screening via Tethered CTC Analysis
•Cykloburn Technologies, LLC (DNR)	Innovative Space Heating System for Poultry Houses
•HopFlyt	Electric VTOL Real-Time HIL Test Environment
•N5 Sensors	A Digital System-On-Chip CO2 Sensor
•New Ascent, Inc.	G-Ruggedization Materials for Sensitive Components
•Nostopharma, LLC	Formulation Development for Bone Control Therapy
•Pixelligent Technologies	Pixelligent Nano-Dispersion Characterization
•TRX Systems	Smart Wayfinding and Navigation Using 3D Location

Phase 2 – Continued Projects

•38 North, LLC (DNR)	Advancing Oyster Settlement for Aquaculture
•BondTrue, LLC	BondTrue Prototype Design and Development
•CoapTech, LLC	Evaluating a Novel Gastrostomy Procedural Method
•HY-TEK Bio, LLC (DNR)	Increase Methane in Chicken Manure Digesters
•Microsphere Material Solutions	Maturation of Amorphous Glass Foams Manufacturing
•Millennium Eng. & Integration	UAV Airborne Intelligent flight Management System
•VLP Therapeutics	VLPM01 Malaria Vaccine Development
•Whisker Labs, Inc.	Economic Demand Response Stochastic Optimization
•Zygood, LLC	Design Optimization of Magnetic Pain-Relief Device

MIPS Impact Data (1987-2018)

- **Performance of the Top Products MIPS Research Has Contributed to:**

Company	MIPS-Related Product	Revenue /Sales
MedImmune	Synagis: prevents RSV in infants	$18.0 billion
Martek Biosciences	Nutritional oils, primarily DHA, added to infant formula and other foods	$2.9 billion
Hughes Communications	HughesNet: satellite broadband	$18.7 billion
Total:		$39.6 billion

Maryland Industrial Partnerships (MIPS)

Matching grants for collaborative R&D projects between Maryland companies and University System of Maryland faculty to accelerate product commercialization

7,150
Current, direct jobs created

$40 billion
Revenue from top MIPS-supported products

$166 million
Annual tax revenues to the state from MIPS companies

23,000
Total jobs supported

600+
Maryland companies have used MIPS to develop products through 700 projects

$125 million
Annual tax revenues to counties from MIPS companies

38 to 1
Return on investment, per dollar, to the state

87%
MIPS-funded startups still in business five years later

63%
Of ALL MIPS-funded startups still in business since 1987

MIPS Startups

- Five-year survival rate: **87%**
- Of **all** MIPS startups funded since the beginning of MIPS in 1987, **63%** are still actively doing business in Maryland

Unrestricted MIPS funding: Status as of July, 2019

- FY20: total unrestricted project funding $1.36M
  - Mostly through UMCP budget
  - $300K State funds through TEDCO

MIPS-DNR Partnership

- Maryland DNR (Dept Natural Resources) grants through MIPS for past 10 years.
- DNR funded-projects to reduce sediment and nutrient run-off into the Chesapeake Bay, plus climate change mitigation
- 12 DNR projects are currently underway
- Currently $500K per year in restricted project funds

Keys to MIPS Success

- Engaging university faculty, students, and laboratory facilities in R&D of near-term interest to a company's future
- Requiring the companies involved to pay part of the project costs upfront
- Non-dilutive, non-debt funding for R&D
- Allowing projects to further develop company-owned intellectual property (I.P.), not only university-owned I.P.

Synagis

MedImmune/AstraZeneca: Gaithersburg, MD

- Now the 10th best selling biotech drug in the world (past sales approx $13.6 B)
- Used to prevent respiratory syncytial virus (RSV) disease in infants.
- 3100 employees in Maryland

Formulaid

Martek:
Columbia, MD

- Patented blending of nutritional oils (docosahexaenoic acid (DHA) and arachidonic acid (ARA), produced from microalgae
- Aids in the development of the eyes and central nervous system in newborns.
- Martek has licensed to 13 infant formula manufacturers representing more than 2/3 of the world's wholesale infant formula market. Company acquired in 2010.
- 95% of US kids under 5 have consumed this product
- $352M annual revenue, 100 employees in MD

