UNIVERSITY SYSTEM of MARYLAND

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WWW.USMD.EDU // 301.445.2740

OFFICE OF THE VICE CHANCELLOR FOR RESEARCH AND ECONOMIC DEVELOPMENT

USM Board of Regents
Committee on Research and Economic Development
January 31st, 2024
Zoom

AGENDA **10:30 a.m.**

Call to Order **Bill Wood**

1. Approval of the minutes – Regent Wood
2. Economic Development
    - Venture Development - Executive Director of Economic Development – Lindsay Ryan – Executive Director of Economic Development, USM
    - Major Programs and Resources for Commercialization and External Engagement Report Outs from working groups - Lindsay Ryan – Executive Director of Economic Development, USM
    - Technology Commercialization and UMB – Associate Vice President, Office of Technology Transfer and Executive Director of UM Ventures, Baltimore, Phil Robilotto
    - Maryland Momentum Fund Update – Managing Director of the Maryland Momentum Fund, Mike Ravenscroft
3. University of Maryland, Baltimore County Enterprise Research – Vice President for Research and Creative Achievement, Karl Steiner
4. Recognition of Research Innovation Excellence – Discussion
5. Questions and Answers

USM Board of Regents
Committee on Research and Economic Development
December 10th, 2024
Zoom

Call to Order: Regent Wood called the meeting of the Research and Economic Development Committee of the University System of Maryland Board of Regents to order in public session at 10:32pm on Wednesday December 10th, 2024, via Zoom.

In attendance:

Regents: Michele Masucci, Bill Wood, Kevin Anderson, Linda Gooden, Clifton Griffin, Denise Wilkerson, Julia Chadwick, Michael Ravenscroft, Mike Jensen, Lindsay Ryan, Sarah Sheppard, Dave Mosca, Jay Perman, Susan Lawrence, Anwer Hasan, Yehuda Neuberger, Elena Langrill, Phil Robilotto

Audience: 21 attendees in the audience.

Agenda:

1. **Approval of Minutes.** Regent Wood called a vote to approve the minutes from the October 29th meeting of the Board of Regents committee on Research and Economic Development. Regent Anderson motioned to approve the minutes, and Regent Gooden seconded. The motion carried unanimously.

2. **Research Roundup.** Vice Chancellor Michele Masucci updated the USM on research and economic development initiatives, including the Nov. 27 Tedco Expo, Bowie State's Entrepreneurship Innovation Center being Highly Commended by the Global Consortium of Entrepreneurship Centers, and recent grants awarded to UMCP, UMCES, Bowie, and

UMBC. She also discussed progress with the USM External Engagement Task Force, the Major Resource Programs and Ventures group, and improvements in grant administration led by Julia Chadwick. Additionally, she shared preliminary research expenditure data. Meeting materials are publicly available on the USM website.

   a. **Regent Wood and Vice Chancellor Masucci shared with the committee the idea to host a USM-wide Awards and Recognition event for excellence in research, discovery, and innovation at the system level. The committee was favorable to the idea, and a follow-up meeting will take place to discuss specifics.**

3. **Salisbury Enterprise Research.** Dr. Clifton Griffin presented Salisbury University's enterprise research to the RED Committee, highlighting five years of research and development expenditures and awards, ten years of Maryland Industrial Partnerships (MIPs) awards, and the economic and student impact of the Student Research Office of Undergraduate Research and Creative Activity. He also provided updates on Salisbury's undergraduate research journal *Laridae* and the new Graduate School. Meeting materials are publicly available on the USM website.

   a. **NSF EPIIC Grant.** Mike Jensen presented Salisbury University's recent recipiency of an NSF EPIIC Grant to the RED Committee. The grant is in its second round, with $380k being the amount received by Salisbury to be used researching Artificial Intelligence. The project is a 3-year project called Rural AI Solutions and Engagement (RAISE). All meeting materials are available to the public on the USM website.

4. **Economic Development.** Executive Director of Economic Development Lindsay Ryan, and Associate Vice President of the Office of Technology Transfer and Executive Director of UM Ventures, Baltimore Phil Robilotto both had their presentations postponed until next RED Committee meeting due to time constraints. Regent and Secretary Kevin Anderson shared an overview on the Maryland Economic Council (MEC) October 2024 Report. This

overview broke down the key recommendations from the MEC report into 9 major points, from reducing corporate tax rates to enhancing legislative advocacy. All meeting materials are available to the public on the USM website.

a. **Regent Gooden requested that the full MEC report be shared with the RED Committee.**

Action items:

1) Minutes from the 10/29/2024 RED Committee meeting were approved to move forward to the next full board meeting.

2) The RED Committee will schedule a time in the near future to meet to discuss the logistics of putting on a USM-wide Research, Discovery, and Innovation Awards and Recognition event.

3) The full MEC Report to be shared with the RED Committee.

Adjourned: Regent Wood gave his closing remarks and adjourned the meeting at 12:10 p.m.

USM Innovation Collective

Lindsay Ryan
Executive Director of Economic Development
January 31, 2025

University System of Maryland

USM Invention, Innovation, and Entrepreneurship Support

USM OVCRED re-convened USM leaders supporting invention, innovation, and entrepreneurship in November.

The group was challenged to characterize USM's collective support, success, and future directions.

A summary of this work follows.

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A Strong Base

Education

- All 12 institutions support students of all ages with innovation and entrepreneurship education.
- Many provide venture development training and capital through competitions.

Discovery to Creation and Impact

All 12 institutions create environments that foster discovery, invention, and creation, with pathways for impact.

USM Innovation Collective
Excellence

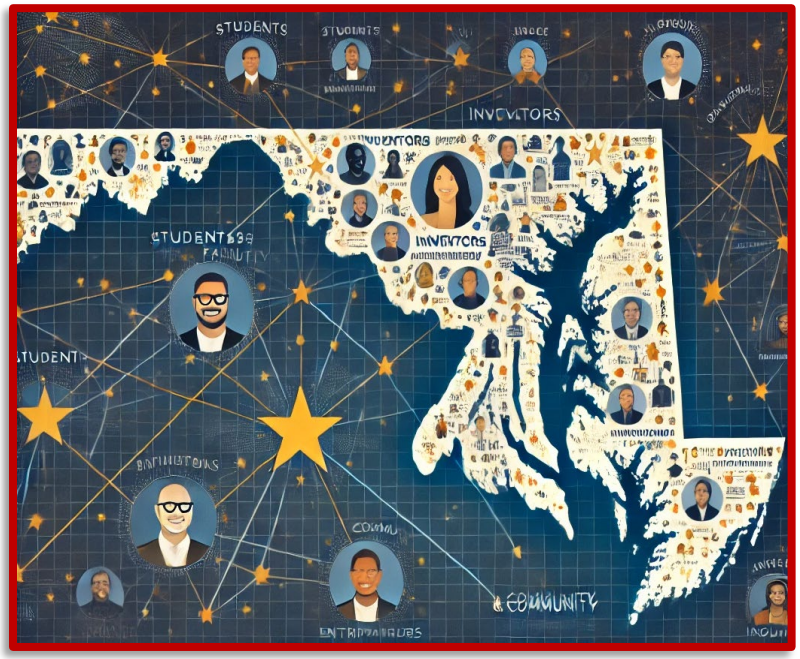
The **USM Innovation Collective** is the constellation of resources that support inventors, innovators, and entrepreneurs.

For the Good of ALL Marylanders

- Student, faculty, community
- Developing human capital
- Trusted access, public benefit

Varied, Distributed, Connected

- Industry, geography, ventures
- USMO-connected leaders
- Resilient, effective, efficient



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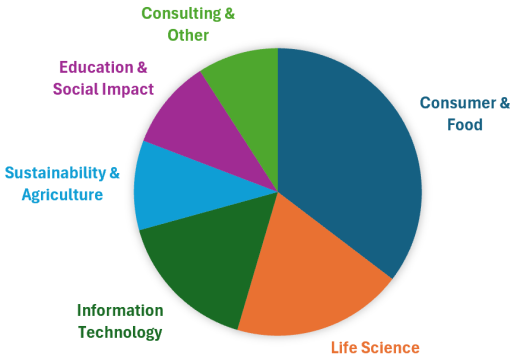

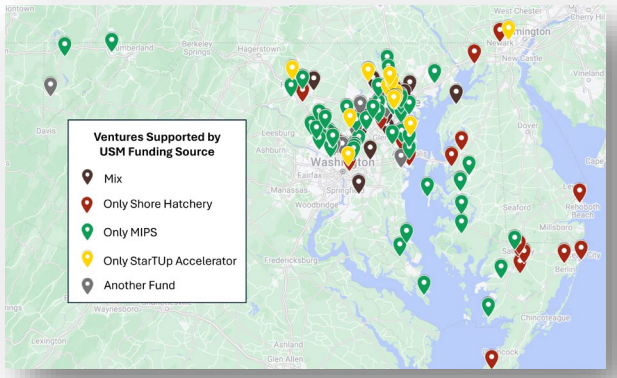

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Online Guide: https://marylandentrepreneurhub.com/guides/university-system-of-maryland-resources

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- **Funding-Forward Support.** Includes the Launch Fund, Momentum Fund, Dingman Angels, Maryland Industrial Partnerships, and Chesapeake Bay Seed Capital Fund

- **Bolstering Local Economies.** Includes the Baltimore Fund, Discovery Fund, StarTUp Armory and Accelerator, SU Shore Hatchery, and Incubators, Research Parks, and Innovation Districts

- **Discovery, Innovation in Focus.** Includes the Quantum Startup Foundry, U.S. Harmful Algal Bloom Control Incubator.

Several **university-affiliated individuals across multiple universities:** Maryland and Baltimore Innovation Initiatives; IMET Ratcliffe Environmental Entrepreneur Fellowship; UMB/UMBC NIH REACH Hub

USM Innovation Collective

Impacts of Excellence by the Numbers

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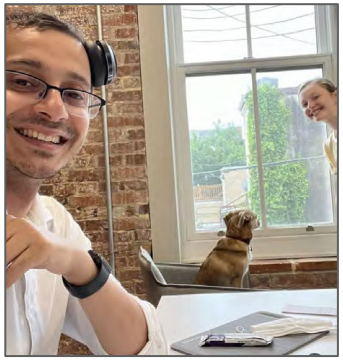
Emergency Health

https://kalocyte.com/

Mustafa Al-Adhami of Astek Diagnostics
Global Health



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USM Innovation Collective
Moving to Preeminence

- Grow research-to-impact capacity in alignment with research growth
- Maintain connectivity through growth of the USM Innovation Collective
- Explore partnerships with philanthropic and private sector partners in and outside of Maryland

