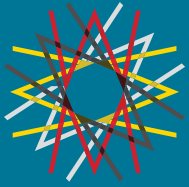




RESEARCH | ECONOMIC DEVELOPMENT | EDUCATION | SERVICE



UNIVERSITY OF MARYLAND STRATEGIC PARTNERSHIP MPOWERING THE STATE

COLLABORATION. INNOVATION. IMPACT.

The University of Maryland Strategic Partnership:

MPowering the State (MPower)

An innovative, structured collaboration that connects world-class strengths in research, technology, and education at the University of Maryland, Baltimore (UMB) and the University of Maryland, College Park (UMCP).



RESEARCH

Advancing Interdisciplinary and High-Impact Research

Page 3

ECONOMIC DEVELOPMENT

Growing Innovative Startups and Technologies

Page 7

EDUCATION

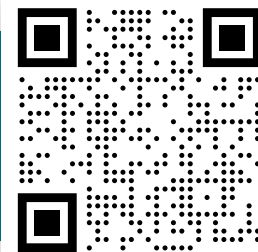
Accelerating the Education of the Next Generation of Marylanders

Page 10

SERVICE

Tackling the State's Critical Issues

Page 13



To learn more about our impact
and our future, please visit
mpower.maryland.edu

ADVANCING INTERDISCIPLINARY AND HIGH-IMPACT RESEARCH

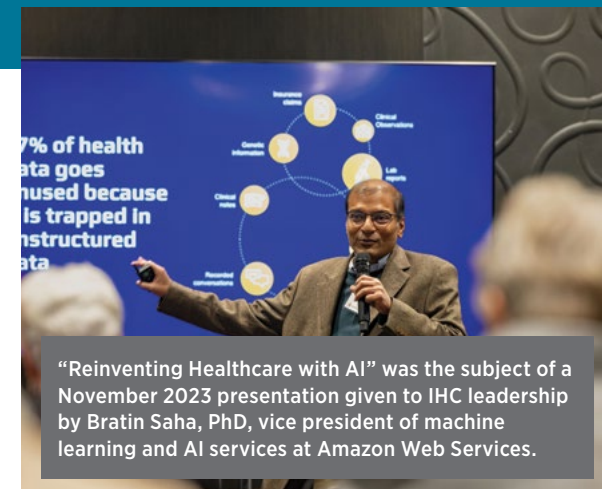
MPower uses collaboration as its most powerful tool to accelerate the pace of research impact.

Selected Research **Partnerships**

UNIVERSITY OF MARYLAND INSTITUTE FOR HEALTH COMPUTING (IHC)

Transformational *MPower* partnership connects top-tier computational expertise and biomedical research to build a learning health care system and improve patient care and outcomes in Maryland and beyond.

www.ihc.umd.edu



“Reinventing Healthcare with AI” was the subject of a November 2023 presentation given to IHC leadership by Bratin Saha, PhD, vice president of machine learning and AI services at Amazon Web Services.



Montgomery County Executive Marc Elrich speaks to IHC leadership in November 2023.



Gov. Wes Moore and Lt. Gov. Aruna Miller meet with local leaders in February 2023 to discuss the new research institute.
PHOTO CREDIT: EXECUTIVE OFFICE OF THE GOVERNOR



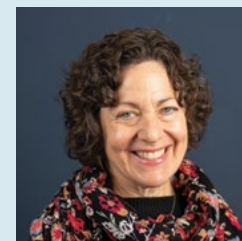
IHC researchers moved to office space in North Bethesda.
PHOTO CREDIT: JONES LANG LASALLE IP, INC.

MPOWER PROFESSORSHIP PROGRAM

Prestigious annual award recognizes, enables, and fosters strong faculty collaborations.

www.mpower.maryland.edu/initiatives/mpower-professorship

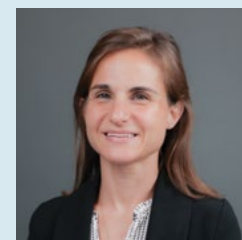
Cohort 3, Announced November 2023



Lisa Berlin, PhD, MS
University of Maryland
School of Social Work, UMB



Wolfgang Losert, PhD
College of Computer,
Mathematical, and Natural
Sciences, UMCP



