

The Board of Regents Committee on Economic Development and Technology Commercialization

Minutes of the Public Session

September 12, 2019

The Committee on Economic Development and Technology Commercialization of the University System of Maryland (USM) Board of Regents met in public session on 12:30 pm on Thursday September 12, 2019 at the University of Maryland Global Campus in Adelphi, in the College Park Marriott Hotel & Conference Center. Regent Leggett called the meeting to order at 12:45 am

Regents present were G. Attman, K. Schulz, T. Sadowski, I. Leggett, L. Gooden, B. Gossett, and R. Wallace. Also present included Chancellor Caret, J. Lenzer, E. Herbst, R. Gist, P. Robilotto, D. Kunitz, D. Drake, and J. Hughes.

Featured Startup – Matt Boxer, COO of Veralox (Information Item)

Matt Boxer, PhD, the COO of Veralox, a recent Momentum Fund portfolio company, provided an update on the company. Veralox is developing a drug candidate for the treatment of two different medical conditions with great unmet needs. The first condition is HIT/T, a serious blood coagulation condition. The second condition is Type 1 diabetes. Veralox has a great scientific advisory board and is speaking with other scientific advisors at the University System of Maryland. The company has great results in animal models for both conditions and just closed a \$5.4M seed round, which included Sanofi Ventures as a co-investor. The USM Maryland Momentum Fund showed early interest in Veralox. Dr. Boxer said that it was catalytic to have solid diligence and to sharpen them for presentation to other investors; the company wouldn't be here without the Momentum Fund investment. TEDCO and BHI were also very helpful. The next step is toxicity testing, which is costly. The company is excited about the potential of having the University of Maryland, Baltimore (UMB), with its expertise and proximity, as one of the major sites of their clinical trials. Veralox is looking to hire high-level clinical personnel. Dr. Boxer said Veralox has appreciated the support from Maryland. The core team has set their roots here and looks forward to growing in Maryland. The potential to affect patients who acutely need it is really what drives the co-founders toward successful commercialization.

Regent Wallace asked about competition. Dr. Boxer explained that other people are trying to preserve beta cells for T1D, but no one is doing it in this way or can as selectively target as well. There is potential for an oral medication for HIT/T, but that won't work for many patients in critical condition, and it would also present a bleeding risk. Regent Leggett asked about the exit strategy. Dr. Boxer reported that acquisition could be possible in 2, 4, and/or 6 years, depending on the results obtained at key inflection points. Mr. Sadowski commented that this was a good example of using USM resources strategically for impact.

The USM Momentum Fund -- Claire Broido Johnson, Managing Director (Information Item)

Mr. Sadowski introduced Claire Broido Johnson and commented that that the USM is extremely glad to have her join the team as the lead of the Fund.

Ms. Broido Johnson mentioned that the Fund has a new website, momentum.usmd.edu. Ms. Broido Johnson stated that coming from the private sector, she is a strong believer in both returns and economic development and that she sees a spot in the early-stage startup ecosystem for this stage of fund. She noted that many people with the means to invest regionally have built their wealth in less risky sectors such as real estate and government contracting and that there is also a lack of upper-level managers for early-stage manager, again due to a risk-averse workforce, both of which underscore the need for the Momentum Fund in this geography. So far, the Fund has invested \$2.5M matched with \$11.2M, for a 4.4X match. Ms. Broido Johnson stated that she is excited to expand the top portion of the funnel and provided examples such as being in the final stages of looking at an UMCES company and meeting with entrepreneurship leads at Towson University.

Regent Attman asked why the portfolio does not include a cybersecurity company yet. Ms. Broido Johnson stated that cyber companies have been reviewed, that Ron Gula, an experienced cybersecurity executive, is on the Advisory Board, and that she is working closely with cyber-focused programs at UMBC. Mr. Sadowski commented that the Fund was recently successful in moving quickly for Retrium, a software company, and that speed could help capture more cybersecurity companies, some which raise financing more quickly. Ms. Broido Johnson noted to keep in mind, however, that the Fund is strategically positioned to catalyze investment and help companies that might not have ready access to funding. Regent Attman noted that the co-investment match has exceeded the initial goal, which Mr. Sadowski confirmed as 1:1 minimum with a goal of 2:1.

Ms. Broido Johnson discussed several of her prior accomplishments, including inventing the idea of a solar power purchase agreement and leading the responsible 9-month deployment of a large federal stimulus program at the US Department of Energy. She loves building new companies and expanding them. She has worked with companies primarily outside of Maryland, where much clean energy work happens. Ms. Broido Johnson is a proud resident of Federal Hill, and her family loves living in Baltimore and Maryland. She is committed to growing the entrepreneurship ecosystem here and excited to help entrepreneurship in Maryland, since she has been doing that for 20 years outside of Maryland. She is also excited to expand outside of clean energy as well.

Ms. Broido Johnson has talked to the ecosystem broadly about how the fund is doing after two years of existence. Shortly, two companies are up for consideration that she has worked with since the beginning of the process, as opposed to. Ms. Broido Johnson re-iterated that she is really trying to expand the top of the funnel. She would love to see companies come from all 12 of the institutions. She has looked at over 60 companies since she has been in the role and provided advice. In FY 19, the Funds metrics regarding diligence are industry standard as far as how many make it through to investment. She is trying to talk to as many deans as possible and appreciates any help in getting the word out about the Fund.

Ms. Broido Johnson responded to questions about geographical requirements and how to get other universities, beyond UMCP and UMB to be a part of the Fund. She responded that companies must be located in Maryland to be considered for the Fund and that marketing of the Fund is required.

Ms. Herbst agreed and said that UMCP, UMB, and UMBC, as research-heavy institutions have been in focus but the Fund is evolving and she anticipates seeing more investments from companies related to other institutions. Ms. Lenzer commented that UMCP has many resources for entrepreneurship, which has created a backlog for this type of funding. They hope to start bringing this programming to other institutions, which should increase the pipeline. Mr. Sadowski commented that a lot of companies are manufacturing or operating out of other parts of the state, which broadens the geographic impact.

Regent Wallace commented that the USM needs to be intentional about how to get the word out.

Regent Leggett added that the intent needs to be very clear that USM has jumped through every hoop to reach every part of the state and the intent and outreach needs to be demonstrable.

Regent Attman said that Ms. Broido Johnson might find that she can bring expertise for companies that aren't quite ready yet, which the former director did.

Ms. Herbst stated that the Fund is aimed after angel funding and before Series A financing. There is some conversation to see if USM should be participating earlier, not with this money but with other money.

Mr. Sadowki commented that a lot of deals have gotten assistance through TEDCO MII and other early programs, such as MIPS, which does cover a wide geographic range. MIPS has done a tremendous job. Lately, states are looking at how to better leverage assets. In a Brookings Study for Pennsylvania, MIPS was identified as a leading program. Mr. Sadowski then introduced Mr. Joe Naft.

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

Mr. Naft stated that Ronnie Gist, the Associate Director, is consistently traveling across the state. If you normalize by the population, Ronnie is reaching out to companies at about the same rate, which has been affective. The program was formed in 1987 to see how else research expertise and facilities could help companies, particularly startups, in Maryland. It is a model that has worked very well and continues to work well. The main criteria is commercialization potential; will it create jobs in the state? They also review proposals for technical merit. Mr. Naft stated that another differentiating factor is that they can work with companies that have IP already to bring to the table. Half of the time, the company knows a faculty member they want to work with, and half of the time, MIPS helps them find a researcher. Another differentiator is that the company buys in. Mr. Naft said that the program has excellent metrics and a huge return to the state, with a 38:1 leverage for each dollar. The budget peaked before the recession but has been going down. The program is oversubscribed, and more funding could be used to fund good projects.