APPENDIX

Venture Development Report January – July 2024

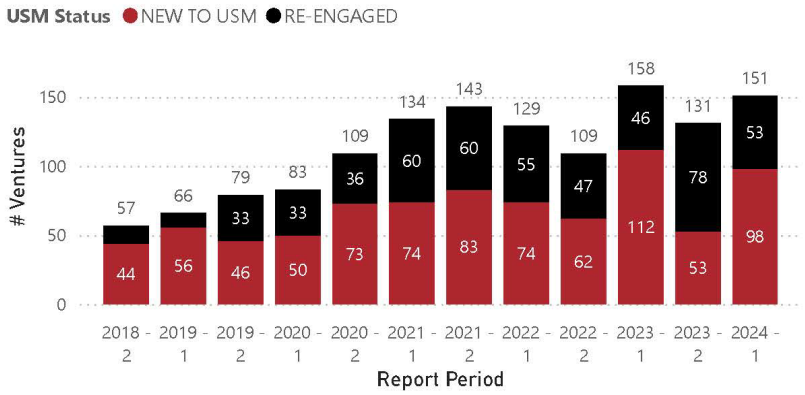
University System of Maryland

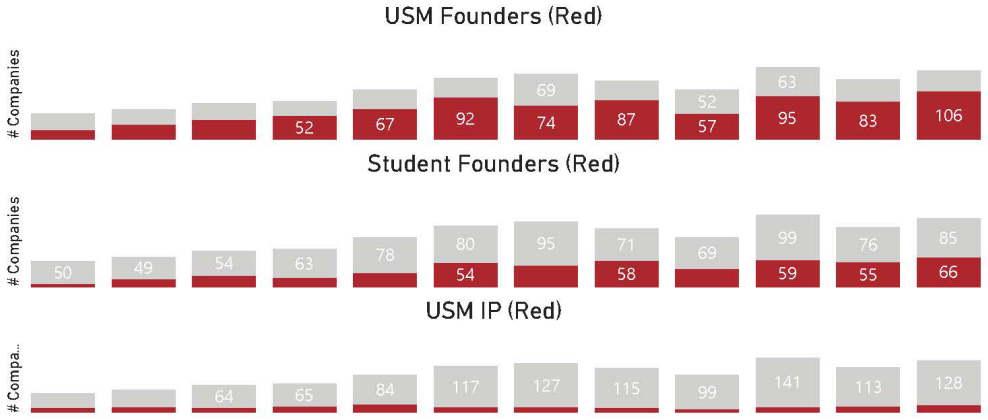
University System of Maryland

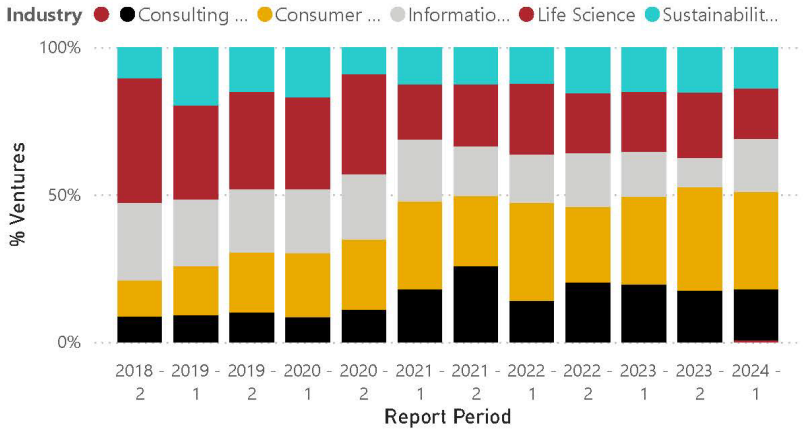
Ventures Supported

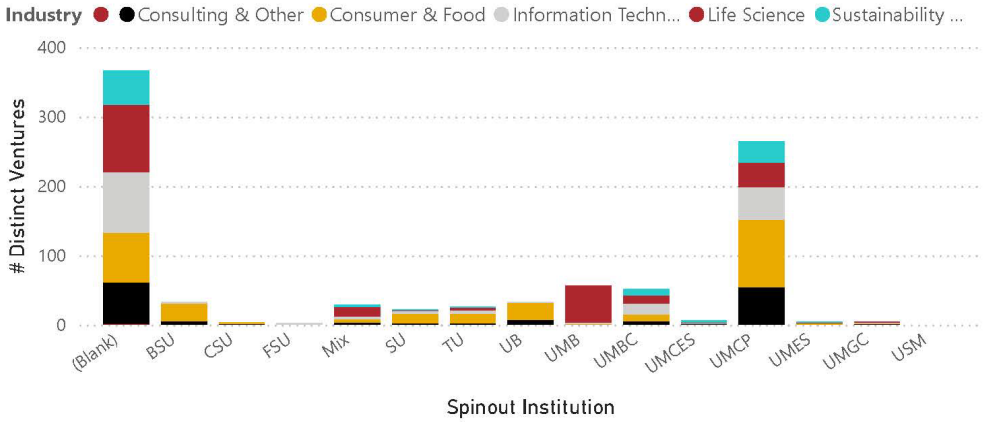
USM Status: All

Report Period: All









University System of Maryland

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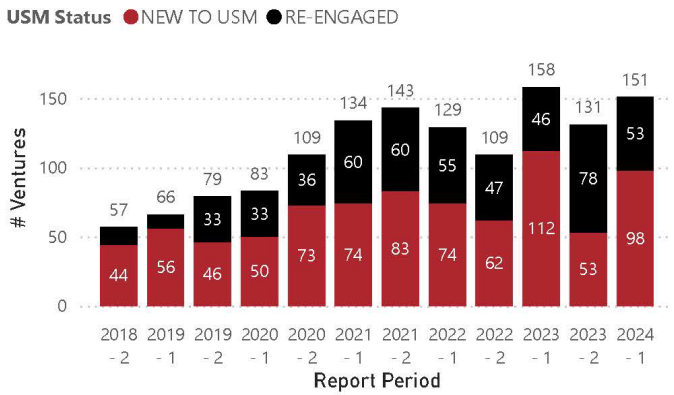
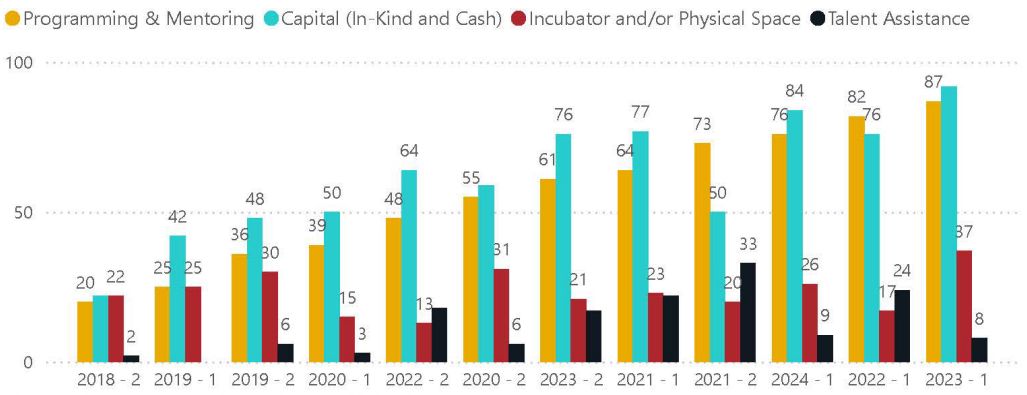
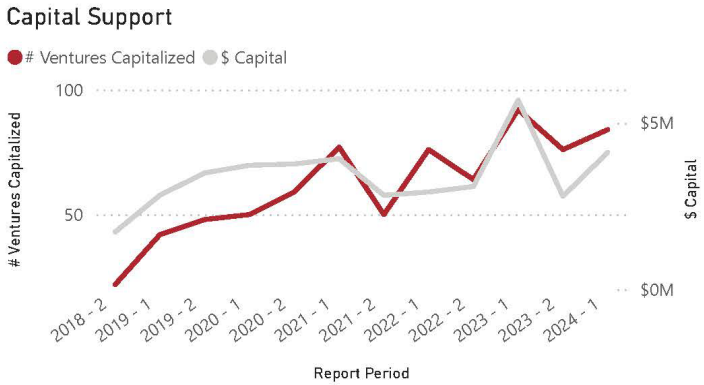
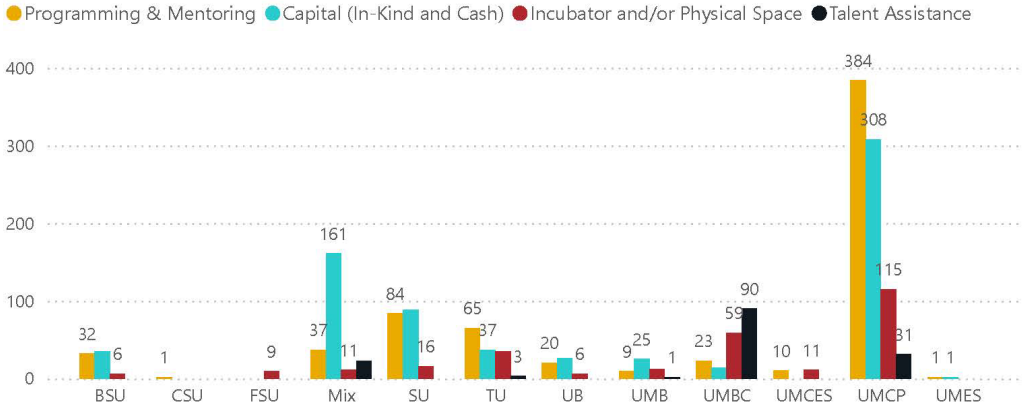








Additional State-Wide Venture Support

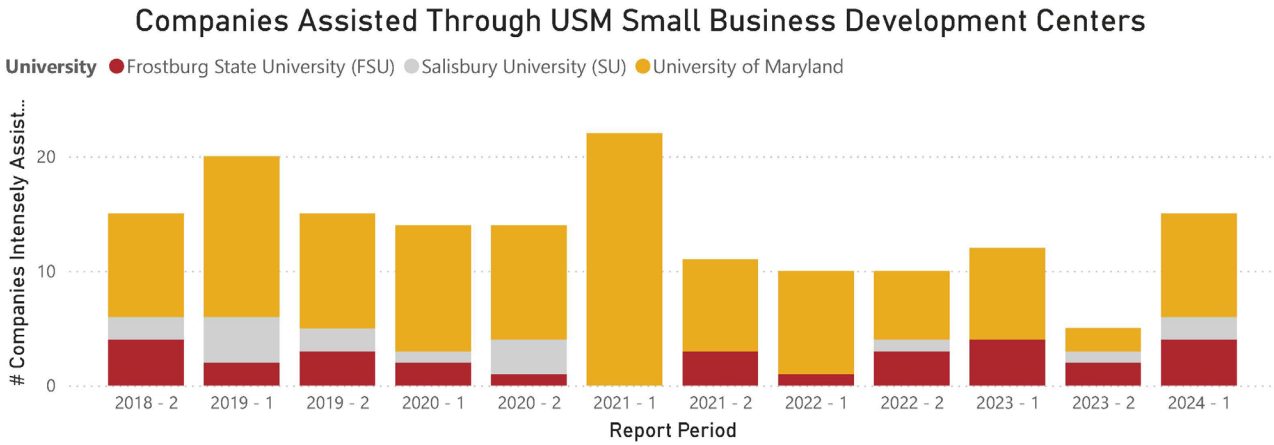
MARYLAND TECHNOLOGY INTERNSHIP PROGRAM

Helps Maryland retain top tech talent by increasing the number of paid technical internships offered in the state. Administered by UMBC and funded by the State of Maryland, the program offers financial assistance to technology-based businesses, as well as state and local agencies, to hire more interns (mtip.umbc.edu).

About 30% of startup participants also are USM "spinouts" or "spin-ins".

AMERICA'S SBDC MARYLAND

The Maryland Small Business Development Center (SBDC) is a public-private partnership between the U.S. Small Business Administration, the State of Maryland and UMCP. The Maryland network hosts entrepreneurial assistance programs at a number of USM institutions.



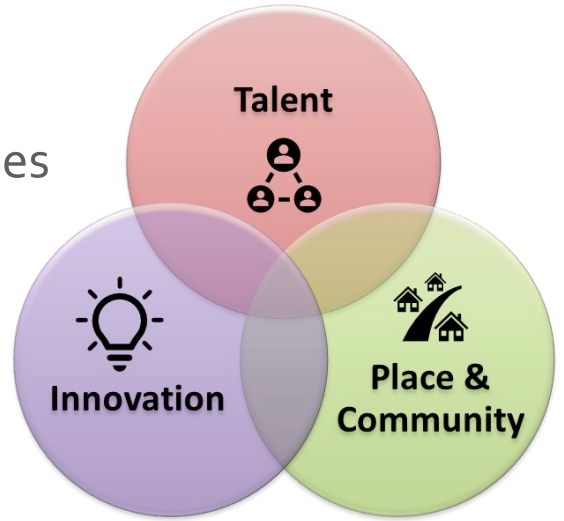
USM External Engagement Task Force

Lindsay Ryan
Executive Director of Economic Development
January 31, 2025

University System of Maryland

External Engagement Strategy
Why & What

- **Prepare for and Create Opportunities**
- **Further the Goals of the USM Strategic Plan.** Requires Industry Advisory Board
- **Build Connective Tissue.** Intentional interfaces with external partners – large, small, public, private
- **Enable Flywheel Partnerships.** Leverage university assets (examples below) for partnerships that generate economic development and improve those assets.



Adapted from the Association of Public and Land-grant Universities, accessed on 01/23/24

External Engagement Strategy
Task Force Charge and Inputs

Examine strategic industries of importance to Maryland – their challenges and opportunities – and to make recommendations for System-level infrastructure or initiatives (*if any!)* that could lead to economic development and mutually beneficial partnerships in those industries. While economic development in Maryland is a primary objective, potential partners and activities were not restricted to Maryland.

Inputs:

- Short-term and long-terms challenges and opportunities in industries of importance to Maryland (with the Maryland Department of Commerce Office of Strategic Industries and Entrepreneurship)
- USM R&D strengths and assets; best practices in multi-institution external partnerships in research, innovation, workforce, economic development.

Looking toward the future, understanding the realities of today!!

External Engagement Strategy
Task Force Members

Gail Bassette, Director of Economic Development and Strategic Engagement (BSU)

Michael Jensen, Executive Director of Entrepreneurship (SU)

Sidd Kaza, Associate Provost and Dean of Graduate Studies (TU)

Caroline Baker, Assistant VP, Careers & Corporate Partnerships (UMBC), now Executive Director of Development, University Corporate Relations (UMCP)

Dean Chang, Chief Innovation Officer and Associate Vice President for Innovation & Entrepreneurship and Economic Development *co-member with* Eric Chapman, Associate Vice President for Research Development (UMCP)

External Engagement Strategy
Landscape Analysis

- Nationally, System-level efforts are targeted, not comprehensive
- Nationally, multi-institution workforce and R&D efforts are often part of broad state efforts such as innovation consortia
- USM's startup infrastructure is robust, but one piece of larger needs
- R&D plays a larger role in Maryland's economy than in most states (https://ncses.nsf.gov/indicators/states/indicator/rd-performance-to-state-gdp/), but it is focused in the public and academic sectors, with private industry R&D output in Maryland much lower than the national average (https://ncses.nsf.gov/indicators/states/indicator/business-performed-rd-to-private-industry-output/)

External Engagement Strategy
Process

- New connections were formed from task force work

- Students can generate great ideas! -- *Thanks to Shantel Frederick & Barry Ormond of UMD's Smith School of Business, instructor Roy Thomason*

- Confirmed desire for System-level coordination (internal/external)

Next steps for OVCRED: Seek wider input from across USM, potential partners; incorporate learnings from Task Force into activities, strategy

External Engagement Strategy
Task Force Recommendations

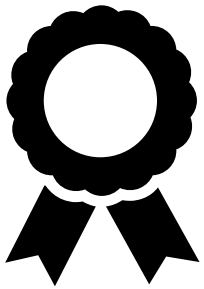
1. Build Capacity and Strategy Infrastructure
2. Bolster Existing Engagement Excellence
3. Facilitate Connections
4. Make Partnering Easier
5. Launch Multi-Faceted Initiatives Advancing Specific Maryland Pre-Eminence

External Engagement Strategy
Task Force Recommendations

1. **Build Capacity and Strategy Infrastructure**
    a. External Engagement Advisory Board
    b. USM Council for Research and Economic Development
    c. USM External Engagement Leadership Development

External Engagement Strategy
Task Force Recommendations

2. **Bolster Existing Engagement Excellence**
    a. Support Federal Agencies Amidst Transition
    b. Scale Hiring Best Practices for Economic Impact
    c. Scale Purchasing Best Practices for Economic Impact



University System of Maryland

External Engagement Strategy
Task Force Recommendations

3. Facilitate Connections

a. Formalize USM's Research and Innovation Networks

Includes connecting USM researchers, then potential partners; strengthening the Innovation Collective

b. Elevate USM's Research and Economic Development Capacity and Impact

Includes developing tools to better understand and communicate strengths; USM-level recognition

External Engagement Strategy
Task Force Recommendations

4. Make Partnering Easier

a. Enhance R&D Collaboration Vehicles

Includes building on startup success, augmenting for medium/large partners; streamlining administration and policies; and optimizing for System-wide growth

b. Enhance Workforce Collaboration Vehicles

Includes opening new or amplify existing channels for employer engagement; scale the Maryland Technology Internship Program and other workforce programs

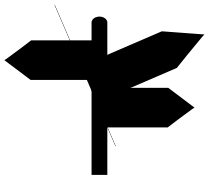
University System of Maryland

External Engagement Strategy
Task Force Recommendations

3. **Launch Multi-Faceted Initiatives Advancing Specific Maryland Pre-Eminence**

   a. Resilient Maryland

   b. Cybersecurity, AI, Quantum Tech (CAIQ)



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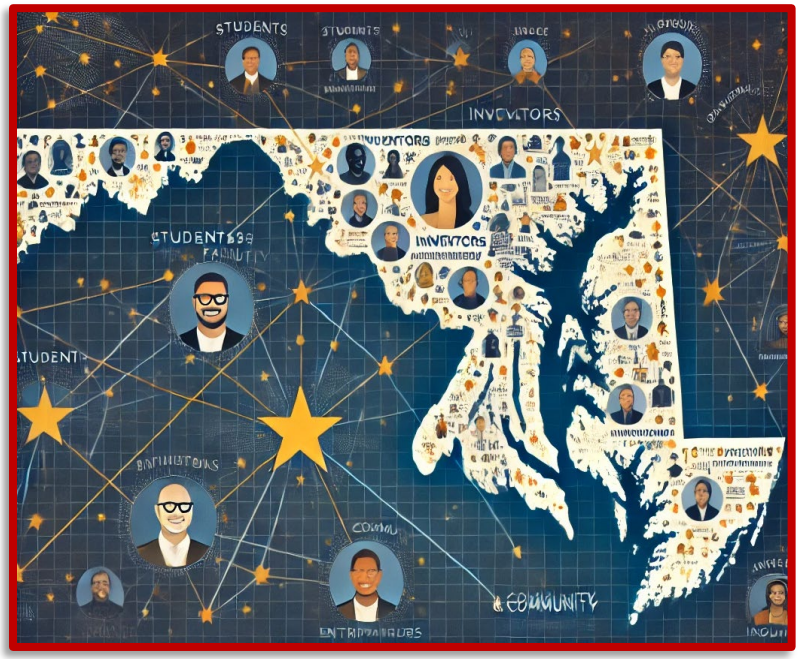

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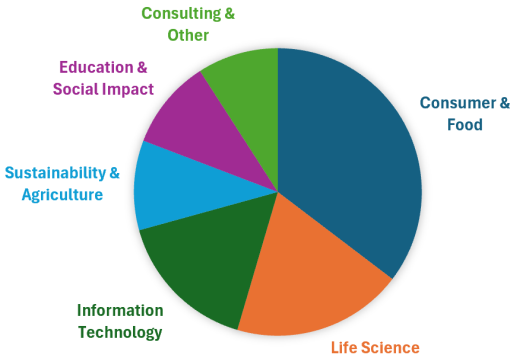

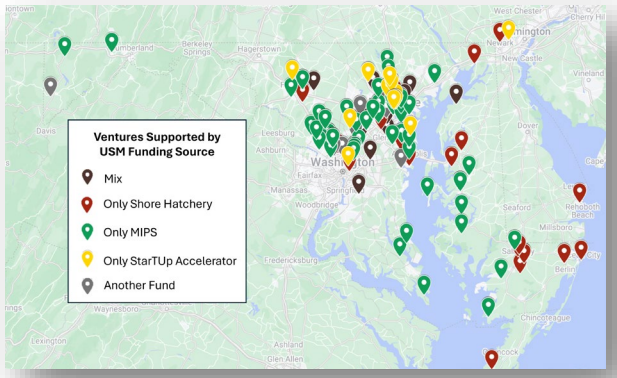

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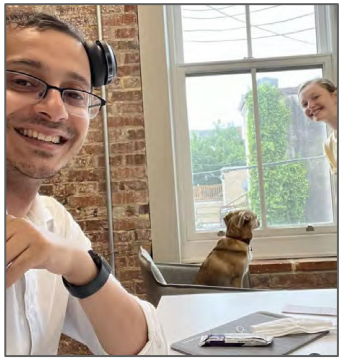