Jessica Magidson, PhD
College of Behavioral and
Social Sciences, UMCP



James Polli, PhD
University of Maryland School
of Pharmacy, UMB

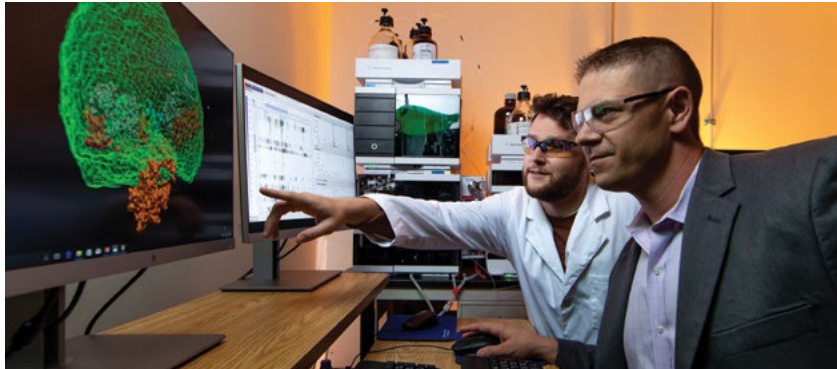


Steven Prior, PhD, MA
University of Maryland School
of Public Health, UMCP



Osamah Saeedi, MD, MS
University of Maryland
School of Medicine, UMB

Selected Research **Partnerships** *continued*



INSTITUTE FOR BIOSCIENCE AND BIOTECHNOLOGY RESEARCH (IBBR)

Joint UMB/UMCP institute with the National Institute of Standards and Technology supports the discovery and acceleration of the development and manufacturing of therapeutics, modern medicines, and vaccines.

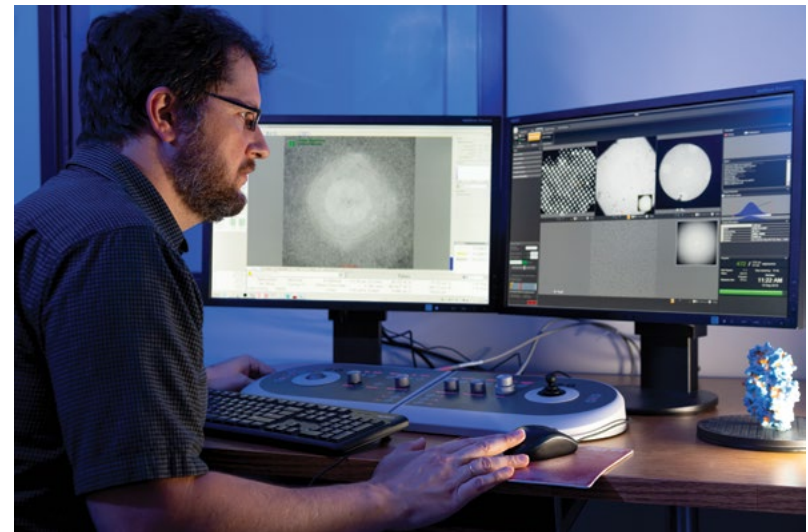
www.ibbr.umd.edu



MARYLAND CENTER FOR ADVANCED MOLECULAR ANALYSIS (M-CAMA)

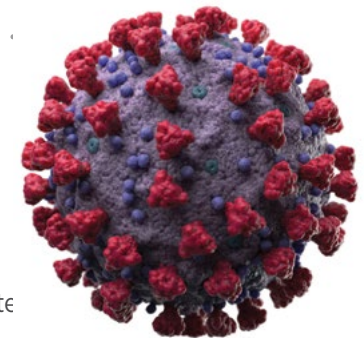
Cryo-electron microscopy technology drives scientific innovation and discovery to advance the research and development of new drugs and medical treatments for disease.

www.ibbr.umd.edu/mcama



COVID-19 CARDIAC REGISTRY, BIG TEN COLLABORATION

Collaborative Maryland team of UMB/UMCP experts in sports medicine, kinesiology, cardiology, radiology, and epidemiology researches COVID-19's effect on student-athlete as part of a consortium of Big Ten colleges.