Dr. Caret asked if MIPS funding was a state allocation initially. Mr. Naft responded that it is a portion of the UMCP budget, with the exception of funding via TEDCO and the Department of Natural Resources to be allocated for specific types of projects.

Mr. Sadowski stated that the USM is looking for ways to increase the funding available to this well-established program with an excellent track record.

**USM Economic Development Update – Tom Sadowski, Vice Chancellor for Economic Development
(Information Item)**

Mr. Sadowski reviewed the latest updates. USM is interested in looking at increasing partnership with industry, and the OED will be working with institutions to understand how to best help. Mr. Sadowski presenting information on Workforce Development, much of which involves partnerships with industry as well. Ms. Ryan provided the latest USM Venture Development Report, with a full year of data to report for ventures the USM has meaningfully assisted in some way. Highlights included over \$3M of dilutive or non-dilutive funding deployed to startups and small businesses over the period from January to June of 2019.

The meeting ended at 2:00pm.

Respectfully submitted,

Isiah Leggett, Chair
Committee on Economic Development
and Technology Commercialization

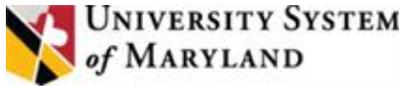


**Board of Regents
Committee on Economic Development and Technology Commercialization**

**November 19, 2019
University of Maryland, Baltimore
Saratoga Building
220 North Arch Street, Baltimore, Maryland**

Public Session Agenda

- (1) **Featured Start-Up: BondTrue, LLC** – Aimee Martin, CEO (Information Item)
- (2) **University of Maryland BioPark Update** – Jim Hughes, Senior Vice President and Chief Enterprise and Economic Development Officer, University of Maryland, Baltimore (Information Item)
- (3) **USM Office of Economic Development Update** – Tom Sadowski, Vice Chancellor for Economic Development (Information Item)
 - a. Momentum Fund
 - b. Marketing Campaign
 - c. Economic Impact Report(s)
 - d. USM Competitiveness
 - e. 2020 Legislative Session
- (4) **Greater Washington Partnership – Capital CoLAB Project** – MJ Bishop, Associate Vice Chancellor, Director, William E. Kirwan Center for Academic Innovation (Information Item)
- (5) **Partnering with Industry to Drive Innovation** – Julie Lenzer, Chief Innovation Officer, University of Maryland, College Park and John Paul Sawyer, Director of Strategic Research Initiatives, University of Maryland, College Park (Information Item)



BOARD OF REGENTS

SUMMARY OF ITEM FOR ACTION
INFORMATION OR DISCUSSION

TOPIC: Featured Startup - BondTrue

COMMITTEE: Economic Development and Technology Commercialization

DATE OF COMMITTEE MEETING: Tuesday, November 19th 2019

SUMMARY: Aimee Martin, CEO of BondTrue LLC, will present her medical device company, which was founded in 2016. BondTrue has been awarded \$200,000 by the Maryland Industrial Partnerships Program (MIPS) to continue research and development of the company's patented device, which aims to automate the process of surgical incisions and closures. The company is working with engineers at the University of Maryland, College Park.

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

FISCAL IMPACT: There is no fiscal impact

CHANCELLOR'S RECOMMENDATION: n/a

COMMITTEE RECOMMENDATION:

DATE:

BOARD ACTION:

DATE:

SUBMITTED BY: Tom Sadowski (410) 576-5742



BondTrue[®]

Surgical Incision & Closure Device

11.19.19

Motivation

- Precision of surgical incision and stapling processes can be time consuming.
- Poorly incised wounds and inadequately approximated wounds can result in delayed wound healing, poor scarring, post-operative infections, and higher healthcare costs.
- Surgical site infections (SSI) are a driver of (3-5%) of healthcare complications, especially those caused by Multidrug Resistant bacteria (MDR), “a global health emergency that will seriously jeopardize progress in modern medicine” -WHO.
- SSIs are the most common and costly of all hospital-acquired infections, accounting for **20 percent of all hospital-acquired infections**. They occur in an estimated **2 percent to 5 percent** of patients undergoing inpatient surgery. The estimated annual incidence of SSIs in the U.S. ranges from **160,000 to 300,000, and the estimated annual cost ranges from \$3.5 billion to \$10 billion**. On average, a surgical site infection increases the hospital length of stay by **9.7 days**...





BondTrue is a patented (#9,408,672) device invented by a surgeon that automates the process of surgical incisions and closures.

BondTrue Value Proposition

IMPROVED SURGICAL OUTCOMES FOR PATIENTS	LOWER COST FOR SURGERIES
<ul style="list-style-type: none">•Reduce surgical site infections•Perfectly align and evert skin closure•Shorten healing time•Reduce scarring with clean edge incision•Decrease post-operative drainage•Decrease time and risk under anesthesia•Improve patient care and satisfaction with minimal scarring and shorter healing time	<ul style="list-style-type: none">•Improved accuracy of surgery through automation/standardization•Time in surgical suite reduced•BondTrue is simple to use for trained surgical assistants•No assistance needed to manually push skin together for closure•Device may be adapted for telesurgery/robotics

MIPS Project Overview

Phase I (2017-2018)	Phase II (2018-present)
Designed and developed an improved prototype after several iterations	Will deliver optimized final designs of the BondTrue device for <ul style="list-style-type: none">• Pivotal research/FDA trials• Animation development• Presentations (e.g., investor, marketing, manufacturing, partnership)

Key Milestones For BondTrue

2016-2017	2018	2019	2020-2021
<p>Awarded first patent</p> <p>MIPS Phase I</p> 	<p>MIPS Phase II</p> <p>Started TEDCO MdPACE Program to expedite regulatory path</p> <p>Awarded State of Maryland ExportMD Grant to attend Medica conference in Germany for international regulatory approval and distribution discussions</p> 	<p>MIPS Phase II</p> <p>FDA pre-submission meeting</p> <p>Second patent filed</p> <p>NSF and NIH SBIR Grant applications filed</p> <p>DOD grant discussions</p> <p>Awarded SBIR bootcamp</p>	<p>Prototype testing and refinement</p> <p>Fundraising (grants, private)</p> <p>Ongoing customer discovery</p> <p>Building team, marketing, branding, advertising, partnership/manufacturing/partnering/licensing, etc.</p>