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APPENDIX

Venture Development Report January – July 2024

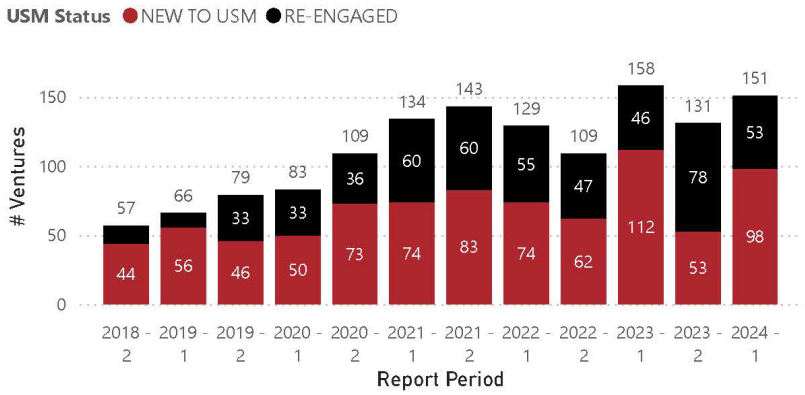
University System of Maryland

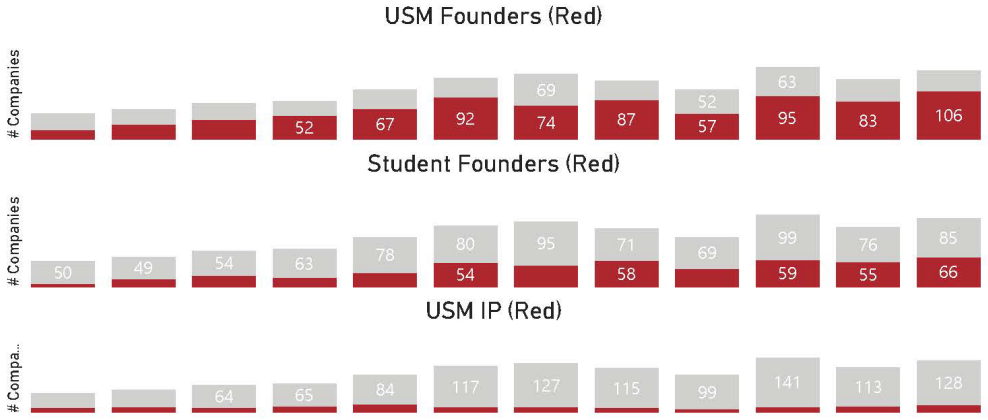
University System of Maryland

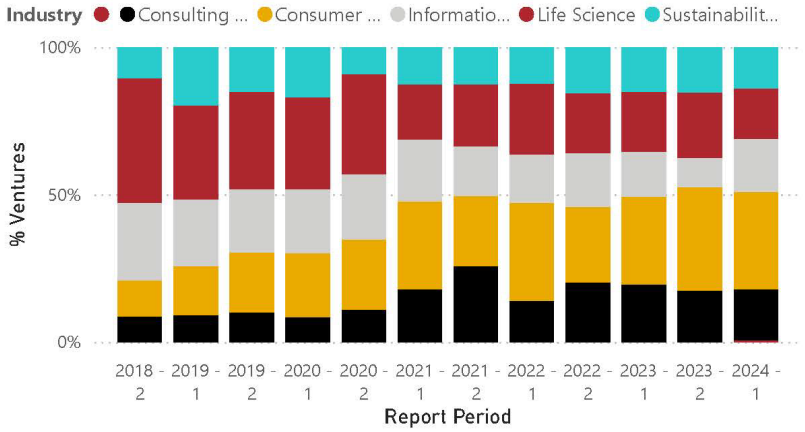
Ventures Supported

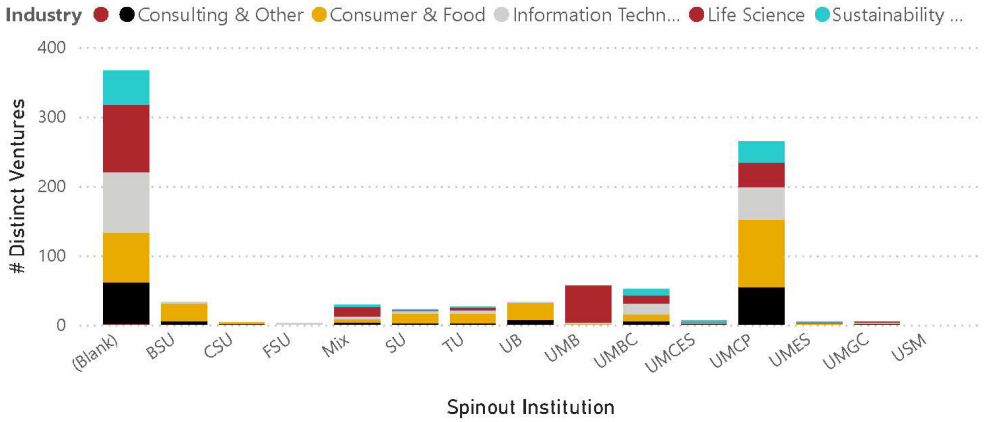
USM Status: All

Report Period: All









University System of Maryland

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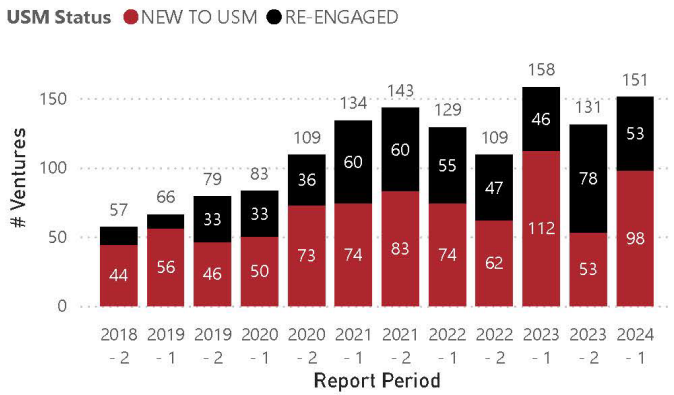
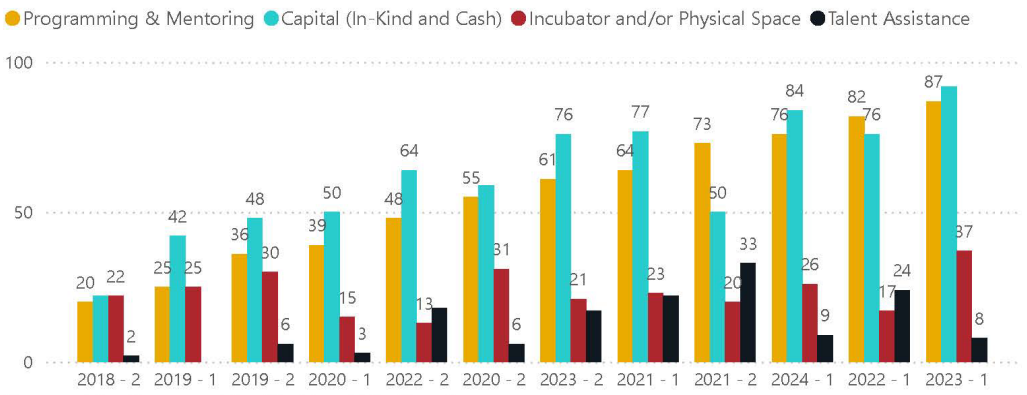
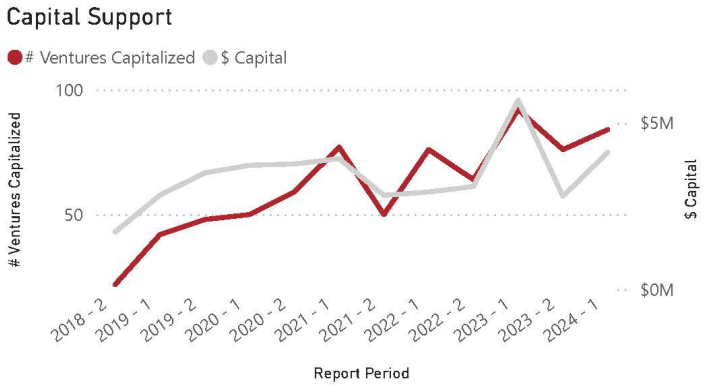
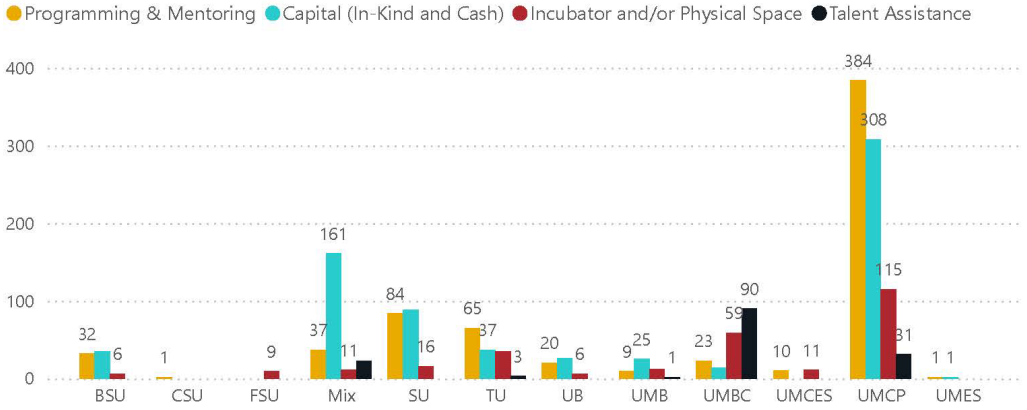
USM Status: All

Report Period: All









Additional State-Wide Venture Support

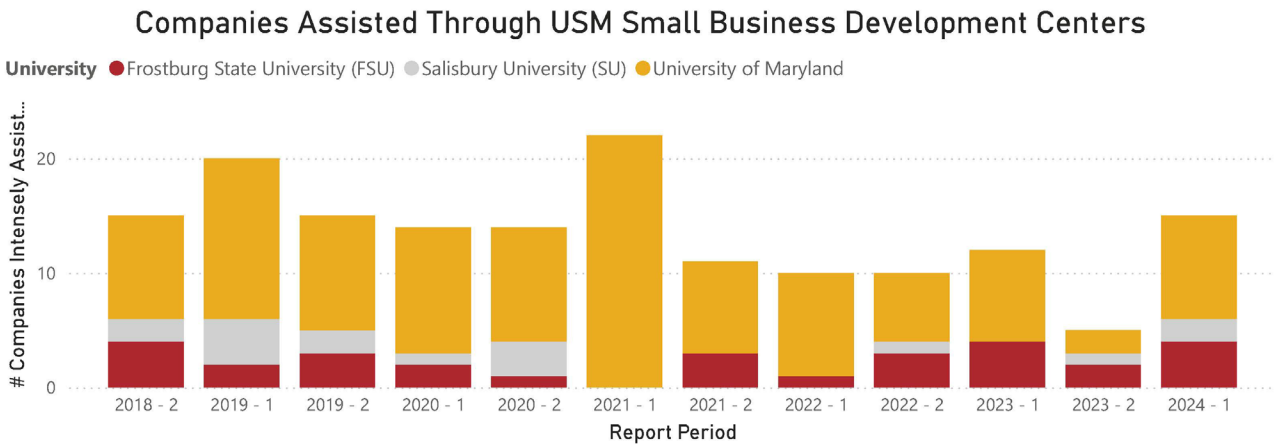
MARYLAND TECHNOLOGY INTERNSHIP PROGRAM

Helps Maryland retain top tech talent by increasing the number of paid technical internships offered in the state. Administered by UMBC and funded by the State of Maryland, the program offers financial assistance to technology-based businesses, as well as state and local agencies, to hire more interns (mtip.umbc.edu).

About 30% of startup participants also are USM "spinouts" or "spin-ins".

AMERICA'S SBDC MARYLAND

The Maryland Small Business Development Center (SBDC) is a public-private partnership between the U.S. Small Business Administration, the State of Maryland and UMCP. The Maryland network hosts entrepreneurial assistance programs at a number of USM institutions.



University of Maryland Baltimore – UM Ventures

Commercialization Activities

December 2024

University of Maryland Baltimore

UM VENTURES, BALTIMORE | ACTIVITIES

Intellectual Property

IP Group
*125 disclosures/yr**
~2300 active patents

Marketing/Licensing

Licensing Group
*40 licenses/yr**
*8 startups/yr**

Startups

New Ventures Group
- *Entrepreneurial guidance*
- *Specialized consulting*
- *Internal startup mgmt.*
  - **NVI program**

Investments

Technologies – LSIPF
42 technology investments

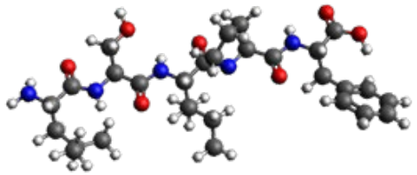
Startups – Equity Investments
19 investments in 12 companies, with 4 exits

*(Averaging over 5 yrs)

+ COMMERCIAL ADVISORS

Accelerating the commercialization of our intellectual property and technologies

LIFE SCIENCES IP FUND



UM Ventures, Baltimore
Center for Maryland Advanced Ventures

isoprene

living PHARMA

SurgiGYN

Breethe

Protaryx

HARPOON MEDICAL

MEDCURA

NeoProgen

SONOSA Medical Inc

NEXTSTEP ROBOTICS

GLIKNIK
TRULY NOVEL THERAPIES

COAPTECH

LIFE SCIENCES IP FUND (LSIPF)

- Pre-company R&D
- Launched 2018
- >$33 million in catalyzed capital
- Generate 3rd party data via CROs and the UM Ventures Convergent Bio Laboratory

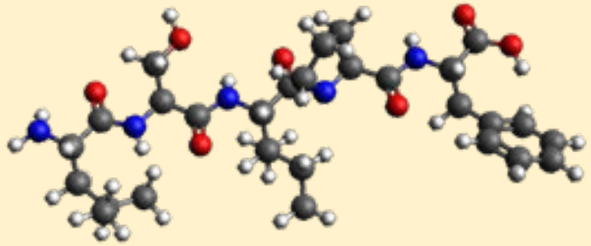
NEW VENTURES INITIATIVE (NVI)

- Launch and manage UMB IP based companies
- Initiated 2015
- 3 startups
- 2 exits

UMVB EQUITY INVESTMENTS

- Make direct investments in UMB IP based startups
- Initiated 2014
- >$100 million in catalyzed capital
- 6 approved products

LIFE SCIENCES IP FUND



UM Ventures, Baltimore
Center for Maryland Advanced Ventures

LSIPF Investment Process and Criteria

Intellectual Property

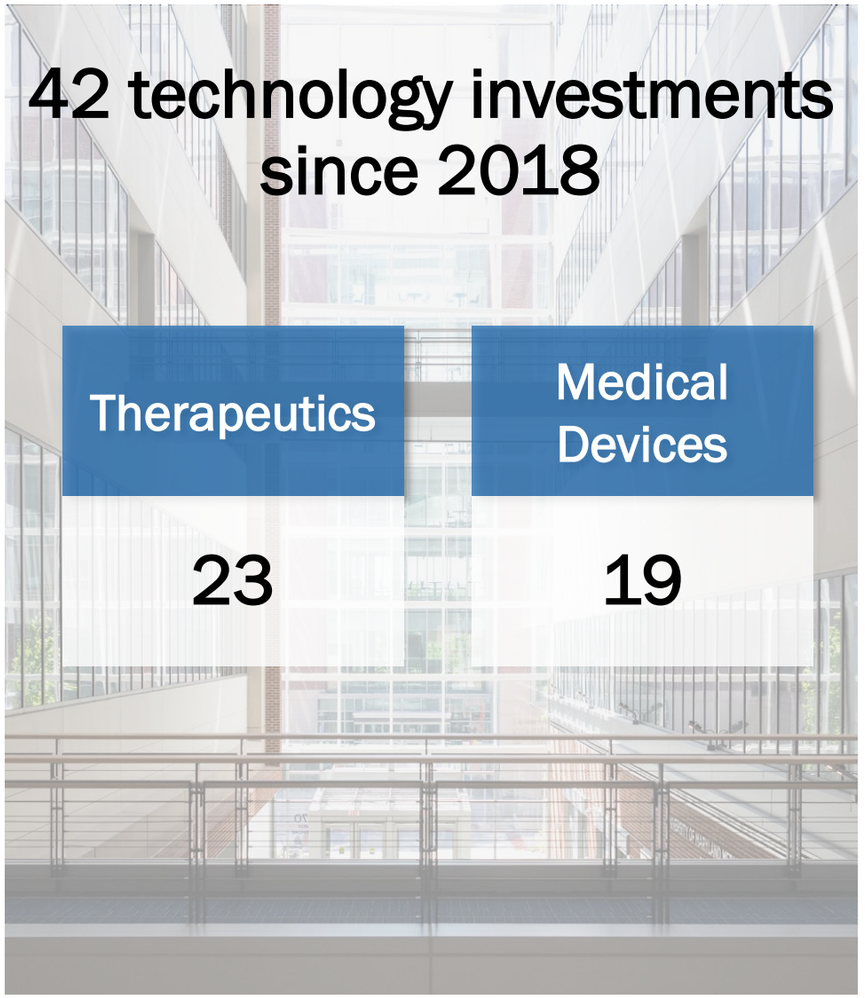
- Disclosed technology
- Assigned to UMB OTT