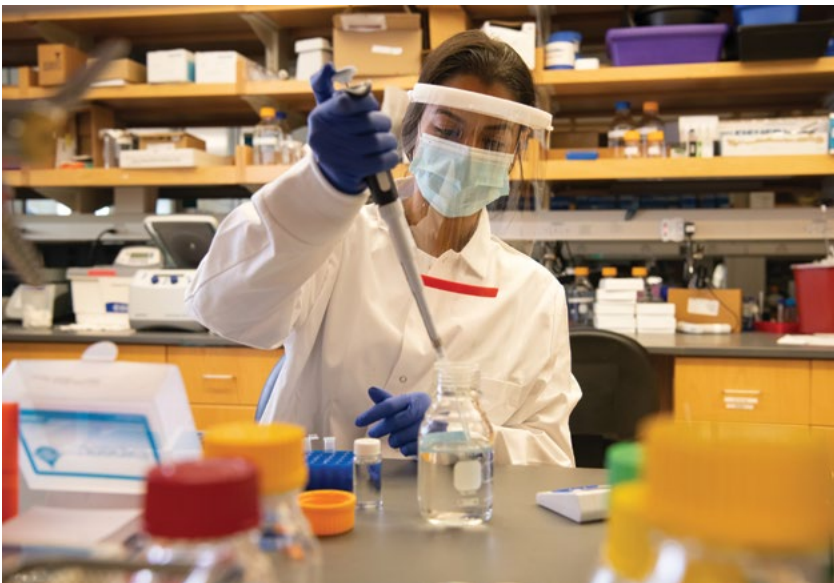
SEED GRANT CHALLENGES

Interdisciplinary, cross-campus research teams seek solutions to the state's most critical and high-profile issues.

www.mpower.maryland.edu/initiatives/seed-grants

CLINICAL AND TRANSLATIONAL RESEARCH COLLABORATIONS

MPower investment helps researchers access resources for clinical training, engage in pilot research, and strengthen bioinformatics infrastructure.



MARYLAND: A Top Research Innovator in the Nation

UNIVERSITY OF MARYLAND RESEARCH RANKINGS

No. 11

AMONG ALL PUBLIC U.S.
RESEARCH UNIVERSITIES

No. 19

IN THE NATION

FOR RESEARCH AND DEVELOPMENT SPENDING

*National Science Foundation | Higher Education
Research and Development Survey
Fiscal Year 2022, Released November 2023*