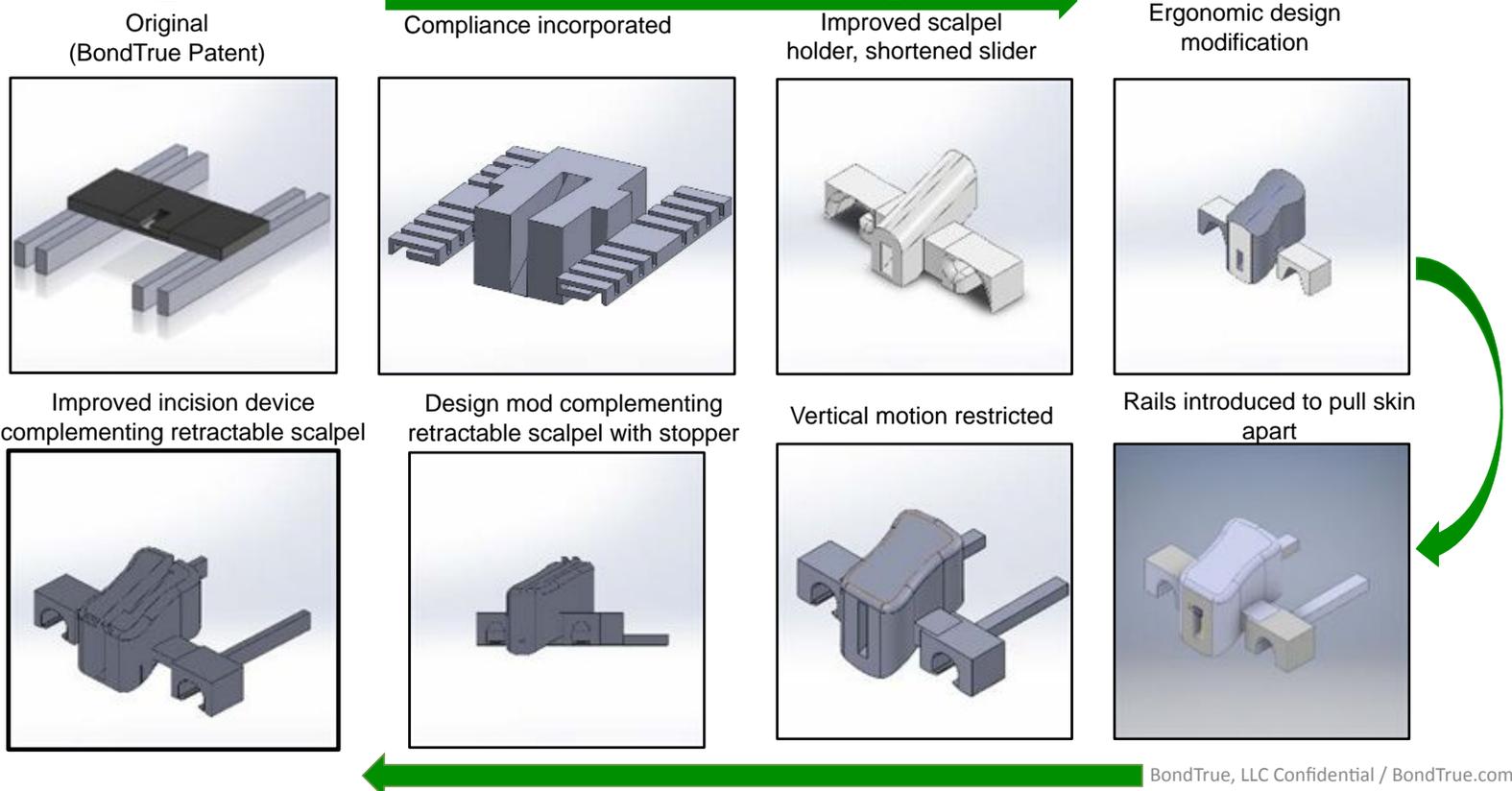
Commercial Impact

- Millions of procedures are performed each year that could benefit from this technology (e.g., appendectomy, hysterectomy, total joint replacement, abdominal surgery, colectomy, breast surgery, spine surgery, etc.)
- Has scalable commercialization value with a single product line bearing a potential of tens of millions of units/year with a potential revenue generation of greater than \$100 million/year within five years.
- The total available market size in the United States for the BondTrue device is estimated at approximately \$1.5 billion.

MIPS Phase I Summary

- Reviewed patent drawings and propose approach to prototyping
- Explored various materials for prototype
- Developed designs of components for prototypes of improved devices (e.g., appropriate combination of geometrically-complex 3D printed components)
- Fabricated and tested initial prototypes for two devices
 1. Surgical blade holder
 2. Stapler holder
- Initiated an FEA model for designing prototypes

Design Evolution for Surgical Blade Holder



MIPS Phase I Deliverables

1. Identified 3D printing as suitable for realizing prototypes
2. Identification of biocompatible material options and appropriate printers for 3D printing
3. Prototype designed for 3D printing
4. Fabricated initial prototype for incisions and stapling
5. Fabricated components with enhanced compliance for prototype identified after testing and assessment by BondTrue

MIPS Phase II R&D Tasks

1. Continued to test prototypes from Phase I in order to identify refinements for an improved prototype ready for FDA trials
 - a. Enhance the alignment of rails within the device
 - b. Develop additional closure methods utilizing adhesives and or/ sutures
 - c. Determine optimal spacing of device from incision edge
2. Fabricated refined prototypes using 3D printing with biocompatible printing and bonding materials
3. Completed the FEA modeling tool for optimizing the design and cost of components for injection molding
4. Designed and fabricated components of prototype that can be potentially injection molded for commercial scale-up

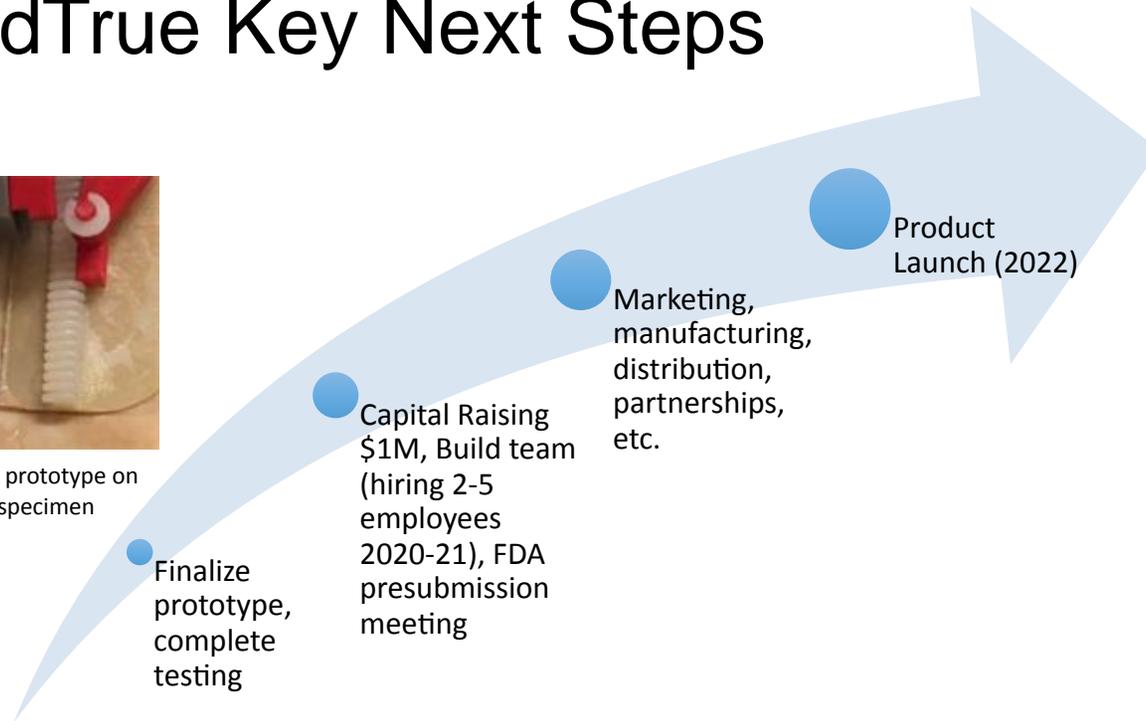
MIPS Phase II Deliverables

1. Determine an appropriate method for applying CGF Hydrocolloid adhesive patches to the base components
2. Refined the designs and assisted in determining the manufacturing conditions and materials for injection molding of the devices at a commercial scale through a local injection molding company.
3. Completed the FEA modeling for optimizing the re-design of the components for performance under different incision and stapling conditions, as well as to determine geometries that minimize cost for manufacturing.
4. Delivered optimized final designs of the BondTrue incision and stapling devices to be used in FDA trials for approval.