Review Committee

- Internal/external committee members
- Review the science, unmet medical need, impact, commercial readiness and the potential market opportunity
- Potential and likelihood of 3rd party co-funding and licensing
- Project Development
- Need/impact on meaningful advancement of the technology

Funding

- Generate 3rd party data
- Funding is milestone gated

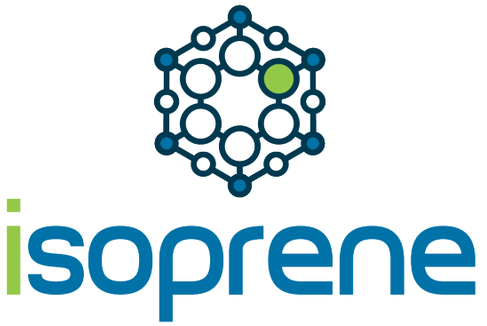


Select Life Sciences IP Fund Startups

Small Molecule Anti-inflammatory

Founded 2018

- Raised >$20 million in venture funding
- Completed Phase I Clinical Study
- Ongoing Phase II Clinical Study



Small Molecule Cancer Therapeutic

Founded 2018

- $2 million Phase II SBIR

Medical Device for Left-heart Transseptal Access

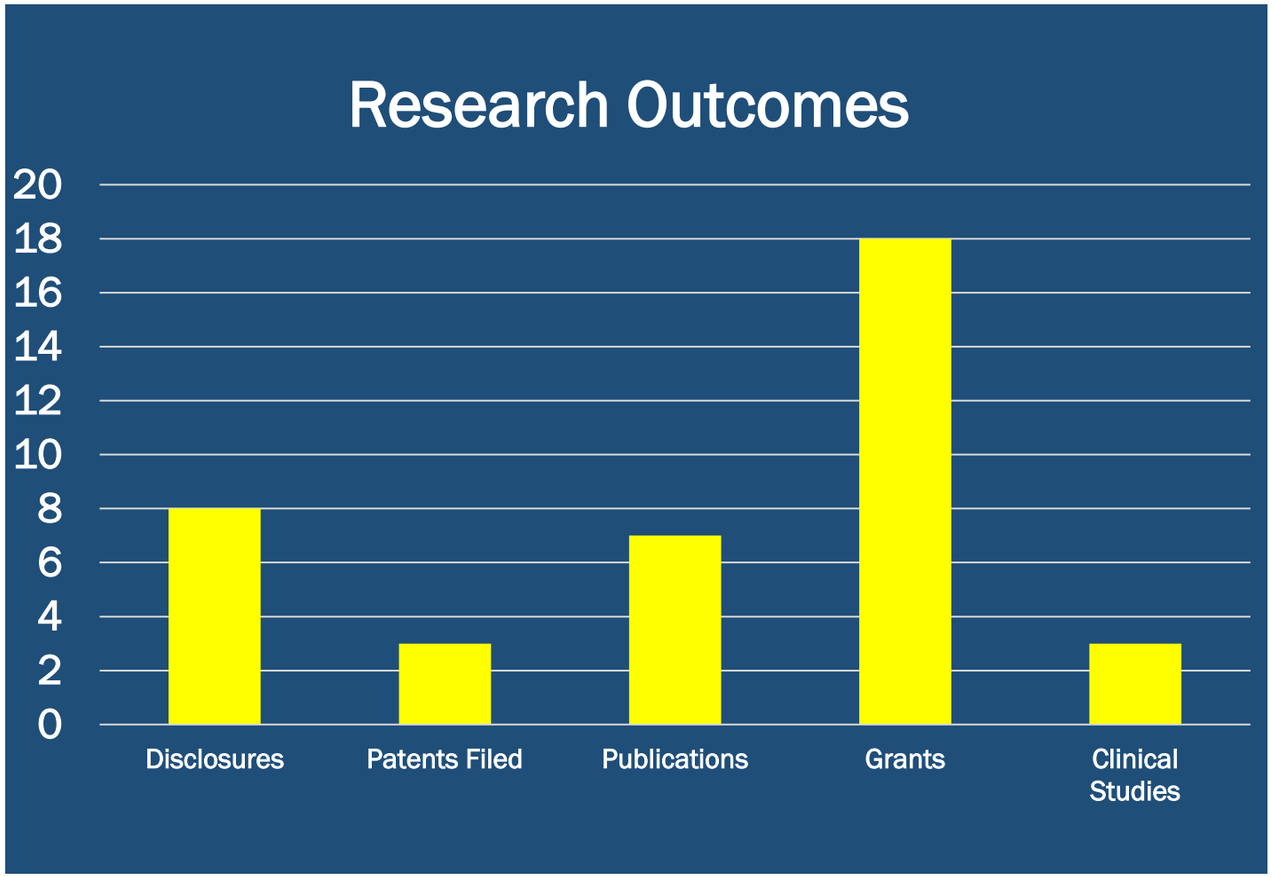
Founded 2019

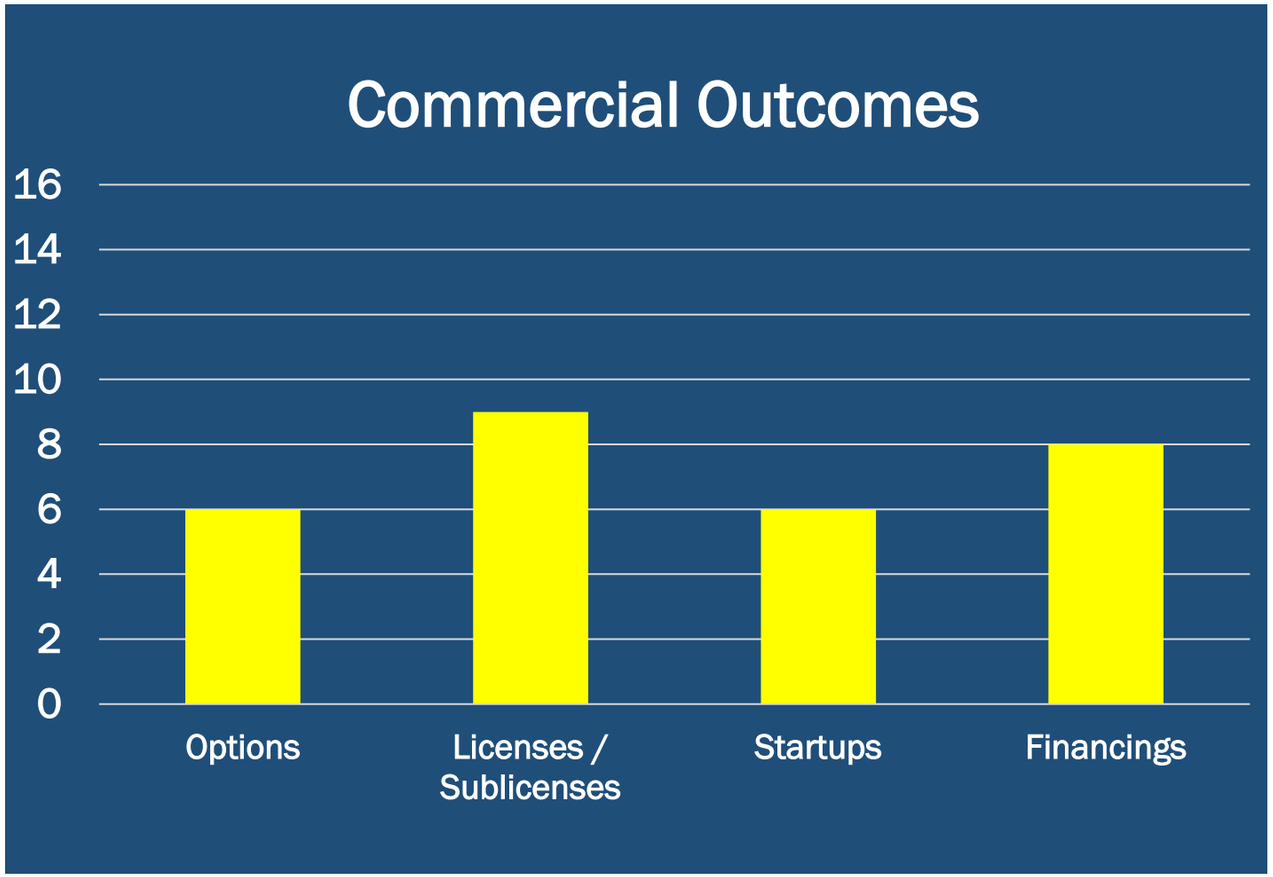
- $8.3 million Series A

68

19:1 Ratio
Catalyzed Capital

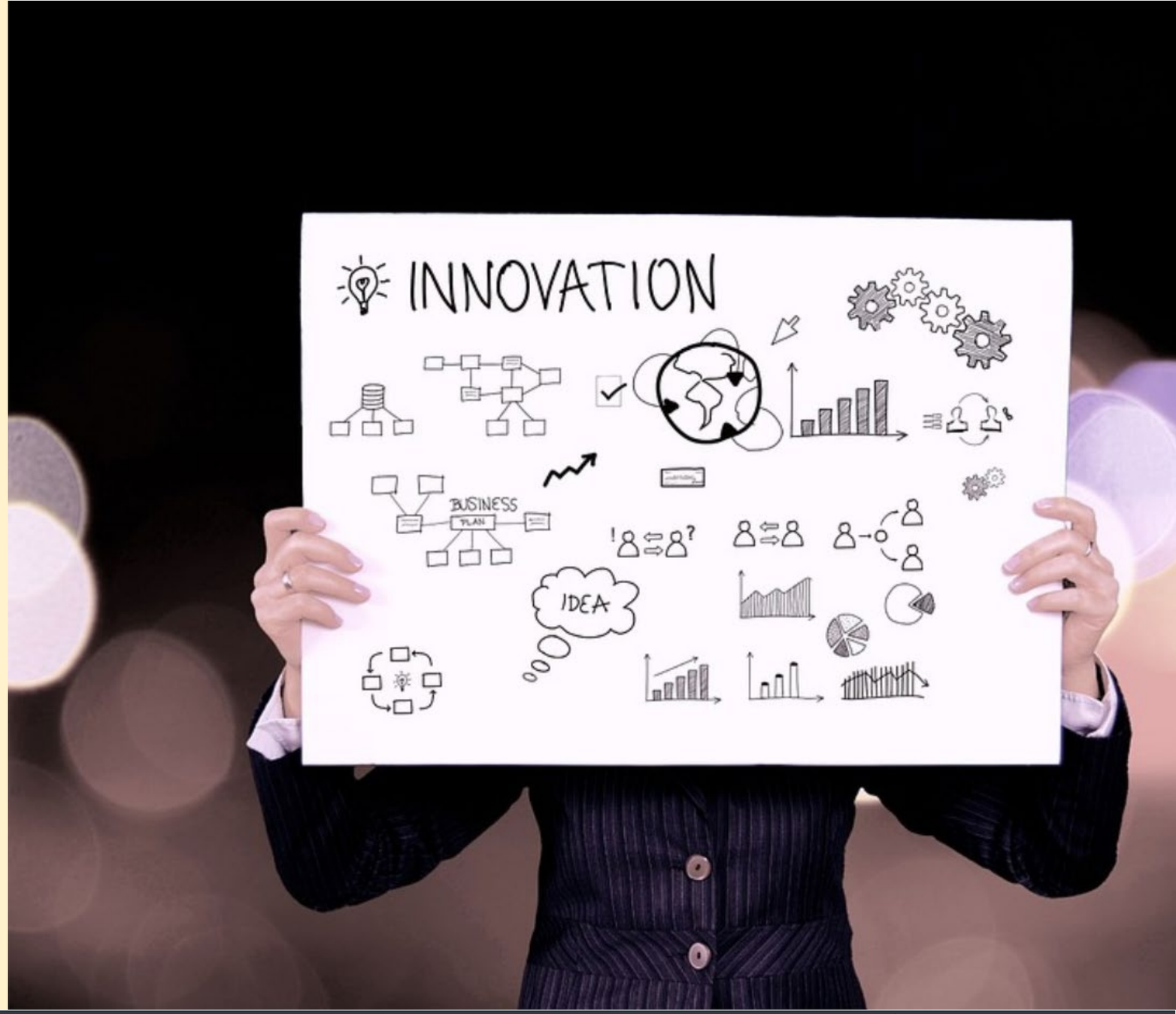
First project funded February 2018





New Ventures Initiative (NVI)

New Ventures Startups



New Ventures Startups

Universal CAR T Cell Therapy

Founded 2015

Minimally Invasive Surgical Device

Founded 2016

Small Molecule Cancer Therapeutic

Founded 2018

acquired by

Lentigen Technology Inc. a Miltenyi Biotec Company

Living Pharma, Inc., a University of Maryland, Baltimore New Ventures startup launched December 2015, develops personalized CAR T Cell therapy.

July 20, 2017

received strategic investment from

Strategic Partner

SurgiGyn, Inc., a University of Maryland, Baltimore New Ventures startup launched August 2016, develops minimally invasive surgical devices for gynecological surgery.

January 24, 2018 and July 9, 2018

acquired by

Strategic Partner

SurgiGyn, Inc., a University of Maryland, Baltimore New Ventures startup launched August 2016, develops minimally invasive surgical devices for gynecological surgery.

February 13, 2020

received strategic investment from

HOTHTHERAPEUTICS

Isoprene Pharmaceuticals, Inc., a University of Maryland, Baltimore New Ventures startup launched June 2018, develops small molecules for oncology and dermatology applications .

July 31, 2020

entered into an exclusive license agreement

HOTHTHERAPEUTICS

Isoprene Pharmaceuticals, Inc., a University of Maryland, Baltimore New Ventures startup launched June 2018, develops small molecules for oncology and dermatology applications .

