



CENTER FOR
MARYLAND
**ADVANCED
VENTURES**

FY2023 REPORT



Overview

The Center for Maryland Advanced Ventures (CMAV) facilitates technology transfer for UM Ventures and amplifies the impact of university-based research. Strategic initiatives help identify research projects with strong commercial potential while providing programming that supports the advancement of technology commercialization. The initiatives are designed to integrate and work collaboratively with existing offerings from UM Ventures, TEDCO, and the Maryland Department of Commerce.



James L. Hughes, MBA

CMAV is directed by Jim Hughes, senior vice president and chief enterprise and economic development officer at University of Maryland, Baltimore (UMB).

History

Located on the UMB campus, CMAV was created and funded through the University of Maryland Strategic Partnership Act of 2016 and launched on July 1, 2017. The legislation provides \$6.5 million annually to strengthen the commercialization of high-potential, university-based discoveries.

In Action

CMAV funds entrepreneurial staff, grants to startups and growing companies, program costs for promoting technology commercialization, matching support for faculty projects with high potential, student activities and experiences, outreach to the greater Baltimore scientific community, development of intellectual property, and assistance for small business formation. Throughout FY2023, the CMAV team focused on broadening outreach and developing additional programs that support emerging technologies and current areas of need. The following report illustrates the impact of CMAV funding, detailing annual and cumulative achievements of the programs supported by CMAV.



FY2023

**PROGRAM
ACTIVITIES**



MARYLAND MOMENTUM FUND FY2023 ACCOMPLISHMENTS

\$1.7M INVESTED

3 PORTFOLIO
COMPANY EXITS

4 INVESTMENTS IN
NEW COMPANIES

4 INVESTMENTS IN
EXISTING COMPANIES

A collaboration between UM Ventures and the University System of Maryland (USM), the Maryland Momentum Fund (MMF) is an early-stage investment fund that invests in Maryland-based, USM-affiliated startup companies.

The fund is supported by \$16 million from the University System of Maryland; additional investments from USM institutions bring the total size of the MMF to over \$21 million. Exits of three portfolio companies have generated a total of \$1.3 million in returns, which will be used to invest in a mix of new startups and existing companies.

CMAV funds a full-time Managing Director based at UMB and provides additional support and operational expenses. The MMF staff conduct outreach at all USM institutions, soliciting applications for funding and providing advice and support to entrepreneurs across USM.

LIFETIME PORTFOLIO ACCOMPLISHMENTS

\$11.7M
INVESTED

27 PORTFOLIO
COMPANIES

8 USM
INSTITUTIONS

\$125M
MATCHED

230+ UNIQUE
CO-INVESTORS

170+ NEW JOBS
CREATED

PRESIDENT'S ENTREPRENEURIAL FELLOWSHIP

To enhance entrepreneurial education, the President's Entrepreneurial Fellowship program provides UMB and University of Maryland, College Park (UMCP) Robert H. Smith School of Business MBA students the opportunity to learn first-hand the unique challenges of commercializing life science technologies. Mentored by UM Ventures staff, the Fellows work on interdisciplinary teams to commercialize UMB-owned technologies.

This year's cohort was comprised of nine students, representing the School of Medicine, School of Nursing, School of Law, and the Robert H. Smith School of Business.

The Fellows worked on two projects. One project focused on a market analysis of a surgical device for civilian and military trauma surgery. They also researched deals and investments in the niche trauma surgery market. The other project focused on drug repurposing, specifically repurposing approved drugs in diverse indications specifically for enhancing natural killer cell (NK cell) activity for use in cancer cellular immunotherapy. The students conducted wet lab experiments and used a machine learning approach for this project.

GRADUATE RESEARCH INNOVATION DISTRICT

FY2023 ACCOMPLISHMENTS

7 STUDENT TEAMS
FOR GRID PITCH

46 WORKSHOPS

966 PARTICIPANTS

The Grid, located in UMB's Health Sciences and Human Services Library (HS/HSL), has continued to expand its programming to provide entrepreneurial resources and education to students, faculty, staff, and the community.