BondTrue Key Next Steps



Dr. Martin Testing prototype on porcine skin specimen



BondTrue Team



Dr. Zach Martin, MD
CSO



Aimee Martin, MBA
CEO



Hugh Bruck, PhD
Engineer



Kenneth Perry, PhD
Engineer



Jack Kent, MBA
Regulatory



Shree Koushik, PhD
Regulatory



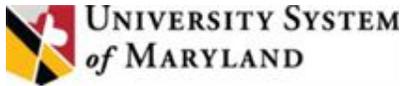
For more information about
BondTrue, please contact

Aimee Martin
CEO

aimeepmartin@gmail.com

(301) 529-3787

BondTrue.com



BOARD OF REGENTS

**SUMMARY OF ITEM FOR
INFORMATION**

TOPIC: UM BioPark Update: 4 MLK

COMMITTEE: Economic Development and Technology Commercialization

DATE OF COMMITTEE MEETING: Tuesday, November 19, 2019

SUMMARY: James Hughes, Senior Vice President and Chief Enterprise and Economic Development Officer at the University of Maryland, Baltimore, will present progress at the UM BioPark and plans for 4 MLK, a 330,000 SF lab/office building with civic event space and a 300 space parking garage.

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

FISCAL IMPACT: There is no fiscal impact

CHANCELLOR'S RECOMMENDATION: n/a

COMMITTEE RECOMMENDATION:

DATE:

BOARD ACTION:

DATE:

SUBMITTED BY: Tom Sadowski (410) 576-5742



BIO PARK

THE UNIVERSITY OF MARYLAND

BUILDING A COMMUNITY
WHERE SCIENCE, IDEAS AND
PEOPLE **WORK TOGETHER.**

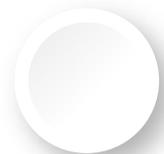




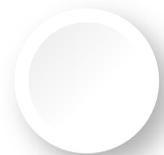
GOALS



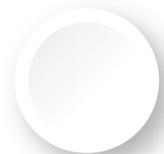
Tech transfer



Industry collaboration



Baltimore City biotech cluster



Community development

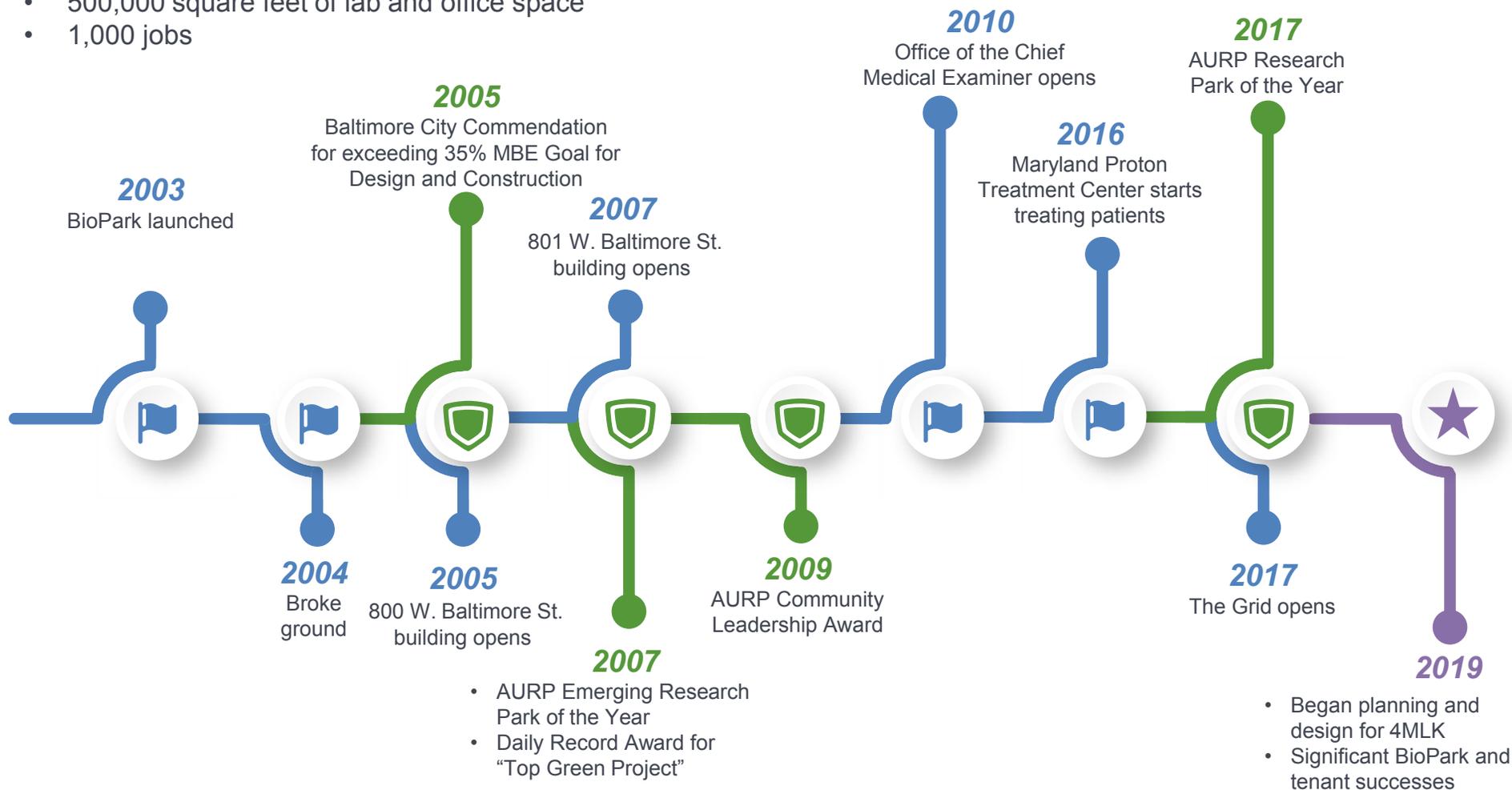


**Entrepreneurial opportunities for
UMB students and graduates**

ACCOMPLISHMENTS

HIGHLIGHTS

- Acquired 14 acres of land through nearly 30 transactions
- \$450 capital investment
- 500,000 square feet of lab and office space
- 1,000 jobs



RECENT SUCCESSES

- Paragon acquired by Catalent for \$1.2 billion
- UMB wins \$200 million NIH vaccine grant in collaboration with Pharmaron
- Illumina Solutions Center opens first East Coast facility
- UMB breaks ground on new Community Engagement Center
- Maryland Proton Treatment Center treats its 2,000th patient



UMB COMMUNITY ENGAGEMENT CENTER



ILLUMINA SOLUTIONS CENTER

BIOPARK TENANTS



PARAGON
GENE THERAPY



MARYLAND FORENSIC
MEDICAL CENTER

IMMUCISION
BIOTHERAPEUTICS, LLC.

LIFEIMMUNE



TRANSLATIONAL
HOLDINGS, INC.



TLI

DEPARTMENT OF
OTORHINOLARYNGOLOGY -
HEAD AND NECK SURGERY

DEPARTMENT OF
RADIATION ONCOLOGY

4MLK LOCATION





PHASE 1

330,000 GSF MIXED USE BUILDING THAT BECOMES THE CONNECTOR BETWEEN W. BALTIMORE, THE BIOPARK, UMB, AND DOWNTOWN.

LAB/OFFICE SPACE TO FOSTER RESEARCH AND INNOVATION

GROUND FLOOR ACTIVITY TO CREATE A PUBLIC DESTINATION AND URBAN AMENITY.

RENOVATION OF THE **HISTORIC POPPLETON** FIREHOUSE INTO A PUBLIC AMENITY AND REMINDER OF HISTORIC BALTIMORE.

CONNECTIVE AND VIBRANT PUBLIC PLAZA ACTIVATED BY W. BALTIMORE STREET, UMB AND THE DEVELOPMENT.

PHASE 2

A SECOND **270,000 GSF MIXED USE BUILDING** THAT FURTHER SUPPORT THE GOALS OF THE BIOPARK AND COMMUNITY.