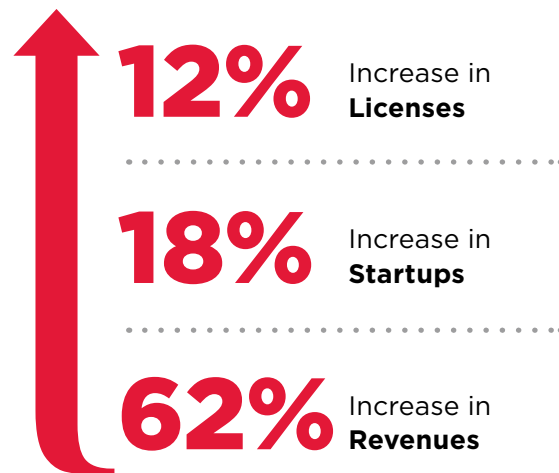
\$1.4 BILLION

FY23 UMB AND UMCP COMBINED AWARDS
FROM FEDERAL, STATE, AND LOCAL
RESEARCH GRANTS AND CONTRACTS

GROWING INNOVATIVE STARTUPS AND TECHNOLOGIES

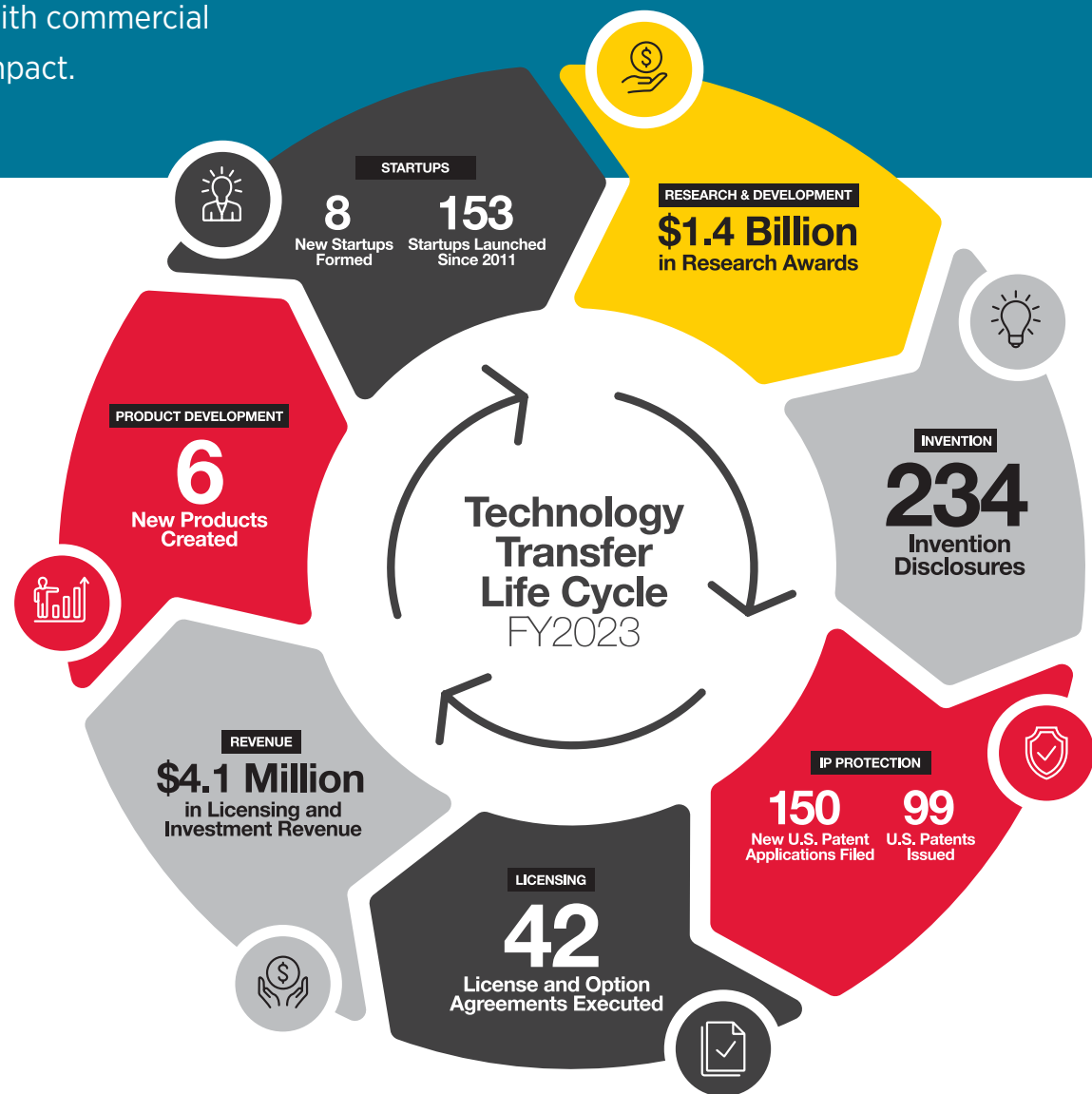
University research yields discoveries with commercial potential, creating positive economic impact.

COMMERCIALIZATION ACTIVITIES | SIX-YEAR TRENDS



Based on six-year averages from FY 2012 - FY 2023

www.umventures.org



Targeted Investments Strengthen Strategic and Economic Priorities Across Maryland

BALTIMORE FUND

Center for Maryland Advanced Ventures

Encourages university-created or -sponsored technology companies to locate and expand in Baltimore City.

- 700+ jobs created or retained
- 68 entities assisted
- Return on Investment (company-generated):
 - \$16+ million in investment and grants
 - \$65 million in revenue

Since 2017

DISCOVERY FUND

University of Maryland Center for Economic and Entrepreneurship Development

Encourages university-created or -sponsored technology companies to locate and expand in Prince George's County.

- New investments totaling \$700,000 to multiple firms:
 - Medcura
 - Ion Storage Systems
 - Hungry Harvest
 - BEIT, Inc.

Since 2022

MARYLAND MOMENTUM FUND

A collaboration between UM Ventures and the University System of Maryland (USM)

Early-stage investment fund supports Maryland-based, USM-affiliated startup companies.

- \$11.7 million invested in 27 companies from 8 USM institutions
- \$125 million raised from 230+ unique co-investors
- 170+ new jobs created

Since 2017

QUANTUM STARTUP FOUNDRY

University of Maryland Center for Economic and Entrepreneurship Development

New commercialization ecosystem in College Park supports quantum entrepreneurs.

- Vibrant quantum ecosystem for entrepreneurs and startups to connect to world-class university research and education
- Extensive partnerships for legal, IP, business mentoring, quantum infrastructure, equipment, and training

Since 2022



MEDICAL DEVICE PROTOTYPING LAB

Center for Maryland Advanced Ventures

Lab positioned within the School of Medicine facilitates the development of lifesaving biomedical devices.