July 31, 2020

Awarded $2,000,000 Phase II SBIR

National Cancer Institute

September 7, 2021

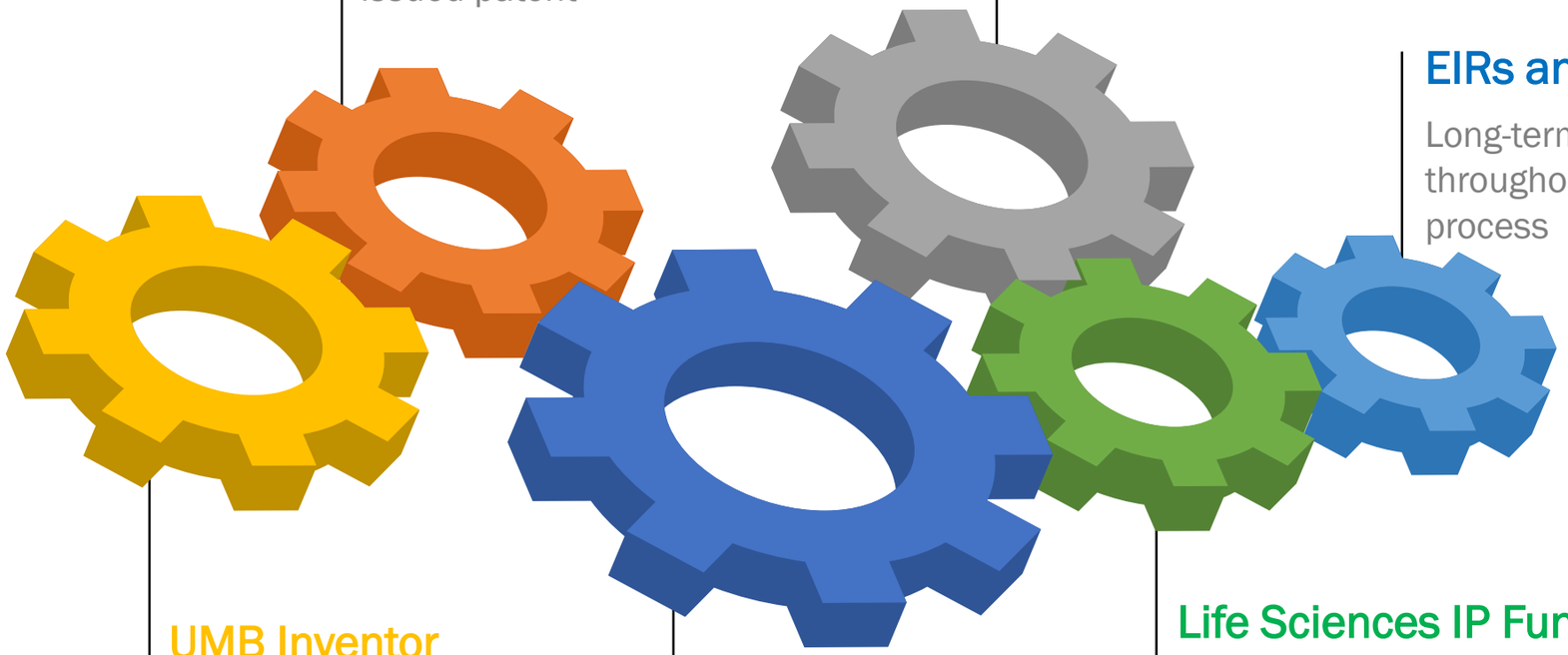
UMVB Equity Investments

UM Ventures Portfolio

Company Investments

From Inception Throughout Development

"Invest in what you know..."
Warren Buffet



Intellectual Property Team

6.5 years from disclosure to issued patent

New Ventures Team

8 years from disclosure to NVI company formation

EIRs and Venture Advisors

Long-term involvement throughout the development process

UMB Inventor

Preeminent subject matter expert

Licensing Team

5 years from disclosure to license

Life Sciences IP Fund

Data extension with 3rd party data

Investment Portfolio

HARPOON MEDICAL

- Nov. 2014 – First Investment
- Exit – Edwards Dec. 2017

Breethe

- Apr. 2015 – Seed Round
- Exit – Abiomed Apr. 2020

living PHARMA

- Jun. 2015 – NVI Seed
- Exit – Miltenyi Jul. 2017

MEDCURA

- Dec. 2016 – Seed Round
- Co-owned tech w/ UMCP

SurgiGYN

- Sept. 2017 – NVI Seed
- Exit – Med Device Feb. 2020

NEXTSTEP ROBOTICS

- Dec. 2018 – Seed/Bridge
- Momentum Fund Company

COAPTECH

- Jan. 2018 – Initial (Seed)
- Aug. 2020 – Series B
- Sept. 2024 – Series B2

NeoProgen

- Apr. 2019 – Seed Round
- Momentum Fund Company

Protaryx

- Jan. 2020 – Seed Round
- Jun. 2020 – Series A (Ajax Health)

isoprene

- Jan. 2021 – NVI Seed
- Aug. 2021 – Phase II SBIR

GLIKNIK
TRULY NOVEL THERAPIES

- Jul. 2021 – Series C
- Jun. 2023 – Series C-1

SONOSA Medical Inc

- Oct. 2023 – Pre-seed Round

Investment Portfolio

19 investments totaling $1.8 million

*Excludes UMVB investments and capital received by shareholders from acquisitions

Investment Portfolio Exits

an NVI company was acquired by Lentigen, a Miltenyi Biotec Company	acquired by Edwards Lifesciences	an NVI company was acquired by Strategic Partner	acquired by ABIOMED
$100,000,000 cash and $150,000,000 milestones			
July 20, 2017	December 6, 2017	February 13, 2020	April 29, 2020

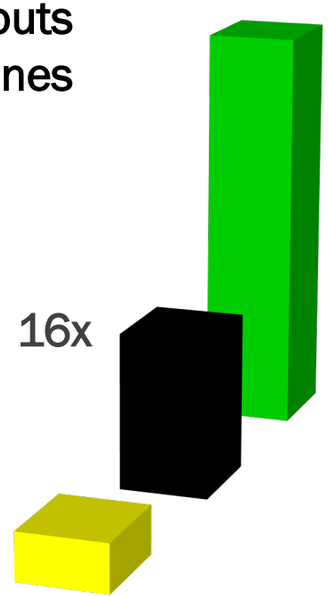
$20 billion average market capitalization of acquiror at time of acquisition

UMVB Return

Direct investment + common shares from license + earnouts and milestones

Direct investment + common shares from license — 16x

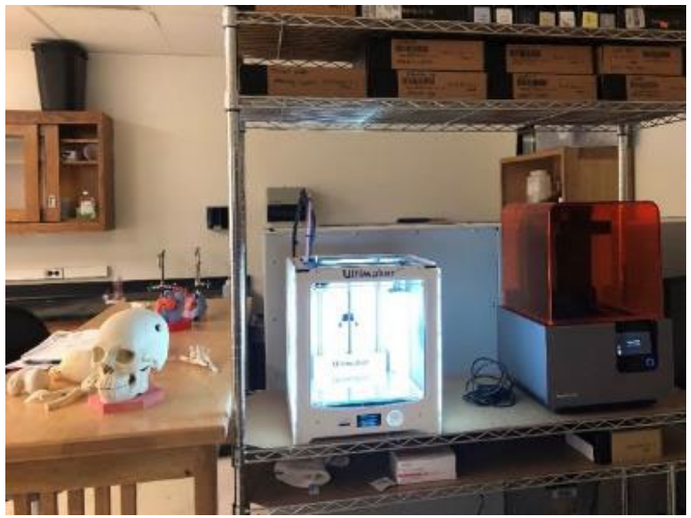
Preferred shares from direct investment (Direct Investment) — 5x



Resources for UMB Inventors & Startups

UM Ventures' Wet Lab

- Molecular & cell biology capabilities
- **Opened 2019** (UM BioPark)
- TRP expansion for UMB inventors (& Biorepository storage available)
- Designed for UMB startups (currently in high demand)
- Staffed by 1 FTE MD and PhD researchers



UM Ventures' Prototyping Lab

- Design, 3-D printing & tooling capabilities
- **Opened 2021** (Bressler Rm. 4034)
- Linked with UMD Fischell Biomedical Device Institute
- Staffed by full-time Medical Device Research Engineer

4MLK

- Gateway between the BioPark, UMB, and UMMC
- **Opening** *(MLK Jr Blvd & Baltimore St.)*
- Class A laboratory, office, co-working and convening spaces

NEW R&D FUNDING OPPORTUNITIES – BLACKBIRD LABS & UM-BILD

Blackbird Laboratories Launches With $100 Million Grant from Stephen and Renee Bisciotti Foundation

Nov 07, 2023 at 04:36 PM

Clifton Brown
BaltimoreRavens.com Staff Writer

University of Maryland, Baltimore Receives Landmark Funding to Create New Innovation Hub in West Baltimore and the Region

November 21, 2023 | Deborah Kotz

UM School of Medicine Faculty Leading the Way in Attracting Life Sciences Start-Up Companies, Building a Diverse Workforce

University of Maryland, Baltimore (UMB) President Bruce Jarrell, MD, FACS, and University of Maryland School of Medicine (UMSOM) Dean Mark Gladwin, MD, announced today that the university has received a four-year, $4 million Research Evaluation and Commercialization Hubs (REACH) grant from the National Institutes of Health (NIH). The grant, shared with the University of Maryland Baltimore County (UMBC), will support both institutions' work advancing the biomedical entrepreneurship and innovation economy in West Baltimore and Greater Baltimore. It will also serve to train one of the most diverse biomedical and entrepreneurial workforces in the country.

"We recognize that to create our own unique cohort of newly trained

Life Sciences IP Fund

- 42 technology investments with $5 million committed
- 6 startups
- 19:1 catalyzed capital to LSIPF investment
- 3 clinical studies (2 first in human clinical studies)

NVI Startups

- 3 NVI startups
- 2 exits (Living Pharma and SurgiGyn)
- 2 strategic investments
- $2 million Phase 2 SBIR (Isoprene Pharmaceuticals)

UMVB Resources

- Convergent Bio wet laboratory
- Medical device prototyping laboratory
- Business management

UMVB Investments

- 19 investments in 12 companies
- 16x return (plus upside) on 4 investment exits including equity from UMB IP license agreements
- >$100 million in catalyzed capital
- 6 product approvals

UNIVERSITY of MARYLAND BALTIMORE

Contact Us

Phil Robilotto, DO, MBA
Associate Vice President
Office of Research & Development
Director, UM Ventures, Baltimore

(410) 706-2378

probilotto@umaryland.edu

https://www.umventures.org/

Purpose: Advance biomedical entrepreneurship and innovation economy in West Baltimore and Greater Baltimore

Funding: Supported by a $4 million Research Evaluation and Commercialization Hubs (REACH) grant from the National Institutes of Health

Upcoming Launch Dates: Applications for the next round of Financing will open in February 2025 for the September 2025 funding cycle

Programming Metrics		
Cohort #1 – Sept, 2024		
	6 UMB Technologies	$450,000
Cohort #2 – April 2025		
	5 UMB Technologies	$375,000

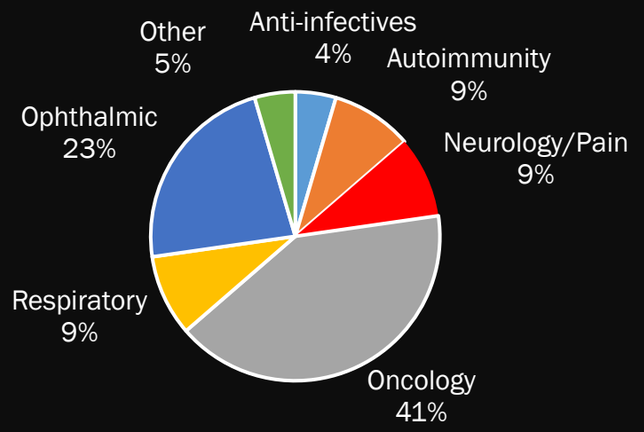
Life Sciences IP Fund - Select Therapeutic Projects

Project ID	Technology	Project	Status
CMAV-2022-002	Chimeric Antigen Receptor targeting CD229	• IND enabling membrane proteome array • Clinical study: Multiple myeloma	• Partnered
CMAV-2024-001	Non-opioid drug for neuropathic pain	• Development of an oral, extended-release formulation • Clinical study: Neuropathic pain	
CMAV-2024-002	Monoclonal antibodies for the management of obesity	• PoC studies testing antibodies to a novel target in obesity	
CMAV-2024-005	Targeting a novel cancer antigen expressed on the cell surface	• Target antigen surface expression analysis • Antibody characterization	
CMAV-2025-001	Anti-obesity small molecule	• PoC studies testing a small molecule in a diet induced obesity model	

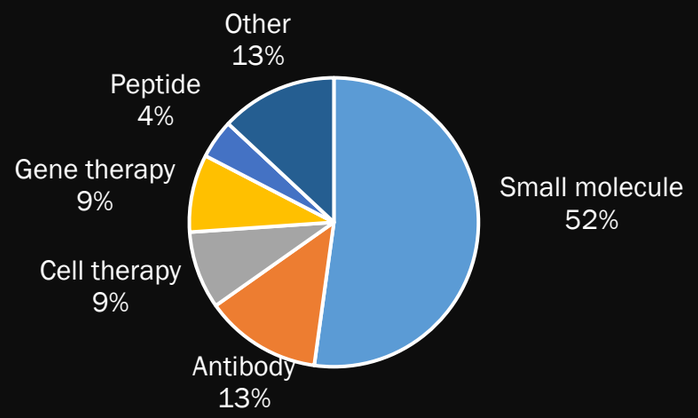
Life Sciences IP Fund - Therapeutics

- 23 therapeutics projects
- $1.35 million funded
- Over $4 million committed to projects

Disease Area



Modality



CONVERGENT BIO

UM Ventures, Baltimore - Innovation Laboratory

- 650ft^2 launched in 2019
- Molecular & cell biology capabilities
- Staffed by 1 FTE MD and PhD researchers

KaloCyte

- Investment from Maryland Momentum Fund and Old Line Capital
- $46.4 million Consortium DARPA Award

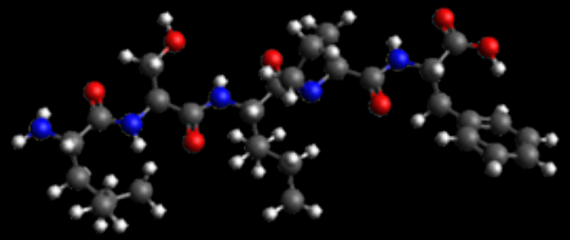
isoprene

- $2 million Phase II SBIR

COURIER THERAPEUTICS
www.couriertherapeutics.com

- Acquired by Valo Health, LLC a Flagship Pioneering company

LIFE SCIENCES IP FUND



UM Ventures, Baltimore
Center for Maryland Advanced Ventures

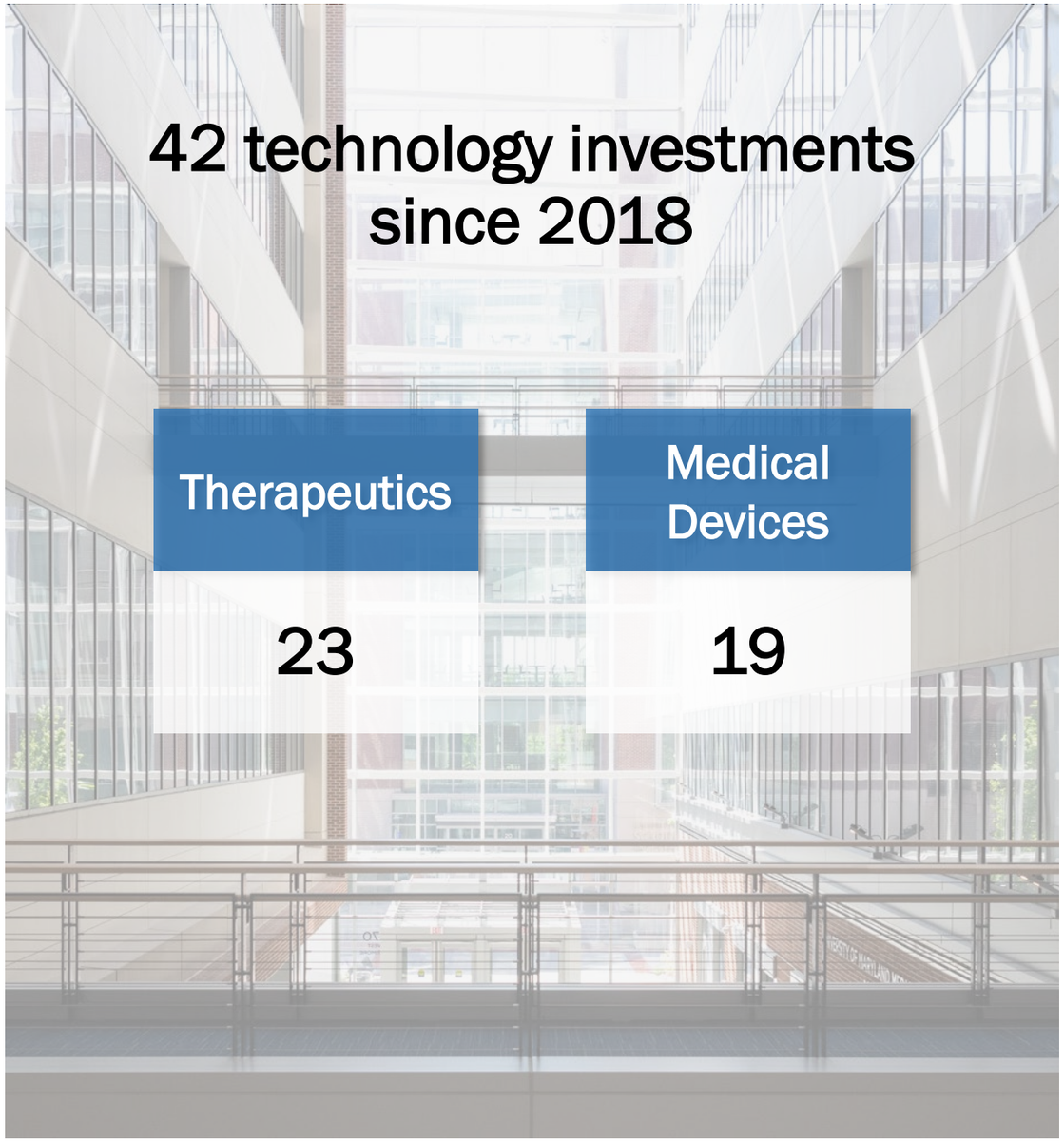
Accelerate development without burdening the researcher's laboratory operations