INNOVATION SPACE

- 120,000 SF Lab/Office Space
- District Hall

CENTER FOR MARYLAND ADVANCED VENTURES

- UM Ventures
- IP and Business Law Clinic
- SBDC
- Maryland Momentum Fund
- Fischell Institute for Biomedical Devices

BUILD-TO-SUIT SPEC SPACE

- 150,000 SF

CIC PHILADELPHIA

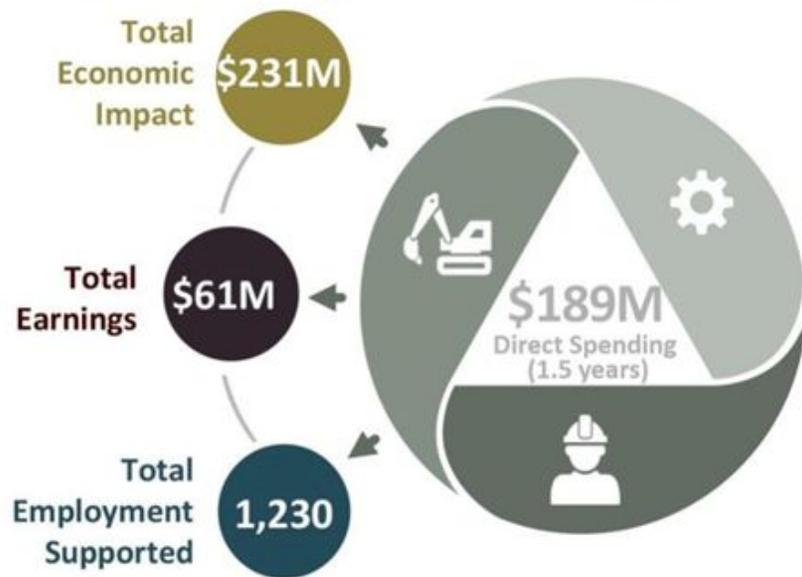


UNIVERSITY OF MARYLAND
UM VENTURES

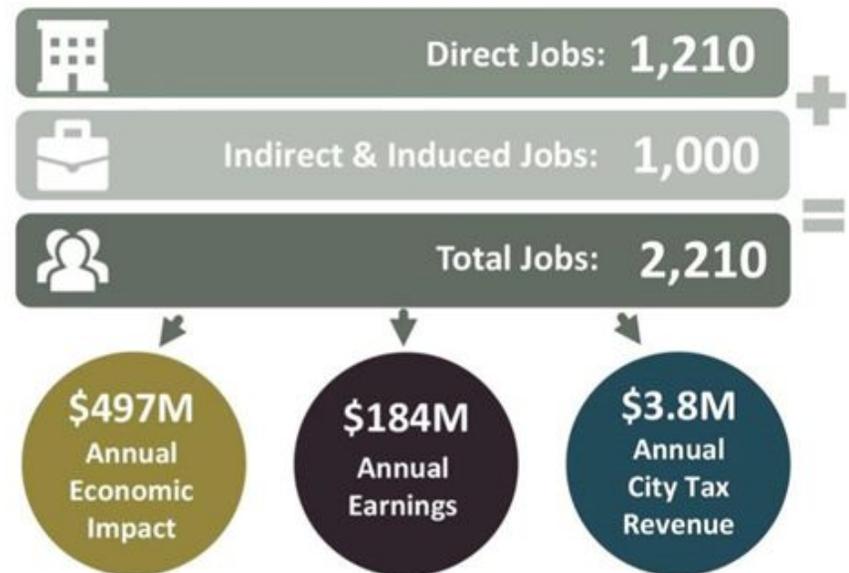
4MLK POTENTIAL ECONOMIC IMPACT

4MLK is a 330,000 SF lab/office building with civic event space and a 300 space parking garage.

Construction Impacts in Baltimore

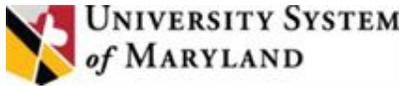


Operations Impacts in Baltimore



Estimated Construction Jobs Accessible to Neighborhood Residents **38%**

Estimated Operations Jobs Accessible to Neighborhood Residents **32%**



BOARD OF REGENTS

SUMMARY OF ITEM FOR ACTION
INFORMATION OR DISCUSSION

TOPIC: USM Office of Economic Development Update

COMMITTEE: Economic Development and Technology Commercialization

DATE OF COMMITTEE MEETING: Tuesday, November 19th, 2019

SUMMARY: Vice Chancellor Sadowski will provide an update from the USM Office of Economic Development, including the Maryland Momentum Fund, the “Maryland Open for Business” marketing campaign partnership, development of strategic USM Economic Impact Reports, USM Competitiveness discussion material, and objectives related to the 2020 Legislative Session.

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

FISCAL IMPACT: There is no fiscal impact

CHANCELLOR’S RECOMMENDATION: n/a

COMMITTEE RECOMMENDATION:

DATE:

BOARD ACTION:

DATE:

SUBMITTED BY: Tom Sadowski (410) 576-5742

USM Economic Development

*Briefing for Regents Committee for Economic
Development Tech Commercialization*

November 19, 2019



USM Economic Development *Updates*

- Maryland Momentum Fund
- Marketing Campaign
- Economic Impact Report(s)
- USM Competitiveness
- 2020 Legislative Session



USM Momentum Fund

Portfolio



UMCP IP and Alum; May 2017
 \$198K invested, \$1.2M round
 World's most advanced wood burning stove



UMB IP, Towson Alum; Aug. 2017
 \$250K invested, \$1.14M round
 Exoskeleton robot to reverse foot drop for stroke victims
Raised \$600K follow-on round



UMCP IP, Alum; Jan. 2018
 \$350K invested, \$1.5M round
 Advanced pulse jet engine



UMCP Alum; Nov 2018
 \$300K invested, \$1.035M round
 High caffeine tea, energy drink product



UMCP IP; Feb. 2019
 \$300K invested, \$675K round
 Advanced semipermeable pavement system



UMCP Alum; Apr. 2019
 \$400K invested, \$1.6M round
 Agile software development management product



UMBC/UMCP Alum; July 2019
 \$250K invested, \$1.3M round
 Tissue regeneration stem cell company



UMB IP and Alum; July 2019
 \$500K invested, \$5.4M round
 Anticoagulant drug, therapeutics for rare blood disorders



UMB IP and UMB Professor, Oct. 2019
 \$245K invested, \$1.5M round
 Cell-based therapy for cardiovascular disease



UMCES Alum; Oct. 2019
 \$150K invested, \$600K round
 Measures the biomass of shrimp using sonar

MINNOWTECH

MMF Investments to Date: \$2.9M; matched by \$15.9M (>5.4X match)
Average investment: \$294K; average deal size: \$1.6M

Co-Investors (sample)

Sanofi, Middleland Capital, Abell Foundation, Lord Baltimore Fund, angel investors, Chesapeake Bay Seed Capital Fund, Dingman Angels



USM Momentum Fund

Advisory Board Current and New Members

- Lily Bengfort, CEO – UAS Safeflight
- Steve Dubin, Principal – SDA Ventures
- Rick Kohr, CEO – Evergreen Advisors
- Kyp Sirinakis, Managing Partner - Epidarex
- Jacob Vogelstein, Partner - Camden Partners
- David Wise, EIR - UMB

- New members:
 - Paul Silber - serial investor and entrepreneur. Helped found Blu Ventures
 - Jeff Cherry – Conscious Venture Lab; West Baltimore incubator
 - Angela Singleton - Tedco Builder program
 - Guy Phillipelli - Squadra VC
 - Tim Braue - lawyer at Nemphos Braue – supporting early stage companies in area
 - Greg Cangialosi – serial entrepreneur, founder of Baltimore Angels

2020 Legislative Session

MD Technology Infrastructure Fund 2.0 (formerly EXCEL Maryland)

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

Regional Institution Strategic Enterprise (RISE) Zone

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

Maryland Tech Internship Program

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

Maryland Industrial Partnerships (MIPs)

- Looking for supplemental funding opportunities (internal/external)

USM Economic Development Strategy 2020

TALENT

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

CULTURE

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

CAPITAL

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

PLACE

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

MARKETING

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



Where are they now? FY19 Featured Startups

- **Mindstand Technologies**, a UMBC student-led cybersecurity company [launched its beta product](#) and has several paying customers, including UMBC.
- **Ion Storage Systems**, a UMCP faculty-led energy storage company, [received an \\$8M investment](#).
- **NextStep Robotics**, a UMB IP-based personalized robotic therapy company led by a Towson grad (and a Momentum Fund portfolio company), was awarded a [\\$1M cooperative agreement](#) with NIH, worth up to an additional \$4.4M over 4 years.