- Empowers faculty physicians and innovators from UMB and bioengineers from UMCP's Robert E. Fischell Institute for Biomedical Devices to create rapid prototypes of innovative biomedical devices with commercial potential
- 19 projects reviewed
- 6 patent applications filed
- 3 startups created

Since 2021

Recent **UM Ventures** Successes

UMB medical device startup **CoapTech** is developing the PUMA-G System, the world's first and only point-of-care ultrasound system for the placement of feeding tubes. The U.S. Food and Drug Administration (FDA)-cleared device is being used in hospitals throughout the country to decrease length of stay, reduce costs, and provide better patient care. A pediatric version of the system is currently in clinical trial.



Hazel Analytics, a global leader in food safety technology, specializes in the use of data-driven technology solutions to monitor regulatory compliance and improve public health. Born in 2014 out of cross-disciplinary research in economics and computer science at UMCP and the University of California, Los Angeles, Hazel Analytics now serves more than 200 global food service and retail brands and over half of the world's 100 largest restaurant chains. In 2022, Hazel announced a partnership with Yelp to provide restaurant and food service hygiene data and health scores. In 2023, the company was acquired by longtime partner Ecolab.



InventWood, founded by Liangbing Hu, PhD, Distinguished University Professor in UMCP's Department of Materials Science and Engineering and director of the Center for Materials Innovation, received a \$20 million SCALEUP award from the U.S. Department of Energy's innovation agency, Advanced Research Projects Agency-Energy. InventWood's SCALEUP project will contribute to the decarbonization of buildings and enable them to store significantly greater amounts of carbon by scaling up a game-changing wood material, MettleWood, which is 60 percent stronger than construction-grade steel but 80 percent lighter, much less expensive, and far more sustainable. InventWood is building an 89,000-square-foot manufacturing facility in Frederick, Md.



IRAZÚ Bio is bridging the divide between academic research and drug development. With a hands-on approach, IRAZÚ identifies, de-risks, and develops the best intellectual property-protected academic research to create innovative life science companies. IRAZÚ's first spin-out company, IRAZÚ Oncology, is advancing a vaccine candidate for colorectal cancer. Its novel platform builds on a technology initially developed at the Center for Vaccine Development and Global Health at the University of Maryland School of Medicine (UMSOM).



KaloCyte is a preclinical stage biotech company that is developing a novel bio-inspired artificial red blood cell, called ErythroMer.

Co-founded by Allan Doctor, MD, director of UMSOM's Center for Blood Oxygen Transport and Hemostasis, KaloCyte works closely with UMSOM and is partnering with the school on a \$46 million Defense Advanced Research Projects Agency grant to develop a synthetic blood product.