HughesNet

Hughes Network Systems: Germantown, MD

- HughesNet is the world's leading broadband by satellite service. Formerly called DirecWay, DirectPC.
- More than 2.2 million systems ordered or shipped to customers in 100 countries.
- System based on design by Dr. John Baras, Professor of Electrical and Computer Engineering at UM College Park.
- $1.1B annual revenue, 1300 employees in MD, 400 attributed to MIPS

Revolutionary Mobile Health System for Chronic Diseases

WellDoc Communications: Baltimore, MD

WELLDOC®

- FDA Approved Diabetes Manager System
- 31 Employees in Baltimore City
  - ❖ Started with 3 employees at time of crucial first funding from MIPS in 2007
- MIPS sponsored initial pilot study / clinical trial of WellDoc's system
  - ❖ Trial showed major benefits for diabetes patients
- Company poised for further growth as leader in mobile/I.T. health management for diabetes and other chronic diseases

Web Site and Contacts

- MIPS Web site: www.mips.umd.edu

- Joseph Naft, Director MIPS
  jnaft@umd.edu; 301-405-3886

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BOARD OF REGENTS

SUMMARY OF ITEM FOR INFORMATION

TOPIC: USM Office of Economic Development Update

COMMITTEE: Economic Development and Technology Commercialization

DATE OF COMMITTEE MEETING: Thursday, September 12, 2019

SUMMARY: Vice Chancellor Sadowski will provide an update of USM Economic Development office activities to include- review of Committee Objectives, Overview of the office's plan for 2020, focus on Industry Partnerships / Sponsored R&D, Workforce Development, Legislative Matters, and the latest USM Venture Development Report.

ALTERNATIVE(S): This item is for information purposes.

FISCAL IMPACT: There is no fiscal impact

CHANCELLOR'S RECOMMENDATION: n/a

COMMITTEE RECOMMENDATION: DATE:

BOARD ACTION: DATE:

SUBMITTED BY: Tom Sadowski (410) 576-5742

USM Economic Development

Briefing for Regents Committee for Economic Development Tech Commercialization

June 12, 2019

University System of Maryland

USM Board of Regents

Committee on Economic Development and Technology Commercialization

Presentation Summary:

- Committee Objectives and 2020 Overview
- Industry Partnerships / Sponsored R&D
- Workforce Development
- Legislative Matters
- USM Venture Development Report

University System of Maryland

USM Board of Regents

Committee on Economic Development and Technology Commercialization

The University System of Maryland (USM) created the Board of Regents Committee on Economic Development and Technology Commercialization in July 2011 in recognition of the increasing importance of translational research, entrepreneurship and innovation, and the supply of skilled workers in STEM fields for the State of Maryland. The Committee, working with the Vice Chancellor for Economic Development, provides strategic leadership for the USM's economic and workforce development, technology commercialization, innovation and entrepreneurial initiatives.

University System of Maryland

USM Board of Regents

Committee on Economic Development and Technology Commercialization

Strategic Objectives:

- Strengthen the USM entrepreneurial ecosystem
- Align resources with market demand
- Leverage USM resources through collaborations
- Engage the investment community and enhance access to capital for USM affiliated startups and innovators
- Enhance partnerships with industry, state and federal entities

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USM Economic Development Strategy 2020

TALENT

- Enhance Workforce Programs (internships, apprenticeships and credentialing)
- Support pursuit or reauthorization of federal/state funding

CAPITAL

- Foster Momentum Fund Success
- Develop Sources of Earlier Capital
- Leverage Fed Opportunity Zones
- Enhance support for government / industry collaborations (MIPs, SBIR, etc.)