The Grid Pitch showcase welcomed seven student teams. It was hosted in-person for the second year in a row, and more than 70 individuals from across UMB, Baltimore, and greater Maryland joined to celebrate student entrepreneurship. Thanks to the generous support of the UM Graduate School and the USM Launch Fund, the students were awarded a total of \$12,000 to advance their projects.



SMALL BUSINESS DEVELOPMENT CENTER

FY2023 ACCOMPLISHMENTS

501 CLIENTS
COUNSELED

2K JOBS CREATED
OR RETAINED

38 NEW
BUSINESSES
STARTED

\$12.15M LOANS AND CAPITAL INFUSION
INTO BALTIMORE CITY BUSINESSES

The Small Business Development Center, the Federal small business outreach entity, is supported with funding and space at UMB. The office provides direct assistance to local and University-affiliated entrepreneurs from a wide array of business sectors.

INTELLECTUAL PROPERTY LAW AND ENTREPRENEURSHIP CLINIC

FY2023 ACCOMPLISHMENTS

25 STUDENTS
ENGAGED

60 CLIENTS SERVED
PER SEMESTER

12 PATENT APPLICATIONS
SUBMITTED

19 TRADEMARK
APPLICATIONS
FILED

24 TRADEMARK
APPLICATIONS
ISSUED

10 NEW MARYLAND LIMITED
LIABILITY CORPORATIONS FORMED

The Francis King Carey School of Law Intellectual Property Law and Entrepreneurship Clinic (IPEC) provides second- and third-year law students with valuable work experience. Under the supervision of professors and with the support of two part-time clinical law instructors, students work with clients from UMB and the region to provide general counsel on basic business law, protect trade secrets, prepare nondisclosure agreements, and assist with company formation.

IPEC's new Business Law Track, established in 2021, gained traction with services provided to clients, including drafting non-disclosure agreements, LLC operating agreements, and creating privacy policy statements for electronic communications. They are very active providing research, guidance and actions pertaining to business law in the region.

BALTIMORE FUND

The Baltimore Fund encourages University-created or -sponsored technology companies to locate and expand in Baltimore City as specified in the legislation. CMAV funds the Director of the Baltimore Fund and all expenses of the program. In addition to managing the program, the Director facilitates engagement with Maryland's entrepreneurial ecosystem and its myriad support programs and resources including TEDCO, Baltimore Development Corporation, and the Maryland Department of Commerce. The Baltimore Fund is open to all Maryland public higher education institutions and is administered by UMB.

Since the Fund's creation:

- Baltimore Fund portfolio companies have raised over \$16 million in investment and have grants and sales income exceeding \$65 million.
- Awards have supported companies representing seven Maryland public higher education institutions and a wide array of technologies, including Morgan State University, UMCP, UMB and IMET to support their entrepreneurial activities in Baltimore City and increased outreach to diverse populations.

FY2023 activities included:

- Disbursed 12 grants with 9 new awards which included 5 directly to start up companies.
- Investments in UpSurge and Conscious Venture Labs innovation accelerator to a diverse and inclusive innovation community in Baltimore.
- Continued support of Lexington Market by providing a loan loss reserve to Baltimore Community Lending's targeted microloan program which benefited 13 small business vendors.
- Renewed and ongoing support for UMCP's I-Corps program in Baltimore City at Morgan, Coppin, and University of Baltimore with 49 participants this year.

LIFETIME ACCOMPLISHMENTS

68 ENTITIES ASSISTED

700+ JOBS CREATED OR RETAINED

16 NEW LEASE SUBSIDIES

19 COMPANY EXPANSION AND RELOCATION GRANTS



FY2023

**GRANT
ACTIVITIES**



GRANT APPLICATIONS

The legislation encourages application for external grants to support and enhance CMAV activities, including the growth of UMB's translational research and of Baltimore's innovation ecosystem.