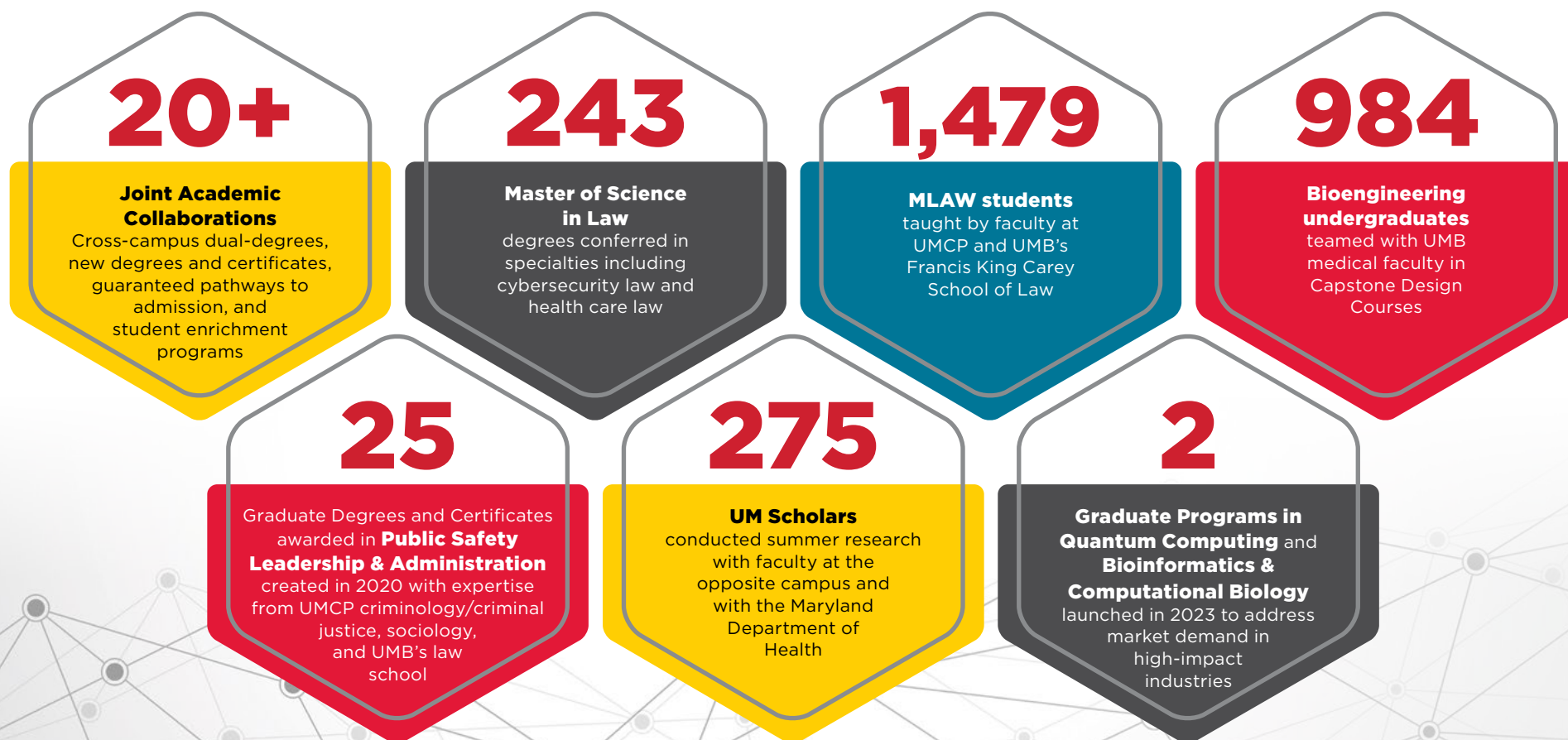


Medcura, a startup based on joint technology between UMCP and UMB, is poised to leverage its proprietary chemistry to carve out a prominent presence in the surgical landscape with its growing product line of hemostatic and wound treatment products. Housed in the Discovery District in College Park and spun out of research from the Fischell Department of Bioengineering, Medcura is scaling up to meet manufacturing demand. It hired staff and expanded its physical footprint by 50 percent in 2023. Medcura received the FDA's Breakthrough Device Designation for LifeGel — the first surgical hemostat to achieve this status.



ACCELERATING THE EDUCATION OF THE NEXT GENERATION OF MARYLANDERS

Through *MPower*, joint educational offerings fuse the strengths and complementary missions of UMB and UMCP to attract students and meet workforce demands.



Selected Educational **Collaborations**

UM SCHOLARS SUMMER RESEARCH

BIOENGINEERING JOINT ACADEMIC PROGRAMS

**RUSSELL BRINSFIELD INTERNSHIP PROGRAM
(AGRICULTURE LAW EDUCATION INITIATIVE)**

MLAW: UNDERGRADUATE PROGRAMS IN LAW

Exceptional, collaborative education program exposes UMCP students to ideas, mentors, and professional opportunities in law not normally available to undergraduates.

www.mlaw.umd.edu



Maryland Carey Law Dean Renée McDonald Hutchins, JD, teaches in MLAW during fall 2023.



In Their Own Words

SUMMER 2023 STUDENT FEEDBACK



The UM Scholars program was a unique experience as opposed to a traditional first-year law school internship. It provided me the opportunity to examine an area of law in a different way than just writing briefs or motions.

— **Joseph Fregel**, JD Candidate | Class of 2025, Francis King Carey School of Law

The experience reminded me that research isn't merely about data and findings; it's about human lives, stories, and striving for change that can positively impact society.

— **Melissa Sierra**, MPH, Doctor of Medicine Candidate | Class of 2026, School of Medicine

The UM Scholars program is a bridge between academic exploration and real-world impact, and I am grateful to have been a part of this journey.

— **Eden Adhanom**, Master of Public Health Candidate | Class of 2024, School of Public Health

The experience I had this summer strengthened my skills in research and confirmed my goal of becoming a physician.