CULTURE

- Leverage and Expand R&D Partnerships
- Amend IP and Tech Transfer Policies as required

PLACE

- Leverage Fed Opportunity Zones
- Advocate for Enhancement of Place-Based Programs (RISE Zone/Opportunity Zones)

MARKETING

- Tell the USM Story (events, press, social media)
- Enhance Institutional Capacity to promote good news/strengths/opportunities (“Open for Business”)

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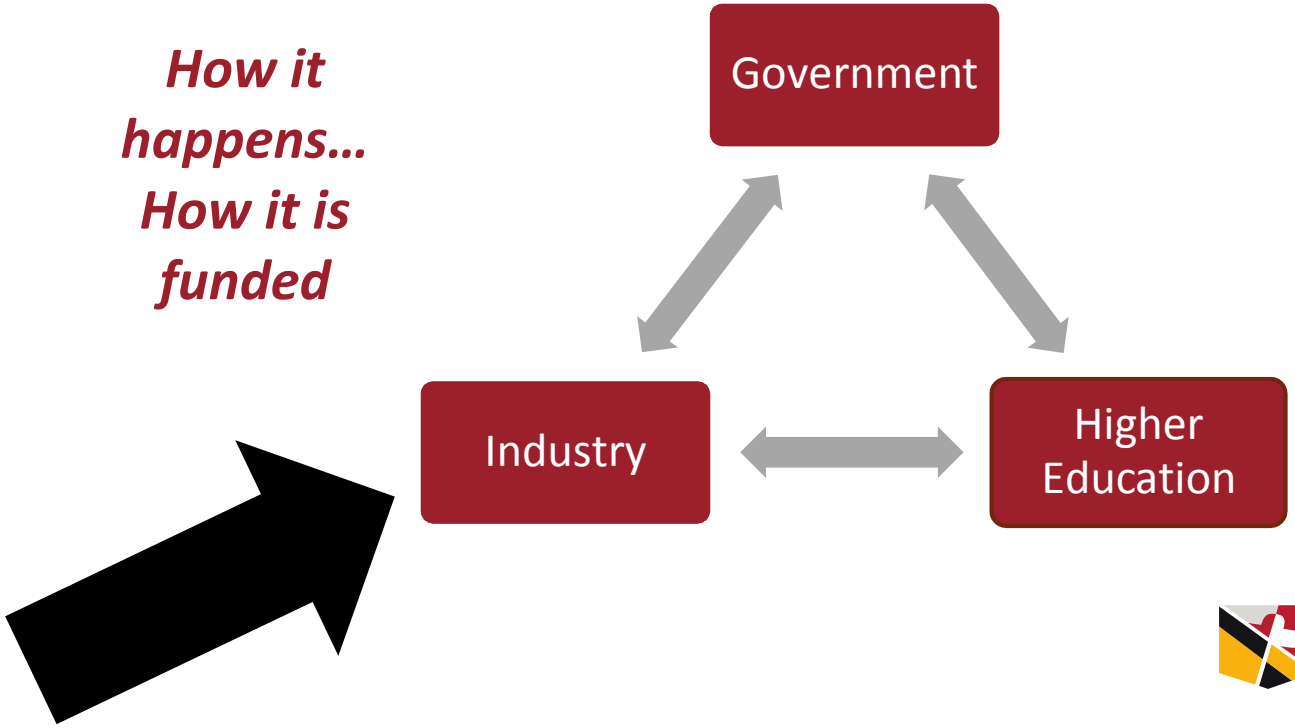
USM Industrial Partnerships
Innovation Equation