Generate 3rd party data and extend findings

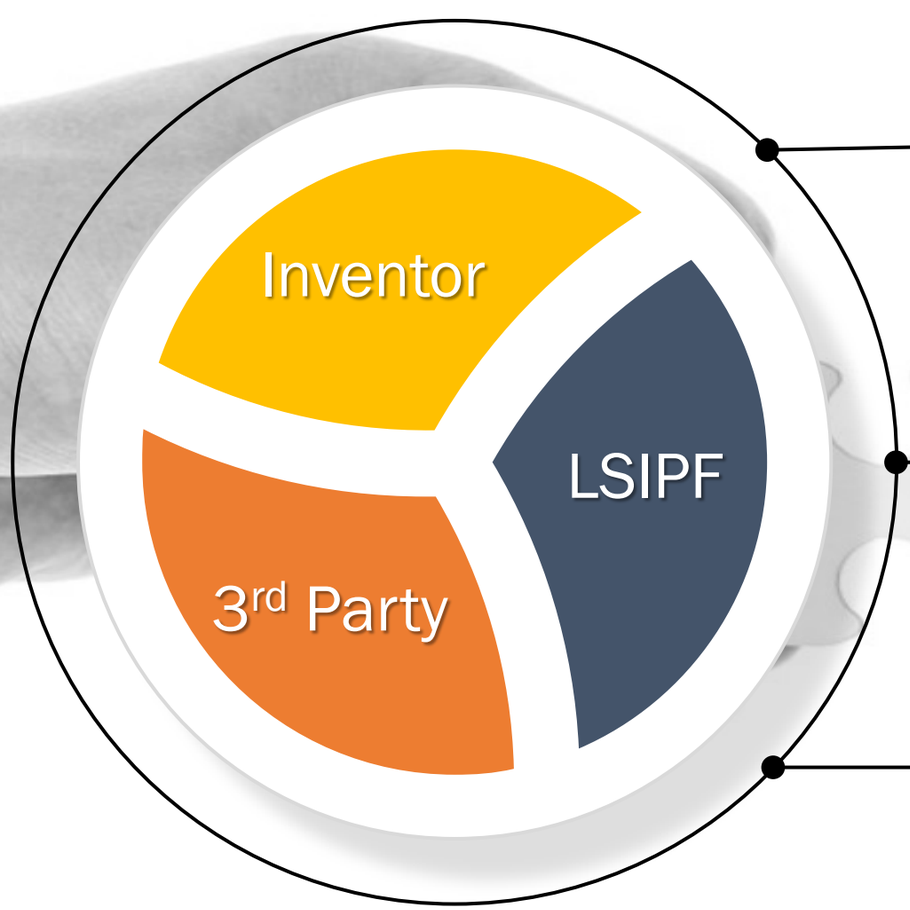
Milestone gated investments

The University of Maryland Strategic Partnership Act of 2016 created the Center for Maryland Advanced Ventures (CMAV)

CMAV has launched several initiatives, including the Life Sciences IP Fund (LSIPF) in December 2017



3rd Party Partnership Model



Technical expertise and support for novel biology with pre-licensed intellectual property

Sourcing, project development, co-funding and active project management

Co-funding, technology specific clinical and/or product development expertise

University System of Maryland

MARYLAND MOMENTUM FUND

Maryland Momentum Fund

Board of Regents
Q1 2025 Fund Update

Presented By:
Mike Ravenscroft
Managing Director

Fund investment activity: 2024

3 USM Institutions

12X ratio leveraged capital

4 investments in 2024	$590K invested	50% technology transfer
$6.17M fund balance	$10.76M invested by MMF to date	28 active portfolio companies, 4 successful exits

Company Acquisition:

PAVER GUIDE
ADVANCING PERMEABLE

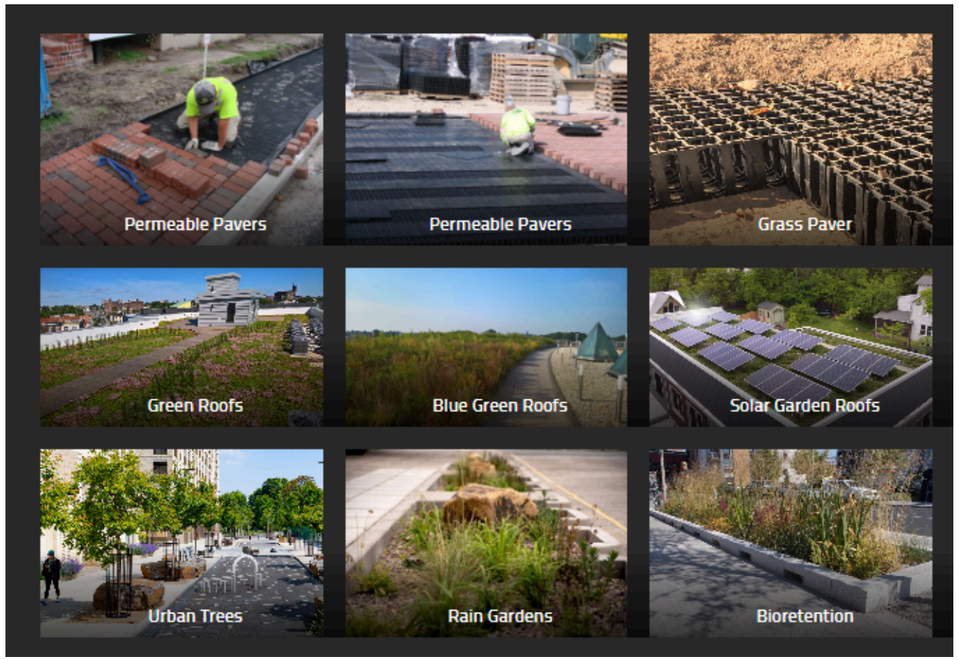
Invested in 2019

TOWSON UNIVERSITY
UNIVERSITY OF MARYLAND

Co-investment with University of Maryland, College Park

Raised from MMF, Chesapeake Bay SCF, local angel investors

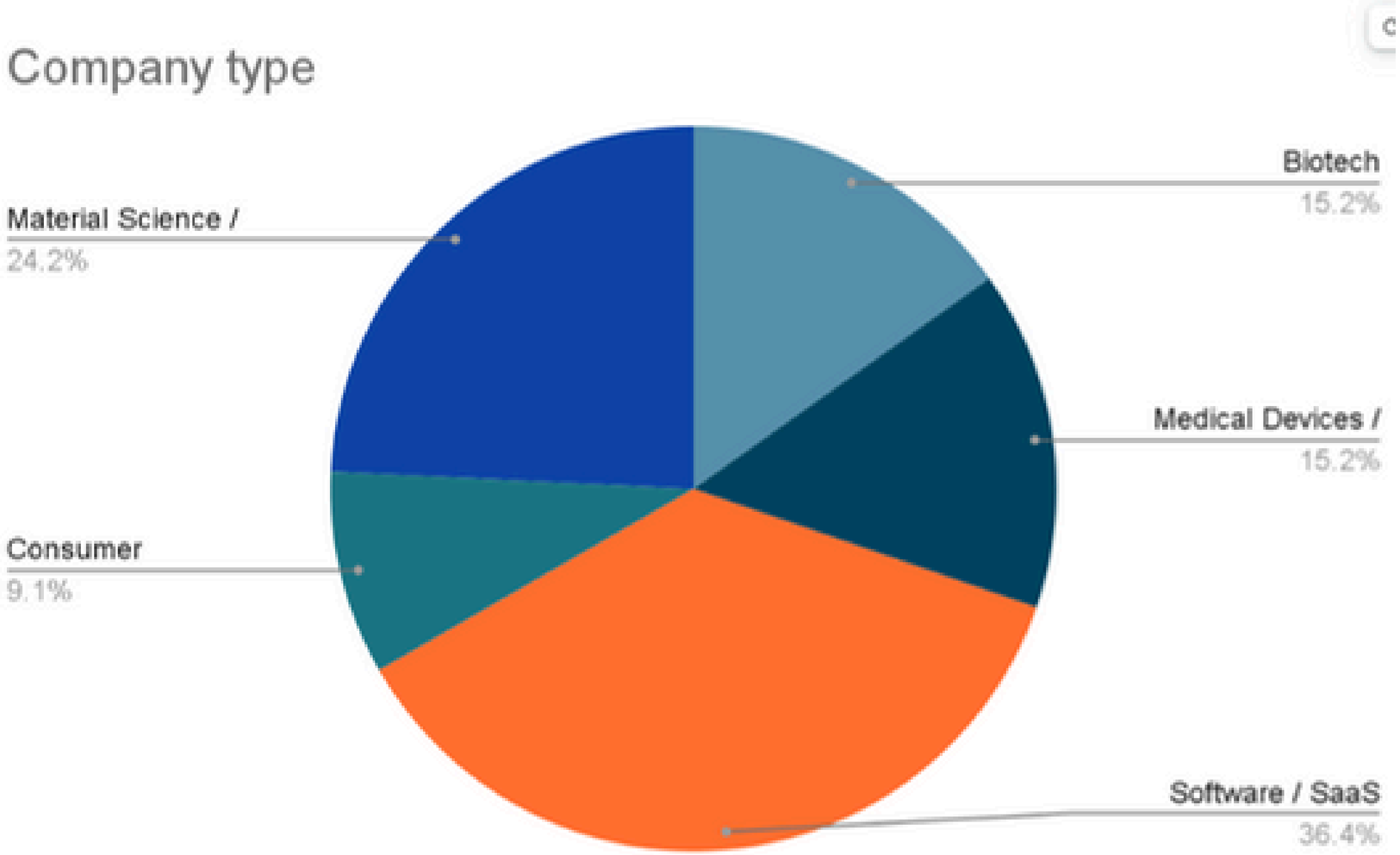
Acquired by a major North American stormwater solutions provider



Support from the Momentum Fund and the Chesapeake Bay Seed Capital Fund helped the company launch, grow, and exit.

Portfolio snapshot: January 2025

- 28 active
- Employ approximately 260 people on a full or part-time basis
- 50% BIPOC founders
- 25% female founders



Our North Star:

Equip USM students with the skills, connections, and professional experience they need to build careers in venture capital.

VENTURE FELLOWS PROGRAM: WHY WE LAUNCHED

THE PROBLEM

There are few opportunities for USM students to gain exposure to venture capital. As a result, the industry remains insular and difficult to access.

THE SOLUTION

Create a robust regional talent pipeline using the Maryland Momentum Fund's network of VCs and our access to the USM talent pool.

VALUE

Secure venture internships and career pathing for USM students, make a name for USM as a talent pipeline for venture roles, and deepen MMF's ties to the national venture community.

ABOUT THE USM VENTURE FELLOWS PROGRAM

OUR MISSION:

Empower students of all backgrounds to enter and explore the venture capital and early-stage finance industries confidently and fearlessly.

GOAL

Provide USM students an on-ramp to enter the venture ecosystem and serve as a critical venture talent pipeline in the Mid-Atlantic and beyond.

PROGRAMS

The Venture Fellows Program consists of three phases: Applications and matching, educating & training, and mentorship through their summer Internship.

How we’re tracking in Year 2:

150+ applicants from 5 USM institutions

37 participating venture funds

90+ interviews

16 internship offers

12 offers accepted = 12 venture fellows

UNIVERSITY of MARYLAND BALTIMORE

TEDCO
LEADING INNOVATION TO MARKET

UNIVERSITY SYSTEM of MARYLAND

Who are our students?

20 fellows and counting

Across **5 USM** institutions (and counting)

Diversity of backgrounds and degree areas

All of them aspiring to roles in the **Maryland venture ecosystem**

Looking nationally:

Mostly **internal** facing

Primarily **academic** in nature

Don’t emphasize integration with **local venture** ecosystem

How we differentiate:

UNIVERSITY SYSTEM of MARYLAND

MARYLAND MOMENTUM FUND

- Internship as the starting point
- Direct career advancement
- Combination of academic, practical, and network development
- Designed to integrate students with local venture ecosystem
- Creating value for our ecosystem partners

UMBC

Research & Creative Achievement

USM Board of Regents
Committee on Research & Economic Development

79/112 January 31, 2025

UMBC
DIVISION OF RESEARCH & CREATIVE ACHIEVEMENT

Division of Research & Creative Achievement

ORCA is comprised of seven offices that work closely together to address needs and requirements related to extramural support and relationships for building and managing our institutional research portfolio.

Office of Research Development (ORD)
Don Engel

Office of Sponsored Programs (OSP)
Michael Walsh

Office of Technology Development (OTD)
Wendy Martin

ORCA Leadership





Karl V. Steiner | Dean Drake | Don Engel | Donna Ruginski | Christine Mallinson

Office of Research Administrative Systems (ORAS)
Chanell Rome

Office of Research Protections & Compliance (ORPC)
Andrew Glenn

Earth & Space Research Administration (ESRA)
Margo Young

Office of Center Administration & Management (OCAM)
Michal Mielech

Excellence in Research & Creative Achievement

Environmental Resilience and Space Sciences
- Atmospheric Physics & Remote Sensing
- Earth & Space Science & Technology
- Ecology & Remediation

Data Sciences, AI, and National Security
- Cybersecurity
- Artificial Intelligence and Autonomy
- Quantum Science and Big Data Analytics

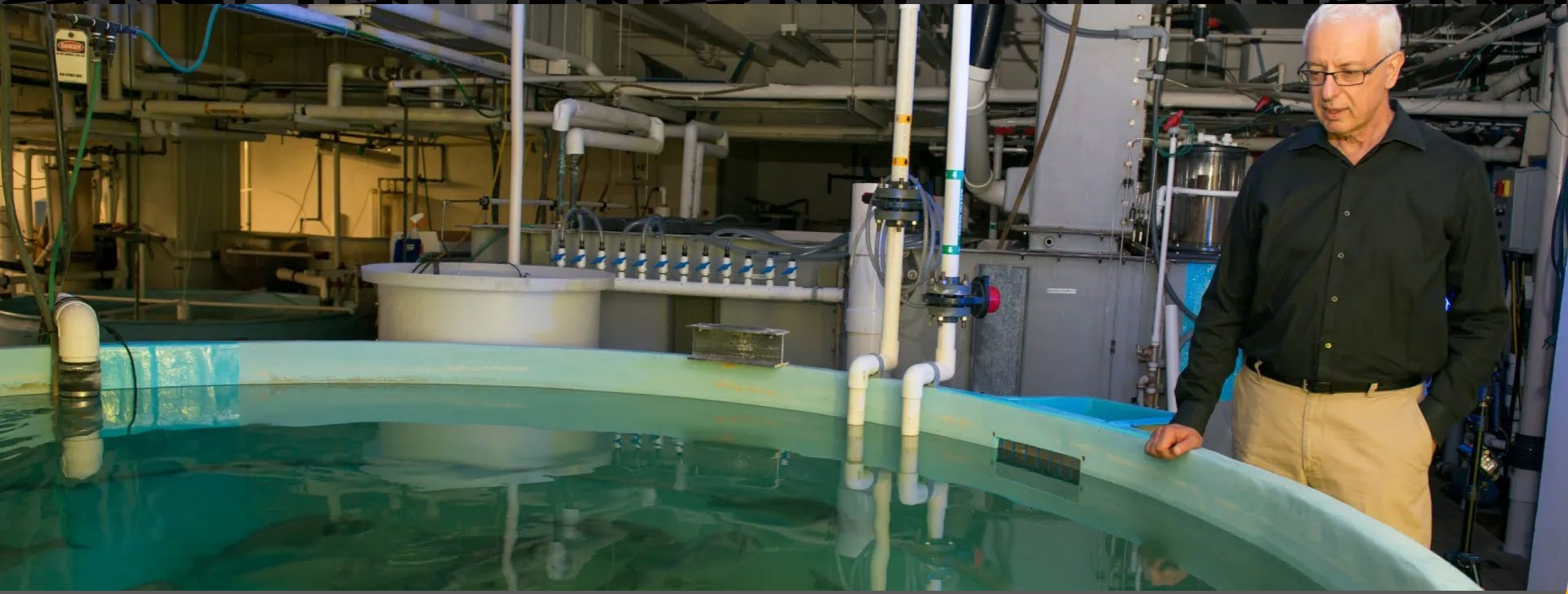
Health and Life Sciences
- Bio-Sciences & Bio-Engineering
- Marine Biotechnology & Aquaculture
- State Health Policy