In addition to the direct commercialization grants mentioned in other parts of this report, the following grants were submitted and directly enhance CMAV funding, programming, and activities.

FY2023 Grant Applications

- U.S. Economic Development Administration's (EDA) Tech Hubs in collaboration with GBC (*tech hub designation was awarded in FY2024; up to \$70 million of funding will be available for funded tech hubs*)
- NIH REACH Grant (*\$4 million, four-year grant; awarded in FY2024*)
- Maryland Department of Commerce Anchor Ventures Sponsorship (*\$10,000*)
- Maryland Department of Housing and Community Development SEED grants (*proposals total \$2.15 million; \$125,000 awarded in FY2023*)

MARYLAND DHCD SEED GRANTS

Previously UMB was awarded four SEED grants from the Maryland Department of Housing and Community Development (DHCD) to support 4MLK innovation spaces. These grants are still being managed and administered to support civic innovation spaces in 4MLK and on Maryland's Eastern Shore, as well as renovations of the M&T Bank Exchange. UMB actively collaborated with new partners in the UMB neighborhood to submit another three grant applications. These grants are currently under review and would enhance the services and storefronts in West Baltimore.

ANCHOR VENTURES

FY2023 ACCOMPLISHMENTS

3 PROGRAMMED EVENTS

300 EVENT REGISTRANTS

Anchor Ventures harnesses the collective expertise and influence of local universities, key stakeholders, entrepreneurs, and investors to foster collaboration between and the education of Baltimore’s innovation ecosystem. Led by staff from UMB and Johns Hopkins University, Anchor Ventures provided three programmed events in FY2023, including the first in person event since COVID. Topics included “The Future of Neurotech”, “Cancer Diagnostic Innovations” and “Is Telehealth the New Normal?”.



We also obtained a grant from the Maryland Department of Commerce to support FY2024 programming activities.



In May 2022, Anchor Ventures held the first in-person event since COVID restrictions went into effect in 2020. The topic was focused on innovations in cancer diagnostics.



FY2023

TECHNOLOGY COMMERCIALIZATION



UM VENTURES

Since the inception of UM Ventures in 2012, technology transfer activities at both UMB and UMCP have increased.

In FY2023, UM Ventures recorded 234 new disclosures, executed 42 licenses, and created eight new startups. In addition, 260 patent applications were filed, and 48 patents were issued.

Through the concerted efforts of UM Ventures staff, strategic industry partnerships have been strengthened and the startup portfolio includes more high-profile startups.

COMMERCIALIZATION ACTIVITIES | 6-YEAR TRENDS

From FY2012 through FY2023, the number of licenses and startups and the amount of revenue has been steadily increasing.*