How it happens… How it is funded



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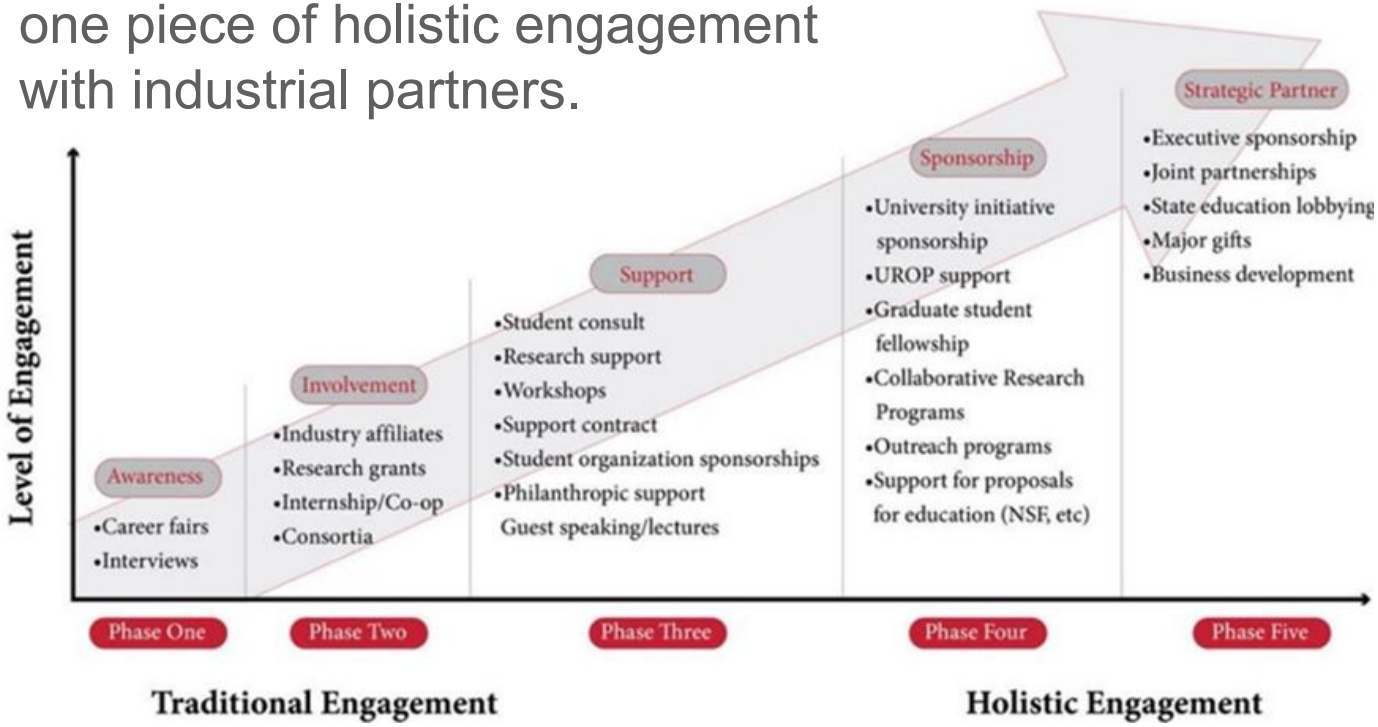
USM Industrial Partnerships

Scope

Focusing research partnerships, just one piece of holistic engagement with industrial partners.



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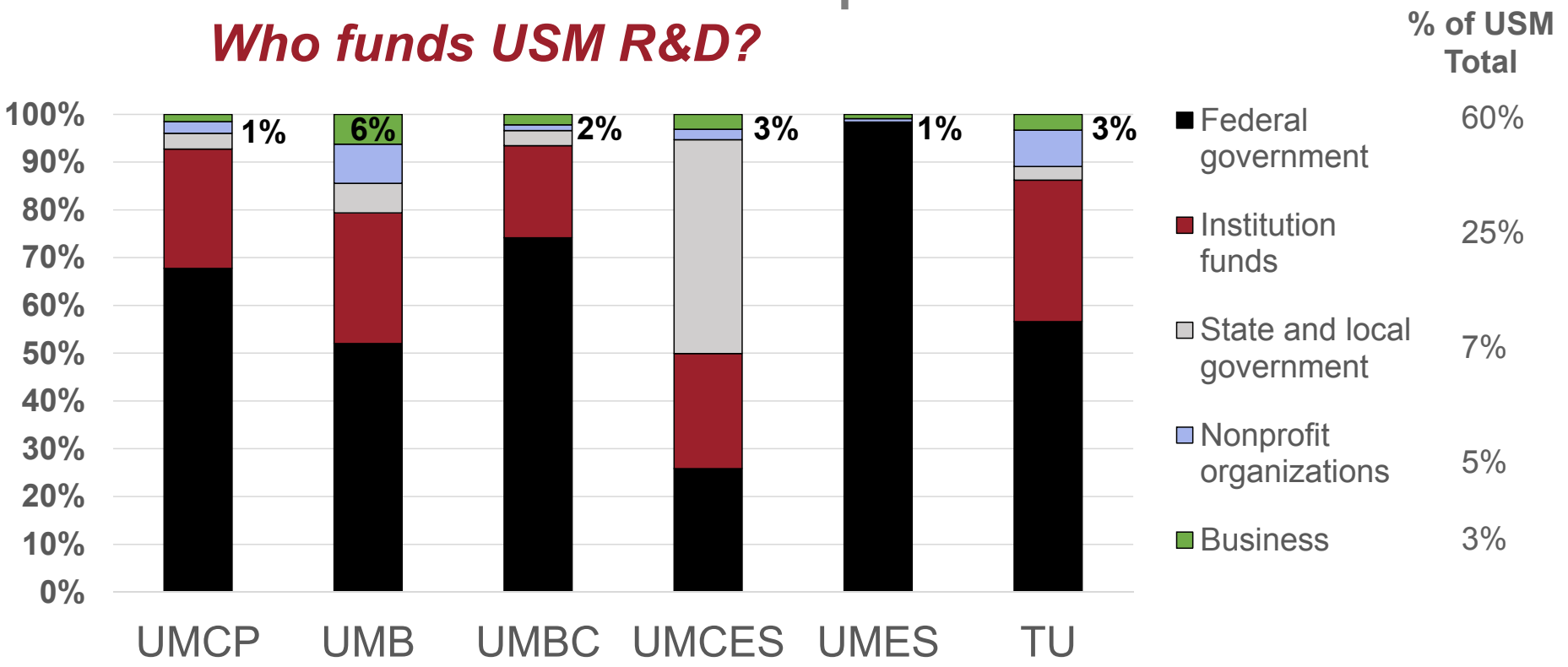
Who funds USM R&D?