Community, Equity, and Social Justice
- Health Equity
- Public Policy

History, Identity, and Society
- Archival Research
- Culture & History

Creative Engagement
- Intercultural Communication
- Public Humanities & Arts

Environmental Resilience & Space Sciences



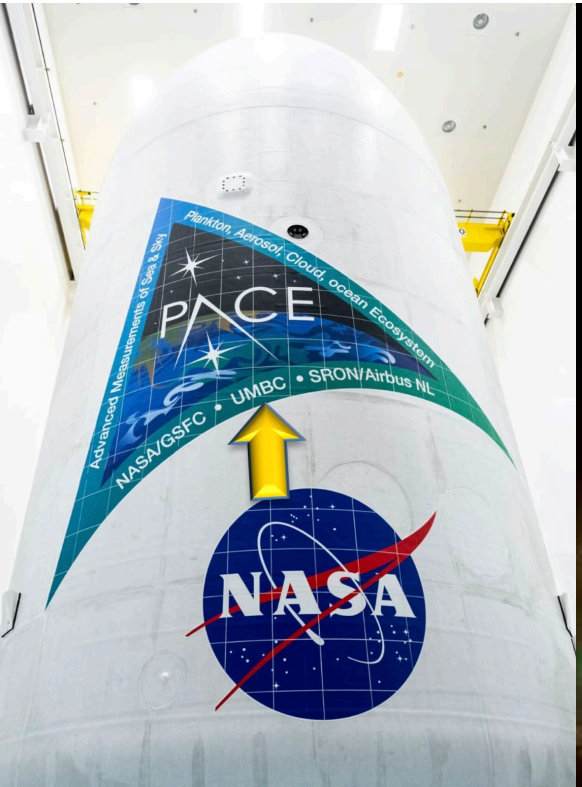
Yonathan Zohar, Marine Biotechnology, utilizes $10M Award from USDA-NIFA to further Aquaculture Research for Atlantic Salmon under SAS^2 Initiative

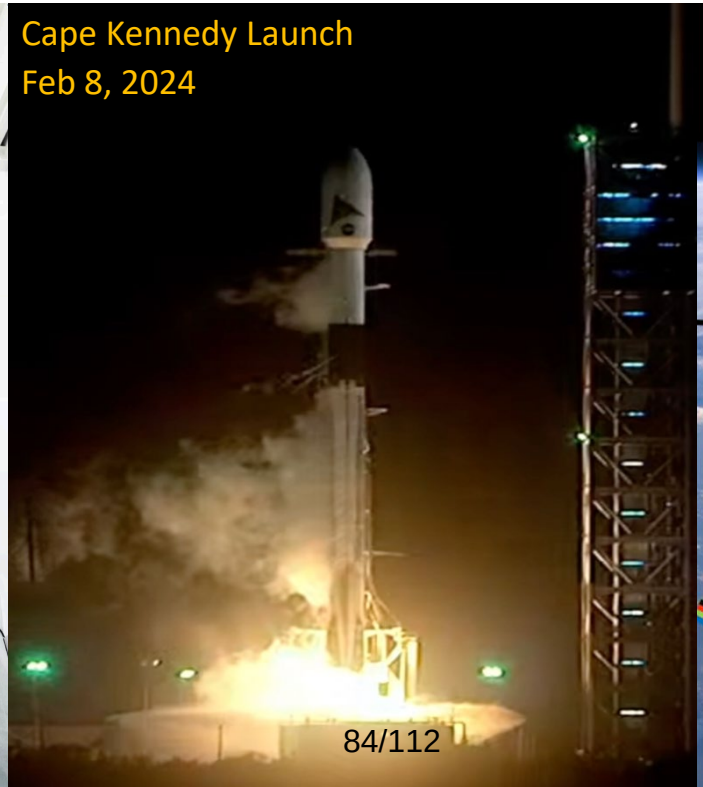
HARP2 launched with NASA PACE Mission

PACE Launch at Cape Kennedy
Feb 8, 2024

HARP2 launched with NASA PACE Mission

UMBC's HARP2 Polarimeter is part of PACE mission to study the *Plankton, Aerosol, Cloud, ocean Ecosystem*
PACE was launched Feb 8, 2024; HARP2 is collecting global data on aerosols and clouds.
First Light Announcement: April 11, 2024





UMBC is going to Moon

UMBC Team led by Mehdi Benna in CSST, selected by NASA to develop lunar instrument for ARTEMIS III Moon landing mission.

Lunar Instruments for Artemis III Moon Mission

NASA has announced the first science instruments designed for astronauts to deploy on the surface of the Moon during Artemis III. Once installed near the lunar South Pole, the three instruments will collect valuable scientific data about the lunar environment, the lunar interior, and how to sustain a long-duration human presence on the Moon.

Lunar Environment Monitoring Station (LEMS)
LEMS is a compact, autonomous seismometer suite designed to carry out continuous, long-term monitoring of the seismic environment, namely ground motion from moonquakes, in the lunar south polar region.

- **LEMS development is led by Mehdi Benna**
- **CSST Senior Planetary Scientist at UMBC**

Other projects awarded for the Artemis III Moon mission:

- Lunar Effects on Agricultural Flora (LEAF)
  - Led by Space Lab Technologies in Boulder, CO
- Lunar Dielectric Analyzer (LDA)
  - Led by the University of Tokyo, Japan

UMBC–NASA Goddard Partnership

Three Decades of Cooperative Partnerships between NASA Goddard Space Flight Center (GSFC) and UMBC

- Over 250 Faculty, Scientists, and Researchers

GESTAR II – Goddard Earth Sciences Technology & Research Center

- *Established in 2021, extended in 2024*
- *Director:* ***Charles Ichoku****, GES*

ESI – Earth & Space Institute

- *Established in 2017*
- *Director:* ***Vanderlei Martins****, Physics*

GPHI – Goddard Planetary Heliophysics Institute

- *Established in 2011, renewed in 2021*
- *Director:* ***Jan Merka****, GPHI*

CSST – Center for Space Sciences and Technology

- *Established in 2006, extended in 2021*
- *Director:* ***Don Engel****, CSEE*

UMBC is #10 in NASA Funding

NSF – HDR Institute Award

Institute for Harnessing Data and Model Revolution in the Polar Regions

- One of five NSF-funded *Harnessing the Data Revolution (HDR)* Institutes
- iHARP focuses on massive data in space and time and integrate data with numerical and physical models to better understand the response of polar regions to climate change and its global impacts by deeply integrating data science and polar science to spur physics-informed, data-driven discoveries.

Lead Institution – UMBC

- Institutional Partners: Dartmouth, U Colorado Boulder, Amherst, U Minnesota, U Texas Austin, U Alaska Fairbanks, U North Texas
- Five-year, $13.7M Award

iHARP Director: **Vandana Janeja**

- Professor, Information Systems
- Associate Dean for Research & Faculty Development, COEIT
- http://iharp.umbc.edu

Nuclear Fusion Reactor

The project supports the design and constructions of a device to produce nuclear fusion energy, where energy is released when two nuclei collide at high speeds.

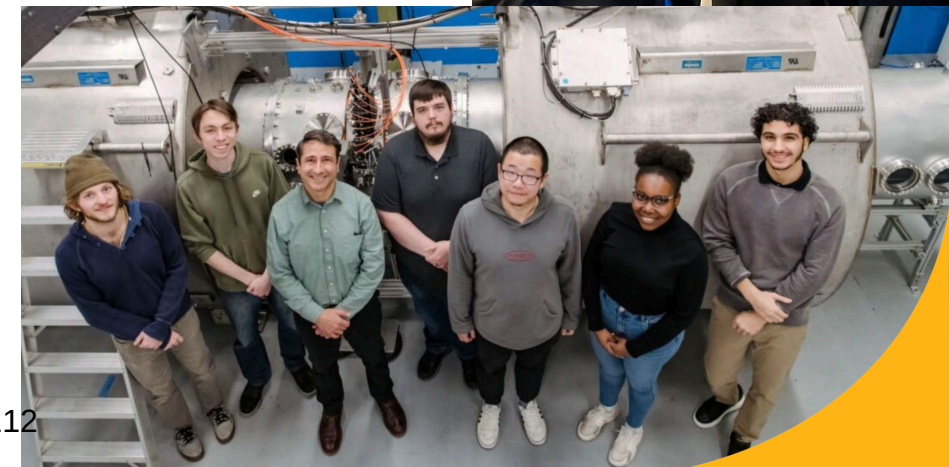
The device consists of hundreds of large, high-voltage capacitors and electromagnets and will include active controls to prevent the magnets from overheating.

Collaboration with the Energy Research Facility at UMD-College Park

Supported by DOE ARPA-E
– $4M Award

PI: **Carlos Romero-Talamás**
– Associate Professor, Mechanical Engineering


ARPA-E Director
Evelyn Wang



DOE Frontiers in Energy Research Center

The **Quantum Photonics Integrated Design Center (QuPIDC),** which is led by Purdue University and includes Los Alamos National Laboratory, Stanford University, Northwestern University, the University of Chicago, the University of Oklahoma, Virginia Tech, and UMBC.

The collaboration is one of 10 new **Frontiers in Energy Research Centers** recently funded by the U.S. Department of Energy. The centers support top-tier interdisciplinary teams as they pursue transformative basic research that will advance energy technologies.

Supported by DOE

- $13.9M Total Award
- $570k to UMBC

UMBC Lead: **Matt Pelton**

- Professor and Chair, Physics

Environmental Resilience – Research & Education

Environmental and Natural Resource Economics and Policy
Yusuke Kuwayama – Public Policy

Environmental Economics
Maria Bernedo Del Carpio – Economics

Environmental Ethics
Blake Francis – Philosophy

Environmental Justice
Dawn Biehler – Geography and Environmental Systems

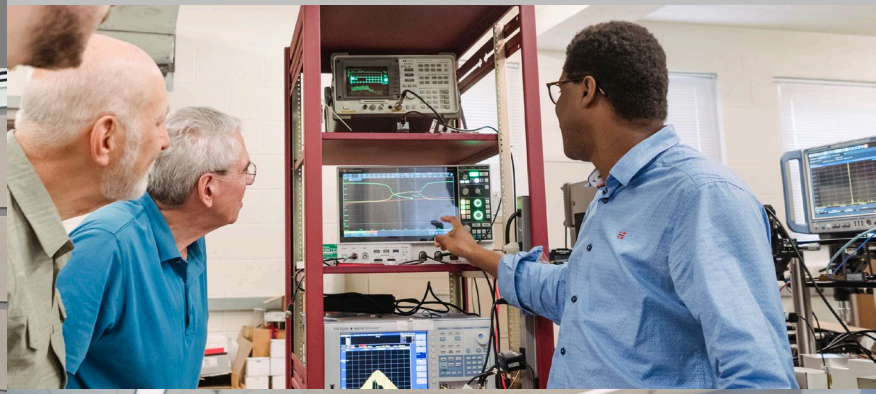
Data Sciences, AI, and National Security

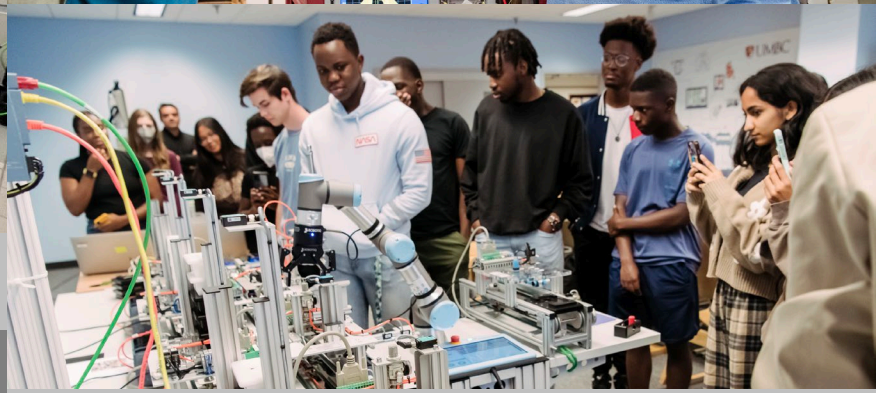
Richard Forno and Alan Sherman, CSEE, secure $4.9 M in NSF support for UMBC's CyberCorps – Scholarship for Service program

Major Centers with U.S. Army

Center for Real-time Distributed Sensing & Autonomy (CARDS)
Aryya Gangopadhyay – IS, Director; launched 2021

Center for Navigation, Timing & Frequency Research (Centavr)
Curtis Menyuk – CSEE, Director; launched 2022





Center for Research in Emergent Manufacturing (CREM)
Nilanjan Banerjee – CSEE, Director; launched 2023

Cyber Range for IT/OT Systems

Cyber-Range for
Workforce Training &
Secure Manufacturing
Operational Technology

- former Catonsville District Courthouse
- 900 Walker Avenue

UMBC Cybersecurity Institute

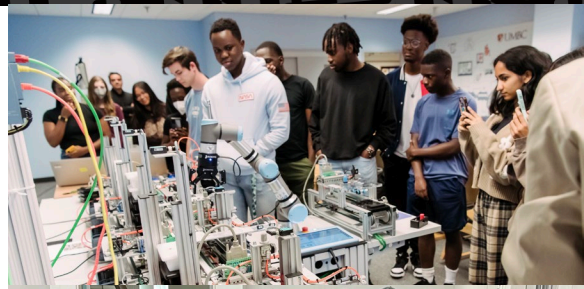
The UMBC Cybersecurity Institute (UCI) provides unified interdisciplinary academic and research leadership, partnership, innovation, and public outreach in this critical discipline

- UCI comprises some 40 faculty from multiple disciplines
- Secured $3M base funding support from State of Maryland in 2022

- Initial round of three new faculty hires completed in Spring 2024
  - Fabio Anzà, Physics
  - Chul Hyun Park, Public Policy
  - Keke Chen, Computer Science & Electrical Engineering

- Six Searches underway in CSEE, IS, Math, Political Science, Economics

https://cybersecurity.umbc.edu



Center for Artificial Intelligence

CAI supports and promotes UMBC communities conducting research, application, and education in all areas of AI.

- Over 60 faculty with a broad set of expertise from all UMBC Colleges
- CAI faculty work in 30 laboratories and Centers/Institutes
- Tracks/Certificates under development.

History: 40 years of AI research since Sanjeev Ahuja completed his dissertation on abductive reasoning in the mid-1980s

Research areas: machine learning, human language understanding, robotics, computer vision, knowledge graphs, LLMs, generative AI, multi-agent systems, IoT, …

Applications: human-computer teams, robotics, healthcare, cybersecurity, privacy, climate/wildfire modeling, manufacturing, mechanical & chemical engineering, pedagogy/education, …

CAI Director: **Tim Finin**

- Hackerman Chair in Engineering
- Professor, Computer Science & Electrical Engineering
- *https://ai.umbc.edu* *ai-center@umbc.edu*

Quantum Science Institute

UMBC's Quantum Science Institute (QSI) formally launched in January 2025

- QSI builds upon the collective expertise of some 24 founding faculty members in Physics, Computer Science & Electrical Engineering, Information Systems, and Mathematics.

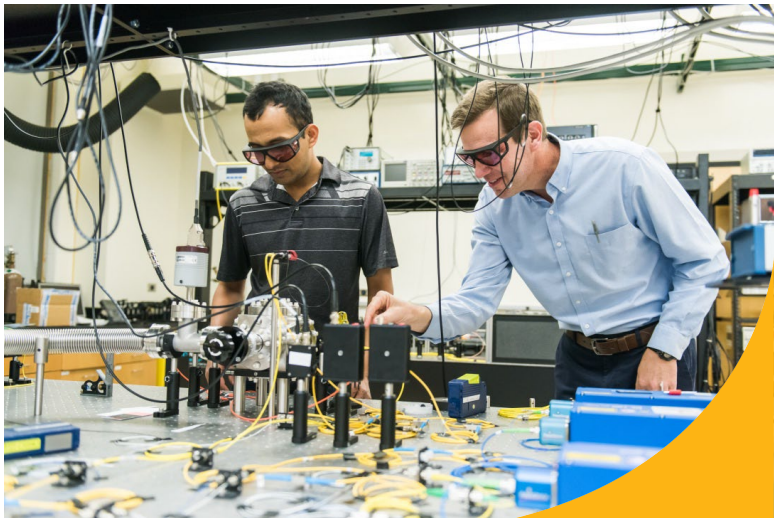
- It catalyzes a new Baltimore-based quantum research effort, in direct support of Governor Moore's *'Capital of Quantum'* Initiative to position Maryland as a global leader in quantum information science and technology.