— **Mohammed Ndiaye**, BS Physiology and Neurobiology Candidate | Class of 2024, College of Computer, Mathematical, and Natural Sciences



The program was a great introduction to understanding the dynamics of community health workers and their work in Maryland as a vital part of the public health and health care workforce, and on how the Maryland Department of Health supports their efforts.

— **Lauryn Dunkwu**, Master of Public Health Candidate | Class of 2024, School of Public Health



This experience has reinforced my commitment to public health initiatives aimed at combating the opioid epidemic.

— **Ariana Capati**, BS Bioengineering Candidate | Class of 2024, A. James Clark School of Engineering



This experience made me appreciate the connection between lab research and patient care, realizing the importance research holds to improve patient health outcomes.

— **Jules Einhorn**, BS Neuroscience Candidate | Class of 2024, College of Computer, Mathematical, and Natural Sciences

TACKLING THE STATE'S CRITICAL ISSUES

MPower brings together top thinkers from multiple branches of expertise to redefine challenges, devise solutions, and make an impact in Maryland.

AGRICULTURE LAW EDUCATION INITIATIVE

Creative team of agriculture and law specialists works together to educate and serve Maryland family farmers through expert information and training.

www.umaglaw.org



Three Maryland secretaries — Joshua Kurtz (left), Department of Natural Resources; Serena McIlwain, Department of the Environment; and Kevin Atticks, Department of Agriculture — join College of Agriculture & Natural Resources Dean Craig Beyrouy, PhD, MS, at the 9th Annual Agricultural and Environmental Law Conference in November 2023.



Keynote speaker Anthony Fauci, MD, former chief medical advisor to the president of the United States, at the CUGH conference in Washington, D.C.

CONSORTIUM OF UNIVERSITIES FOR GLOBAL HEALTH (CUGH) CONFERENCE

Collaborative cross-university leadership co-sponsored the world's largest global health conference in April 2023.



SUPPORT, ADVOCACY, FREEDOM, AND EMPOWERMENT CENTER FOR HUMAN TRAFFICKING SURVIVORS (SAFE Center)

First systematic, university-based program that serves victims of human trafficking with comprehensive legal, social, economic, mental health, and medical services.

www.umdsafecenter.org

MPOWER AT A GLANCE

LEADERSHIP



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PRESIDENT, UMB

Darryll J. Pines, PhD, MS
PRESIDENT, UMCP

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Roger J. Ward, EdD, JD, MSL, MPA
PROVOST AND EXECUTIVE VICE PRESIDENT, UMB

RECENT STRATEGIC PROGRAMS AND INITIATIVES

Agriculture Law Education Initiative (ALEI)

Bioengineering Capstone Design Course

Bioengineering Clinical Experiences for Undergraduates

Bioengineering Joint PhD

Center for Brain Health and Human Performance

Center for Maryland Advanced Ventures (CMAV)

Clinical and Translational Research Collaboration Support

COVID-19 Cardiac Registry, Big Ten Collaboration

COVID-19: Seed Grants and Medical Device Challenge

Cross-Institution Academic Degree Pathways to Multiple Schools and Colleges

Institute for Bioscience and Biotechnology Research (IBBR)

Joint Leadership, 2023 Consortium of Universities for Global Health Conference, Washington, D.C.

Joint Research and Innovation Seed Grant Programs

Maryland Blended Reality Center

Maryland Center for Advanced Molecular Analysis (M-CAMA)

Maryland Center of Excellence in Regulatory Science and Innovation (M-CERSI)

Maryland Cochlear Implant Center of Excellence

Master of Science in Law

MLAW: Undergraduate Programs in Law

MPower Professorships

National Institute for Innovation and Manufacturing Biopharmaceuticals (NIIMBL)

Opioid Use Disorders Research Collaboration

Policing Partnership: Master of Professional Studies in Public Safety Leadership and Administration

Robert E. Fischell Institute for Biomedical Devices

SAFE Center for Human Trafficking Survivors

Social Work Program Expansion at Shady Grove

University of Maryland Center for Economic and Entrepreneurship Development (UMCEED)

University of Maryland Institute for Health Computing (IHC)

UM Scholars

UM Ventures



UNIVERSITY OF MARYLAND
STRATEGIC PARTNERSHIP
MPOWERING THE STATE

FOR MORE INFORMATION, CONTACT:

Adrianne M. Arthur

EXECUTIVE DIRECTOR

410.706.5279 | aarthur@umaryland.edu | mpower.maryland.edu