~ 90% of USM R&D is funded by USM or government bodies

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Source: NSF HERD Survey FY 2017

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USM Industrial Partnerships

The Future of USM R&D

Lack of funding diversification leaves the USM research enterprise vulnerable. **However, there is room to grow industry-funded R&D.**

- **Peers have been successful,** averaging between 7-17%, compared to 3%.
- **Industry has R&D funding**. In the U.S., about 65% of R&D is *funded* by industry. Industry also finances most European R&D.[1]
- **Industry is increasingly looking to external R&D collaboration**. U.S. businesses *perform* about 70% of R&D[2]. There is a growing trend toward external collaboration.[3]
- **USM is important to the future of Maryland's R&D.** Maryland is not rife with industry R&D. Must seek outside partners but also incentivize current businesses and help attract/retain new players (e.g., Amazon).[4]

1: UNESCO eAtlas of Research and Experimental Development https://www.tellmaps.com/uis/rd/?subject=-659373586&lang=en. 2017 data.
2: Same as above, https://www.tellmaps.com/uis/rd/?subject=-656659820&lang=en.
*3: Innovation Research Interchange's Annual Survey 2019 R&D Trends Forecast. W*ith increased interest in R&D alliances (63%), R&D consortia (34%), contracts/grants with academia (28%), and licensing (19%)
4: National Science Foundation 2016 data. Maryland ranks 19th in the U.S. for total industry R&D performance with industry performing $5.7B in 2017 compared to universities' $3.8B

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USM Industrial Partnerships
A Closer Look

Current USM/Industry R&D Partnerships
- With the exception of large centers, most work with industry is driven by the interest of the Principal Investigators -- will always be a key element!
- Steps to increase research partnerships are being taken across our research institutions.

Examining New Approaches to Strategically Increase Partnerships
- Better understand our institutions' successes and challenges.
- Examine best practices from peers.

Affects Reach Beyond R&D
- Attract and retain superstar faculty
- Attract, retain, and train a workforce ready for the modern workplace

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Workforce Development

USM Workforce Initiative
- Governor has included year-two funding of $20 million in FY '20 budget
- USM institutions proposal submitted leveraging areas of strength for enhancement of STEM programming
- Looking at employer needs and possibility of establishing USM "outposts" where necessary (e.g. Amazon)

NOTE: Lockheed Martin projects hiring of >50,000 engineers in Maryland over next 10-years.