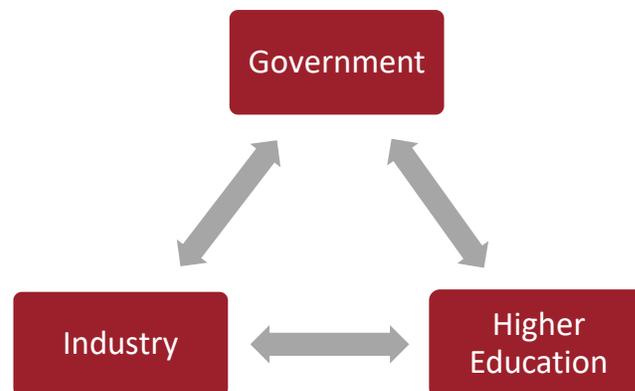
Maryland's Competitiveness

Maryland's economic prosperity is driven by its innovation-led, *advanced industries*. These industries are anchored by world-class university and federal research assets and sustained by a significant talent base. According to The Brookings Institution, "Advanced industries encompass the nation's highest-value economic activity. As such, these industries are the country's best shot at innovative, inclusive, and sustainable growth." (Source: *Brookings Institution, America's Advanced Industries—February 2015*)

Advanced industries rely on technology, research and development, and STEM workers. To best nurture the retention, attraction and growth of these industries, Maryland must compete and attain "first mover" advantage in developing a wide-range of transformative technologies reshaping our global economy—technologies such as cyber security, life sciences, AI, quantum computing, robotics, medical devices and clean energy. To further ensure the state's economic competitiveness, it must foster strategic public/private partnerships— thus creating a nexus where industry innovation and academic research competencies combine to drive advanced industry growth, and state and local economic development accordingly.

Key elements of any transformative, public/private strategy must:

- Advance strategic university and industry collaborations
- Incent place-making and/or innovation "ecosystem" development to retain/attract talent, foster collaboration and enable concentration of innovation-led activity near federal labs and education/research institutions
- Address STEM talent and workforce needs through multi-institutional, industry inspired and endorsed approaches
- Attract and leverage significant, long-term private investment



USM Competitiveness – Strategic Suggestions

1. **Marketing:** More aggressive promotion of our strengths to target industry executives and major employers in the Capital Region.
2. **Expand High-Demand Curriculum and Innovative Workforce Development Programs:** Focus on growing regional workforce and innovation economy by supporting existing and emerging talent needs. Stress need for talent retention while incentivizing new credit- and non-credit based degrees, as well as alternative certifications/credentials that provide new pathways into careers.
 - a. invest in “high-demand” curriculum and offer additional resources to Kirwan Center to scale deployment/distribution of programming;
 - b. invest more resources in MD Tech Internship Program to place and retain student talent;
 - c. consider investing resources in UMBC training centers to advance upskilling efforts and create new enrollment opportunities
 - d. support K-12 programming – entertain and help develop educational solutions utilizing experiential education and apprenticeship models.
3. **Grow Current Sponsored Research Activity and Encourage Industry Partnerships:** 65% of U.S. R&D is industry funded. Applied R&D and enhanced tech transfer activity critical to retain/attract top talent and new venture development growth.
 - a. enhance IP /commercialization policies and tech transfer staffing
 - b. work with federal partners to identify and foster industry engagement
 - c. grow number of corporate sponsored innovation centers/accelerators
 - d. provide grants/incentives to encourage industry collaboration (MTech’s Maryland Industrial Partnership MIPS program recognized as national “best practice” by Brookings)
4. **Provide More Capital Incentives:** Invest in innovation infrastructure and nurture/attract top talent by establishing *Maryland Technology/Innovation Infrastructure Fund* (MTIF) and building on initial success of initiatives focused on entrepreneurship and tech commercialization including:
 - a. MD Technology Internship Program (MTIP)
 - b. MD E-nnovation grants
 - c. SBIR/STTR matching grants
 - d. MD Innovation Initiative (MII)
 - e. MD industrial Partnerships (MIPs)
 - f. USM Momentum Fund
 - g. RISE Zone Amendment
5. **Utilize Strategic Location & Power of Place:** Invest in place-making efforts and expansion of research parks to leverage proximity to talent and research assets. Employ best practices to offer services, amenities and innovation supportive “ecosystem” or lifestyle community.
 - a. Engage USM stakeholders to advocate for amendment of the Regional Institution Strategic Enterprise (RISE) Zone to support startups and small business retention/growth
 - b. Enhance state and local jurisdictions’ efforts to foster new investment/re-investment around key anchor institutions within federally designated Opportunity Zones.



BOARD OF REGENTS

SUMMARY OF ITEM FOR INFORMATION

TOPIC: Greater Washington Partnership – Capital CoLAB Project

COMMITTEE: Economic Development and Technology Commercialization

DATE OF COMMITTEE MEETING: Tuesday, November 19, 2019

SUMMARY: The Greater Washington Partnership (GWP) is a first-of-its-kind civic alliance committed to making the Capital Region one of the world’s best places to live, work, and build a business. GWP seeks to increase access and diversity, retain talent, and elevate the region as an innovation hub. The GWP’s Capital CoLAB initiative is working with a selected set of university partners between Richmond, VA and Baltimore, MD to create robust opportunities for individuals to acquire in-demand digital skills credentials, to diversify the digital workforce through intentional talent identification and development of students from both STEM and non-STEM programs, and to scale educational opportunities to meet the region’s significant need for digital technology workers. However, realizing the GWP’s ambitious goals will require reaching more students than just those who attend the institutions that are part of the existing CoLAB university-business partnership.

As a member of the Capital CoLAB, the USM’s Kirwan Center will greatly expand and diversify the digital technology talent pool that GWP seeks by coordinating a system-wide effort to support institutions in mapping existing curricula to the GWP’s industry-identified list of knowledge, skills, and abilities (KSAs); developing a library of shared online instructional modules to fill gaps; consistently and rigorously assessing students’ acquisition of these skills; and making graduates’ expertise in these areas more transparent to employers through digital badges.