Congressional Support secured through NIST in FY24

- $1.5 Million

QSI Director: **Todd Pittman**

- Professor, Physics
- *https://qsi.umbc.edu*



Health and Life Sciences

UMBC's Interdisciplinary Life Sciences Building – 130,000 sqft – Fall 2019

The Hilltop Institute

Founded in 1994, the Hilltop Institute is a non-partisan health research organization, with expertise in Medicaid and in improving publicly financed health care systems, dedicated to advancing the health and wellbeing of people and communities.

- Leading provider of health informatics for MD state agencies
- Significant strides in modernizing IT infrastructure
- Expanding footprint in research & engaged scholarship
- 58 Hilltop staff members
- FY 2024 Budget – $16M

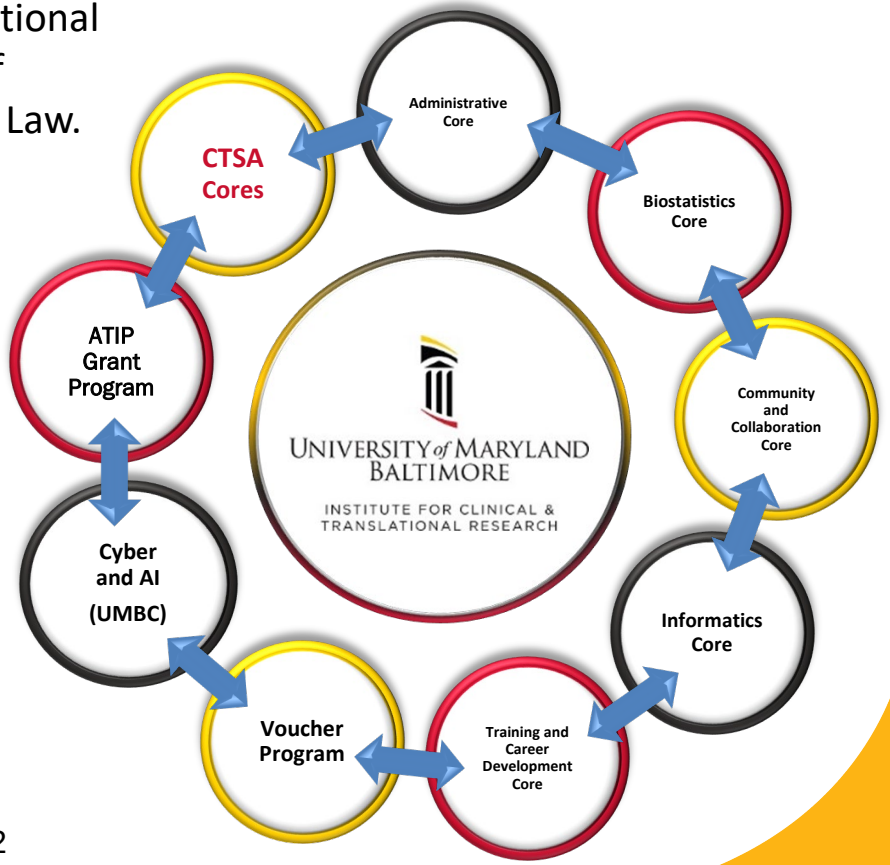
The Hilltop Institute
analysis to advance the health of vulnerable populations

Hilltop Interim Executive Director

- **Alice Middleton**
- *http://hilltop.umbc.edu/*

The Institute for Clinical & Translational Research (ICTR)

A University-wide, interdisciplinary hub for clinical translational research and training, bringing together UMB's Schools of Medicine, Pharmacy, Nursing, Dentistry, Social Work, and Law.



UMBC joined ICTR in 2019

- became a formal Collaborator during 2024 NIH Renewal
- Accelerated Translational Incubator Pilots (ATIP)
- Community Engaged Research (CEnR) Pilot Grants
- 22 of 90 total ATIP Grants to date include UMBC Faculty
- UMBC invested $500k to support these ATIP awards

NIH Maryland FIRST Award

Faculty Institutional Recruitment for Sustainable Transformation (FIRST)

UMBC and UMB-SOM received a five-year, $13.7 million grant from the National Institutes of Health (NIH) to enhance recruitment and training of junior faculty from groups underrepresented in biomedical science.

Funding is through the NIH Common Fund Faculty Institutional Recruitment for Sustainable Transformation (FIRST) program, founded in 2021 to support efforts to hire groups of diverse, early-career research faculty.

The grant support the hiring of four faculty at UMBC and six at UMB-SOM, each of whom will have cross-campus appointments at both institutions.

UMBC's Maryland FIRST faculty

- Gretchen Alicea, Biology (SP'25)
- Carmen Munoz-Ballester, Biology
- Diana Elizondo, Biology (SP'25)
- Cheng-Yu Li, Biology

Maryland FIRST PIs

- **James Kaper**, UMB-SOM
- **William LaCourse**, UMBC

Baltimore Life Science Discovery Accelerator (UM-BILD)

With the support of a four-year $4M Research Evaluation and Commercialization Hubs (REACH) grant from NIH, the University of Maryland, Baltimore (UMB) and UMBC will advance the biomedical entrepreneurship and innovation economy in West Baltimore and Greater Baltimore and increase biomedical workforce and startup workforce diversity.

- UM-BILD provides seed investments of up to $75,000 and development resources to support the translation of basic science research projects into commercial products that will advance patient care.
- Application for UM-BILD Accelerator will open in Feb 2025 for the Sept 2025 funding cycle.

- https://www.umaryland.edu/um-bild/

2024/25 UMBC UM-BILD Recipients

- **Kathie Seley-Radtke**
  - Chemistry/Biochemistry
- **Ian Stockwell**
  - Information Systems

Society, Community, Equity, and Creative Engagement

Kimberly Moffitt, Dean, CAHSS, leads “Breaking the M.O.L.D.” initiative supported by $3M Award from Andrew W. Mellon Foundation

DIVISION OF RESEARCH & CREATIVE ACHIEVEMENT

Public Research for Public Good

Center for Innovation, Research & Creativity in the Arts

CIRCA, established in 2013, is an interdisciplinary arts center of the College of Arts, Humanities & Social Sciences. CIRCA's mission is to inspire and promote inquiry and experimentation across the arts.

CIRCA supports innovative project-based research in the Arts by faculty, students, and visiting scholars, and promotes the development of interdisciplinary and collaborative projects that advance the arts in an environment of emerging technologies.

CIRCA Director: **Lynn Cazabon**
- Professor, Visual Arts
- *http://circa.umbc.edu/*

CIRCA
Center for Innovation, Research, and Creativity in the Arts

Dresher Center for the Humanities

The James T. and Virginia M. Dresher Center for the Humanities was established in 1996 and promotes and supports research into the historical, cultural and social dimensions of the human experience, at UMBC, in the Baltimore-Washington region, and beyond.

The Dresher Center is a think tank that encourages intellectual exchange and cultivates interdisciplinary and collaborative scholarship. It fosters creative thinking about the role of the humanities in civic life and builds partnerships that engage communities in addressing issues of equity, inclusion, and justice through the tools of the humanities. It hosts the Inclusion Imperative Programs addressing diversity and inclusion in the humanities (funded by a major grant from the Mellon Foundation)

- Works-in-Progress Talks; Interdisciplinary Faculty Working Groups; Book Publication Workshops; Writing "Boot Camps" and New Faculty "Micro-Talk" Presentations
- External Grants Workshops and pre-award Assistance
- Scholarly Development and Completion Grants
- Research Fellowships for UMBC and visiting scholars

Dresher Center Director: **Amy Froide**
- Professor, History
- *http://dreshercenter.umbc.edu*

Center for Social Science Scholarship

The Center for Social Science Scholarship (CS3) was founded in 2018 with the broad ambition to support and strengthen social science research, teaching, and community and professional engagement and to enhance the future of innovative, collaborative, cross- and inter-disciplinary, and cutting-edge social science scholarship at UMBC.

- **Community**: Social science faculty, graduate and undergraduate students, alumni, and the public
- Research Highlights:
  - Social Sciences Forum distinguished lectures
  - Research workshops, trainings, and events
  - Cross-college collaborations including Data Science Scholars Program, Social Responsibility in Technology Education innovation project

THE CENTER FOR SOCIAL SCIENCE SCHOLARSHIP AT UMBC

CS3 Director: **Eric Stokan**
- Associate Professor, Political Science
- ***https://socialscience.umbc.edu***

Junior Faculty secure NSF CAREER Awards

Lujie Karen Chen, Information Systems – 2024
- *Teaching to Empower with Learning Analytics for College Students by College Students*

Mercedes Burns, Biological Sciences – 2023
- *Local adaptation to reproductive conflict in the distribution of facultatively parthenogenetic reproductions*

Tyler Josephson, Chemical, Biochemical & Environmental Engineering – 2023
- *Automated Reasoning to Advance Chemical Theory*

Deepak Koirala, Chemistry & Biochemistry – 2023
- *Structural and Mechanistic Studies of RNA Mediated Enteroviral Genome Replication*

Chenchen Liu, Computer Science & Electrical Engineering– 2023
- *Rethinking PIM-Assisted GPU Computing for Multi-Tenant Artificial Intelligence*

Deepa Madan, Mechanical Engineering – 2023
- *Interfacial Engineering and Additive Printing of Flexible Thermoelectric Materials*

Sanjay Purushotham, Information Systems – 2023
- *Trustworthy and Robust Federated Learning for Computational Healthcare*

Özgür Çapraz, Chemical, Biochemical & Environmental Engineering – 2022
- *Identifying and Controlling Interfacial and Structural Instabilities in Transition Metal Oxide Cathodes for Na-ion Batteries*

Cynthia Matuszek, Computer Science & Electrical Engineering – 2022
- *Robots, Speech, and Learning in Inclusive Human Spaces*

Lauren Clay, Emergency Health Services – 2021
- *Bolstering Food System Resilience to Reduce the Human Impacts of Disasters*

James Foulds, Information Systems – 2021
- *Fair Artificial Intelligence for Intelligent Humans: Removing the Barriers to Deployment of Fair AI Technologies*

UMBC Faculty have received 50 NSF CAREER Awards

UMBC

R1 DOCTORAL UNIVERSITY

02/02/2022

New Carnegie Research Classifications in 2025

Carnegie Research 1 Institutions

Very High Spending and Doctorate Production

- $50M in Expenditures (as reported to HERD in 2023)
- 70 Doctorates graduated (as reported to IPEDS in 2023)

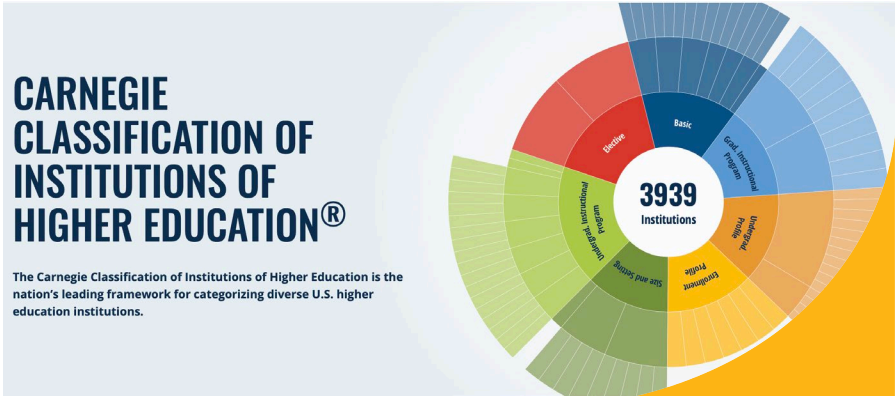
Carnegie Research 2 Institutions

High Spending and Doctorate Production

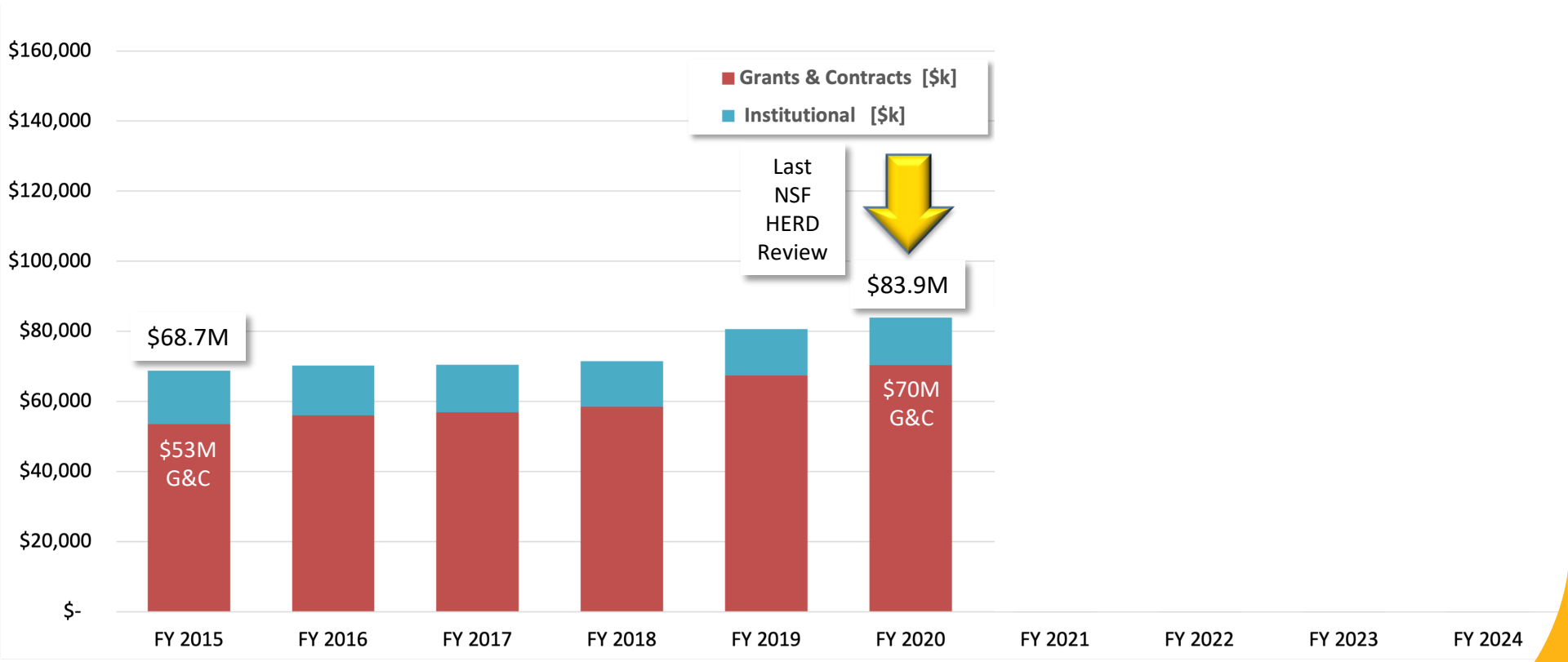
- $5M in Expenditures
- 20 Doctorates graduated

Research Colleges and Universities

- $2.5M in Expenditures



HERD R&D Expenditures History



UMBC reported 100 PhD Graduates to IPEDS in 2023

Carnegie 1 Status requires ≥ $50M in HERD and ≥ 70 PhDs in IPEDS

Division of Research & Creative Achievement

Rachel Brewster advances understanding of how organisms adapt to oxygen deprivation

Striving for more efficient and equitable healthcare: Ian Stockwell wins major NIH

UMBC

Research & Creative Achievement

Dr. Karl V Steiner

Vice President for Research & Creative Achievement

steinerk@umbc.edu

UMBC

DIVISION OF RESEARCH & CREATIVE ACHIEVEMENT