12% INCREASE IN LICENSES

18% INCREASE IN STARTUPS

62% INCREASE IN REVENUES



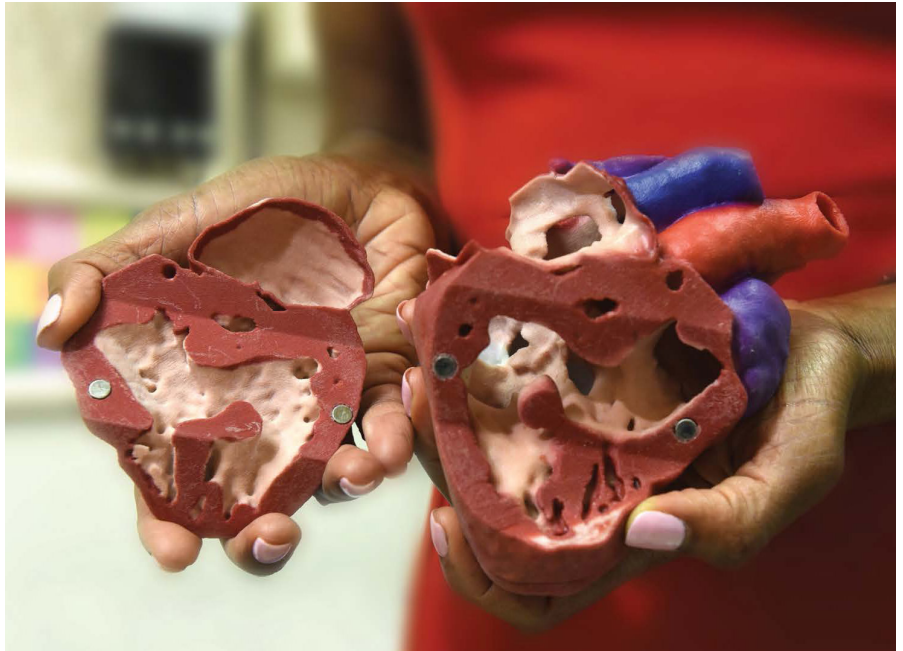
IRAZÚ

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. Their 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. IRAZÚ was founded and is led by Marco Chacón, PhD.

*Based on six-year averages from FY2012 - FY2023.

MEDICAL DEVICE DEVELOPMENT LAB

UMB's Office of Technology Transfer (OTT) team works with leading UMB surgeons to expand the development of novel medical devices and grow UMB's medical device portfolio. Collaboration with the UMSOM supported development of a medical device innovation and rapid prototyping lab. The space is located within the UMSOM to facilitate easy access for surgeons working in the hospital. UMB's OTT team and the Fischell Institute provide direct support enabling CAD drawings, 3D printing, rapid prototyping, and streamlined patent filing.



Since the lab's creation:

- Eleven device projects have been created by UMSOM faculty.
- Three startups have been formed around projects: Lionheart, Protaryx, and Econnect-1.

FY2023 activities included:

- A new full-time staff person was hired in collaboration with the Fischell Institute to augment medical device development.
- Funding seven projects as a result of the Medical Device Sprint Competition.
- Started four additional new projects.
- Contributed to two patent applications and one MII grant

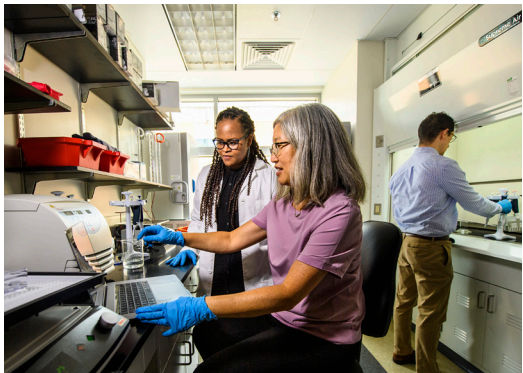
LIFETIME ACCOMPLISHMENTS

19 PROJECTS
CONDUCTED

6 PATENT APPLICATIONS
FILED

3 STARTUPS
CREATED

VENTURES WET LAB



A 650 sq. ft. wet laboratory features molecular and cell biology capabilities as well as specialized equipment for technology validation and testing. Located in the UM BioPark, the lab was opened in FY2020 and is staffed by UMB's Office of Technology Transfer (OTT). In FY2023, three commercial entities based on UMB IP actively utilized the lab.

LIFE SCIENCES IP FUND

The Life Sciences IP Fund (LSIPF), created in February 2018, provides proof-of-concept and external validation funding to accelerate commercialization of technologies at UMB. Supported projects receive project management support along with funding for technology validation and further development. Five projects have resulted in the creation of new UMB startups: Isoprene Pharmaceuticals, Protaryx, GEn1E Lifesciences, E-connect, and RenuBioMed. Protaryx and GEn1E have successfully closed initial financing rounds, and in mid-2021, Isoprene received a \$2 million SBIR Direct-to-Phase II grant from the National Cancer Institute. More than half of LSIPF projects have been medical device technologies, many of which have been prototyped by a newly embedded on-site engineer who is jointly supported through UMB's Office of Technology Transfer and UMCP's Fishcell Institute.