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

FISCAL IMPACT: There is no fiscal impact

CHANCELLOR’S RECOMMENDATION: n/a

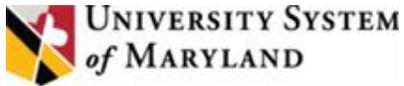
COMMITTEE RECOMMENDATION:

DATE:

BOARD ACTION:

DATE:

SUBMITTED BY: Tom Sadowski (410) 576-5742



BOARD OF REGENTS

**SUMMARY OF ITEM FOR
INFORMATION**

TOPIC: Partnering with Industry to Drive Innovation

COMMITTEE: Economic Development and Technology Commercialization

DATE OF COMMITTEE MEETING: Tuesday, November 19, 2019

SUMMARY: The USM has made the enhancement of industry sponsored research and partnership a strategic priority. Julie Lenzer, Chief Innovation Officer, and John Paul Sawyer, Director of Strategic Research Initiatives at the University of Maryland, College Park, will present the University's perspective on partnerships with industry – what's happening now, what needs to change, what is changing, and what lessons have been learned so far through UMCP's recent efforts to holistically engage with industry. Julie and John Paul have also provided a one-pager describing their options for IP licensing available to industry sponsors of research.

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

FISCAL IMPACT: There is no fiscal impact

CHANCELLOR'S RECOMMENDATION: n/a

COMMITTEE RECOMMENDATION:

DATE:

BOARD ACTION:

DATE:

SUBMITTED BY: Tom Sadowski (410) 576-5742



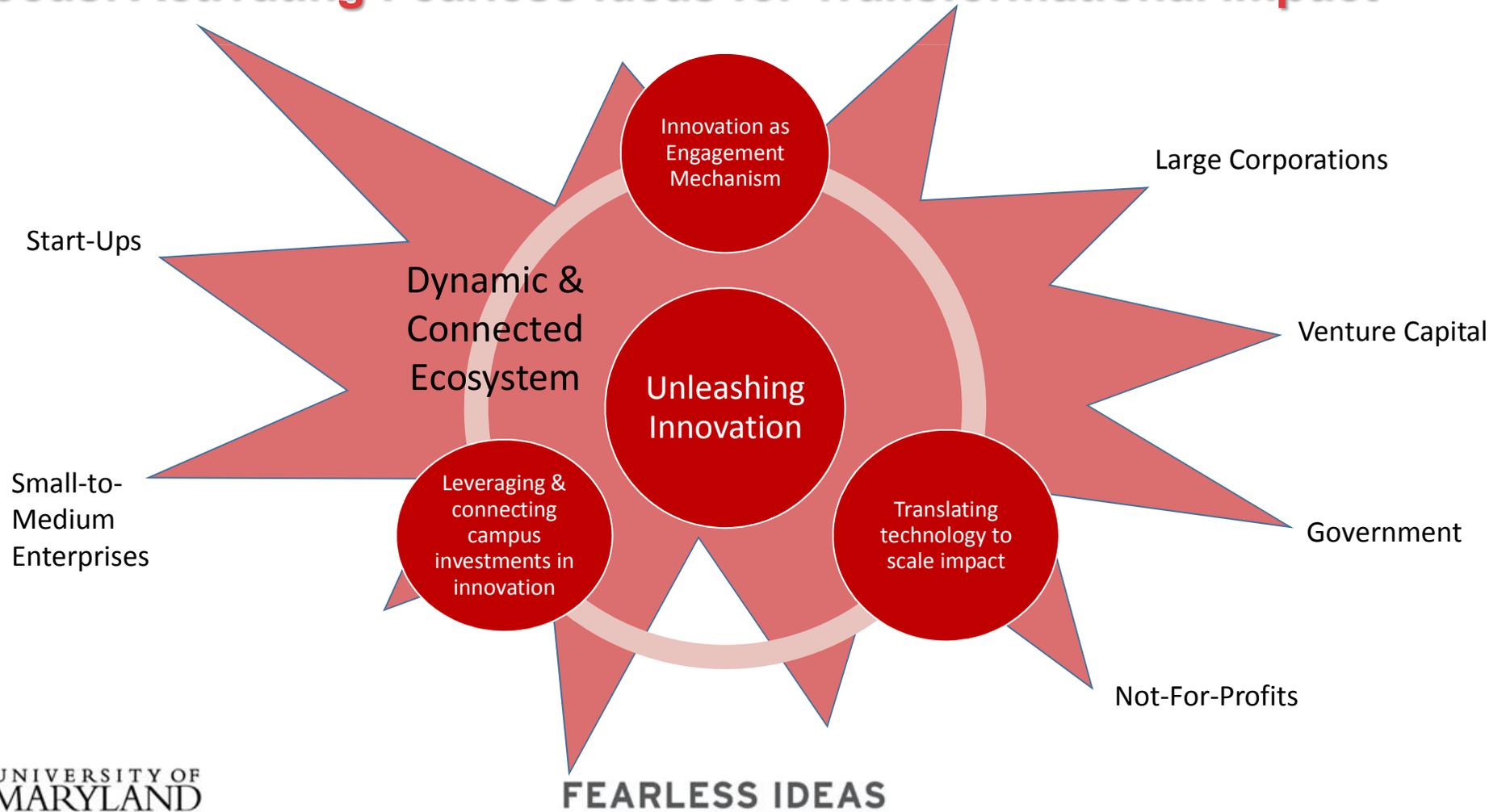
Partnering with Industry to Drive Innovation

Julie Lenzer, Chief Innovation Officer
John Sawyer, Director of Strategic Research Initiatives



UNIVERSITY OF
MARYLAND

Focus: Activating Fearless Ideas for Transformational Impact



Changing landscape driving need for transformation

Need to diversify research funding sources

Companies are asking for reduced friction, complexity, and risk in engagement and licensing

Hot technology areas (*AI, machine learning, data science*) contributing to workforce and faculty talent crisis

Young faculty, students value applied research and experiential learning

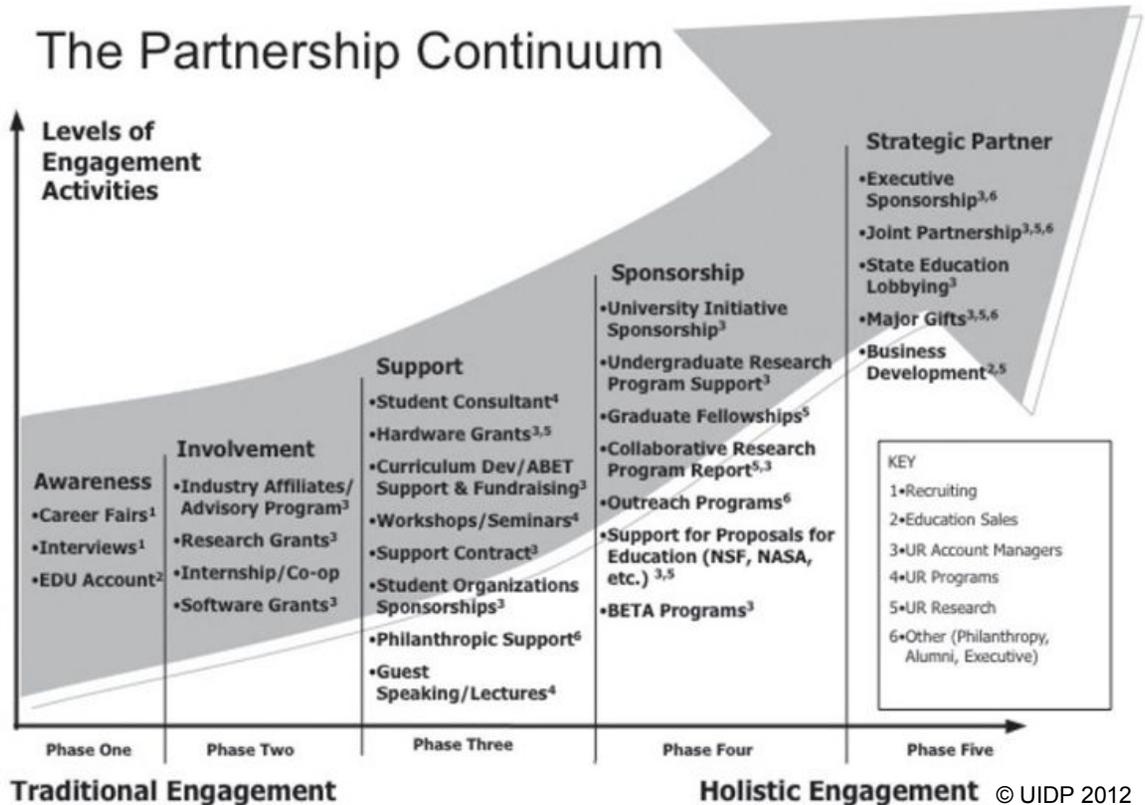
Partnership Continuum

Engagement depends on company's goals...