Internship, Certification and Apprenticeship/Co-op Program
- Taking inventory of industry workforce demands in key sectors (Aviation, cyber, life sciences/bio-mfg)
- Working with MD Commerce and DOL to convene major employers and host "listening sessions"
- Pursuing Federal Grant opportunities for apprenticeship programs to meet current/emerging industry demand

NOTE: MICROSOFT Corporate VP of Cybersecurity estimates global cyber/IT professional shortfall will reach 3 million within the next 3-4 years

Greater Washington Partnership CoLAB Initiative
- Working with Capitol-region employers and higher ed institutions on IT Generalist / Specialist credential
- USM Kirwan Center developing plan for USM effort and potential national roll-out via EdX

MD Tech Internship Program
- 65 employers from 9-counties participated; 65 students from 15 institutions participated (3.4 avg GPA)
- 80% of students reported increased exposure to tech careers; 90% stated they plan to stay in MD to pursue their career
- Working with TEDCO to infuse MD STEM Cell Fund resources to expand STEM specific internship opportunities

2020 Legislative Session

MD Technology Infrastructure Fund 2.0 (formerly EXCEL Maryland)

- In 2019, $16 million included in Governor's budget to initiate program; proposed enhancement of TEDCO authority
- Industry targeted for match 3-4x to state funding
- House rejected bill last session
- Looking at alternative approaches in collaboration with MD Commerce, JHU and legislature

Regional Institution Strategic Enterprise (RISE) Zone

- Dept of Legislative Services report recommends enhancement to RISE Program to best meet local jurisdiction interests – from property tax credits to support for startups and innovation activity
- Propose amendment of RISE Zone program possibly to act as strategic layer to ***federal opportunity zone*** program to incent attraction/retention and growth of USM startups and catalyze collaborations with industry and government partners

Maryland Tech Internship Program

- Work with Admin/legislature to enhance funding after successful roll-out of program

Maryland Industrial Partnerships (MIPs)

- Looking for supplemental funding opportunities (internal/external)

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USM Venture Development Report
Background

- Goals:
  - Better understanding for better practice
  - Better "Telling of the Story"

- "USM Venture Development – Company List" now includes data governance to allow for more actionable sharing and outreach.
- Frist "USM Venture Development – Resource List" collection underway to be presented next meeting.
- Currently excludes SBDC. More active integration with SBDC data in process.
- Pursuing ongoing economic impact analysis of USM startup activity as opposed to retrospective.

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USM Venture Development Report
Baseline – 1st Year of Collection

	2nd Half 2018	1st Half 2019
# Companies Added to USM Portfolio	**45**	**53**
Minority-Owned	33%	33%
Woman-Owned	25%	26%
USM Founder	24%	35%
IP-Based*	20%	22%
# Current Portfolio Companies Re-Engaged	**15**	**19**

**On track for ~ 20 IP-based startups per year*

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USM Venture Development Report

1st Half 2019: 53 Companies New to USM

Examples from January-June 2019

- **Savvy Tech*** – An app that allows shoppers to try on and purchase designer clothing in a virtual marketplace. UMBC and UMCP undergrad founders. Terp Startup: program, $, and WeWork access.
- **Valkyrie Software Solutions** – Accessibility software company in the videogames industry. SU undergrad founder Shore Hatchery participant and micro-resident.

Industries

Health / Life Science	26%
Cyber, IT, and Educational Technology	19%
Advanced Materials, Energy, and Environmental Technology	15%
Services/Consulting	13%
Retail / Consumer Product or Service	11%
Agricultural Technologies	8%
Others	8%

In their first six months of interacting with USM…

32 companies joined an incubator or other space
25 companies received capital
24 companies participated in a program

23 companies (43%) leveraged more than one type of USM resource!

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**More info at: https://dingmanblog.com/2019/07/09/terp-startup-savvy-tech-is-developing-an-app-for-trying-on-clothes-virtually/*

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USM Venture Development Report

1st Half 2019: USM-Affiliated Capital Deployed

Source of Capital		Amount Deployed	# Companies
Momentum Fund	$	1,200,000	3
MII Investment	$	450,000	3
Other Equity Investment	$	300,000	1
MIPS Funding	$	974,943	16
Other Non-Dilutive Capital	$	253,450	24
TOTAL CAPITAL DEPLOYED	**$**	**3,178,393**	**46**