LIFETIME ACCOMPLISHMENTS

\$19M CATALYZED (3RD PARTY)
CAPITAL

19:1 RETURN ON
INVESTMENT

34 EARLY-STAGE
TECHNOLOGIES ASSISTED

5 STARTUPS
FORMED

INSTITUTE FOR CLINICAL & TRANSLATIONAL RESEARCH

Institute for Clinical & Translational Research (ICTR), UMB's first Universitywide interdisciplinary hub for clinical translational research and training, operates as part of a consortium with JHU. UMB's OTT team works closely with the UMSOM on ICTR and provides a joint program manager to facilitate identifying promising new technologies. In addition to annual funding, in FY2023, CMAV supported patient-oriented research and Phase II clinical trials through ICTR.

A total of 15 projects were funded in FY2023 through the following funding programs:

Accelerated Translation Incubator Pilot (ATIP) Grant Program

ATIP supports innovative, translational research projects

- 16 applications were received and 9 were funded for a total of \$400,000
- Collaborations across the Schools of Medicine, Pharmacy, and Dentistry, and with UMCP and UMBC

Community Engaged Research (CEnR) Grant Program

CEnR specifically supports projects addressing health problems through community-engaged implementation.

- 4 applications were received and 2 were funded for a total of \$78,350
- Collaborations across the Schools of Medicine, Nursing, and Social Work and with UMBC and non-USM institutions.

Nephrotic Syndrome Research Program (NSRP) Grant

NSRP was a one-time opportunity to support innovative, translational research applications that address issues of prime concern directly relevant to Nephrotic Syndrome.

- 6 applications were received and 4 were funded for a total of \$360,000

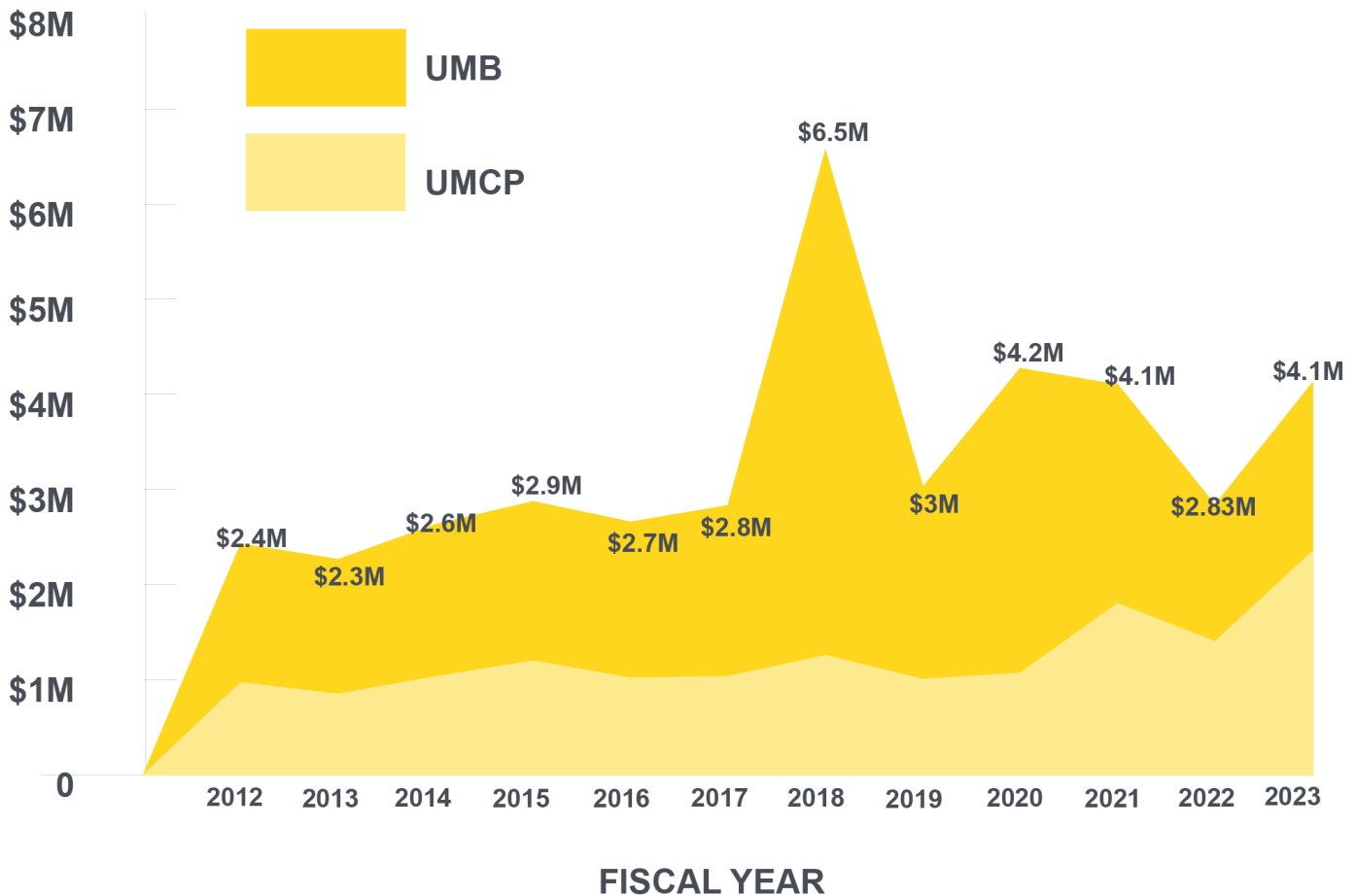
LIFETIME ACCOMPLISHMENTS

20% PROJECTS HAVE RESULTED
IN IP DISCLOSURES

VALUE OF LICENSED TECHNOLOGIES

It is difficult and highly speculative to value technologies when they are first licensed; however, technology transfer revenues to UM Ventures have averaged \$4.1 million over the past five years.

REVENUE RECEIVED



UMB Investment Portfolio

External investment is a good indicator of the value of our technologies and the strength of our companies. To date, UMB has invested \$1.4 million in the most promising UMB startups, and those companies have received \$88 million in follow-on capital investments, which is an 18:1 external match ratio to our initial investment.

\$88M FOLLOW-ON CAPITAL INVESTMENT

18:1 EXTERNAL MATCH RATIO

FY2023

**ACCOMPLISHMENTS
AND
RECOMMENDATIONS**



FY2023 SUMMARY

1. Commercialization activities of invention disclosures have continuously increased as evidenced by the increasing number of startups, licenses and revenues over the past 10 years.
 2. Continued to expand programming and outreach to interested USM faculty, staff, and students on technology transfer opportunities and to develop entrepreneurial skills.
 3. Provided direct support to entities affiliated with UMB, UMCP, UMBC, UMES, UMGC, Towson, Coppin and University of Baltimore.
 4. Extended support of UMCP I-Corps programming at Morgan State, University of Baltimore, and Coppin State, which has successfully brought additional resources to Baltimore City and expanded the entrepreneurial capabilities of these institutions while reaching a more diverse population.
 5. Provided input and support to multiple federal grant opportunities that would bring additional resources and funding towards CMAV commercialization activities
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RECOMMENDATIONS FOR FY2024

1. Strengthen connections with local angel networks and national venture capital companies.
2. Continue to expand outreach to and inclusion of underserved populations in activities.
3. Create additional opportunities and programs to educate interested USM faculty, staff, and students on technology transfer commercialization and entrepreneurial skills.
4. Create additional collaborative programming with other USM institutions and pursue new external funding opportunities.
5. Leverage federal grants into additional commercialization activities.
6. Plan and develop programming for CMAV-supported space in 4MLK, the BioPark's new development project.