- Talent recruitment
- Thought leadership / branding
- Access to cutting-edge, differentiating technologies
- Creative solutions to business challenges
- Business development

... and happens at many levels

- Researcher
- Department / Center
- College
- University



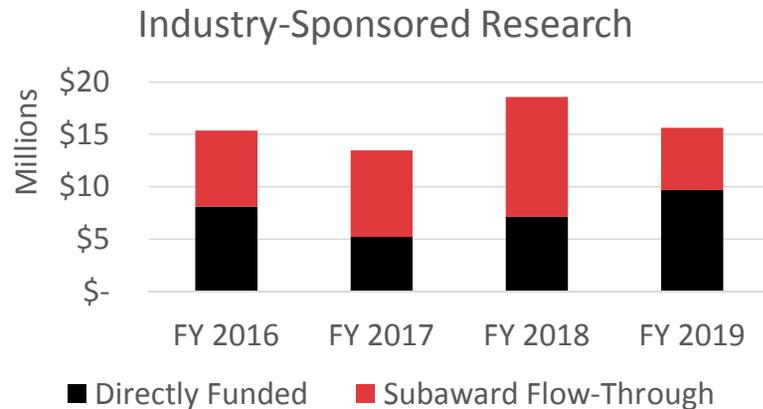
FEARLESS IDEAS



Snapshot of UMD industry-sponsored research

\$15-19M from industry per year

- ~3% of total research revenue
- 263 Sponsors
 - Average Spending/Year: \$125K
 - Median Spending/Year: \$53K



Top 15 Corporate Sponsors:

- **Lockheed Martin**
- Trinity Rail Group
- Boeing[†]
- Alcyon Technology Services
- **Northrop Grumman[†]**
- BAE
- **Facebook**
- Google
- INRIX
- Mars
- General Electric
- **Carrier**
- Booz Allen[†]
- Signature Science
- **Capital One**

Industry Engagement Standard Tracks



Students & Branding – opening the door

- Recruitment is often top priority, so lots of options already...
 - Corporate Partners Programs
 - Career fairs & recruitment events
 - Internships & co-ops
 - Showcases & tours
 - Targeted engagement
 - QUEST
 - Capstones
 - Sponsored Research
 - Major Gifts



Sponsored Research – making it easier

Standard IP Options

- A. Licenses negotiated after IP declared
- B. Upfront license granted for 10%/\$10k
- C. Upfront exclusive license granted for 15%/\$20k (with bonanza clause)



Driving towards master agreements

- A. Universal NDAs
- B. Master Research Agreements
- C. Master Teaming Agreements

Licensing Intellectual Property – changing the mindset

- Generally largest friction point with industry
- Transactions → Relationships
- Upfront transparency (term sheets)
- Under-resourced offices are an impediment

Goal: Operate at the speed of business



Discovery District – bringing us together

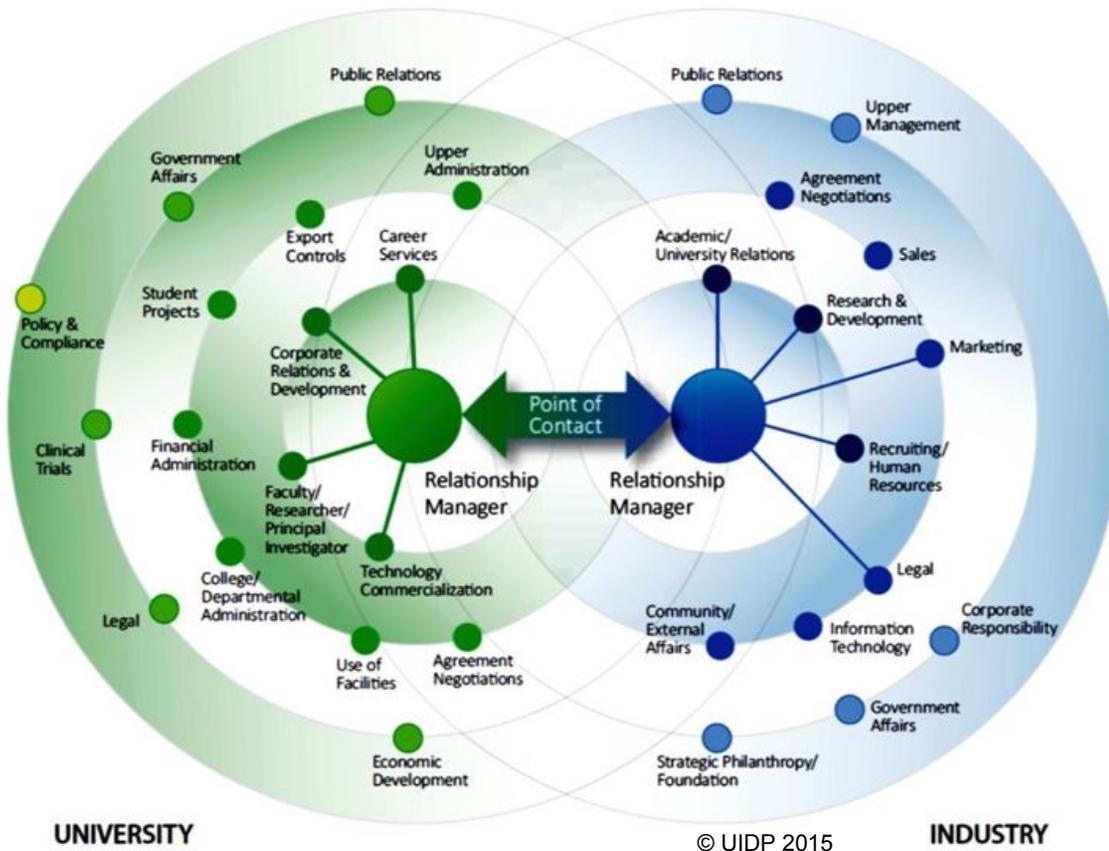
- Transitioning office park to research park (with TDC)
- Encouraging industry partners to physically co-locate to increase tempo of creative collisions



Holistic Management Lessons-Learned



Pilot: Holistic Approach to Strategic Partnership



Emphasis on research, workforce development & strategic positioning

Expectations:

- Collaboration with 2+ colleges
- 2+ Sponsored projects/year
- ~\$1M in giving/sponsored research

Successful Pilot → Task Force

Structuring for Success

Focus on Master Agreement

- Fast & easy project initiation, e.g. ~1 week from initial inquiry to contract
- A reputation for speed/ease drives follow-on growth

Holistic Relationship Management

- Dedicated leads on both sides to maintain inertia, create opportunities & troubleshoot issues
- Senior leadership buy-in ensures visibility and resourcing



Feeding the Relationship

Convene technical experts on high-impact topics

- Access real-world challenges
- Demonstrate thought-leadership
- ID potential collaboration areas
- Build real relationships



Joint workshops with mutual partners / customers

- Demonstrate value of partnership
- Deeper insights into opportunities
- Ability to shape engagement
- Empower partner to pay for time & travel



Cluster-Focused Engagement

Mixed, Augmented, Virtual Reality Innovation Center (MAVRIC)

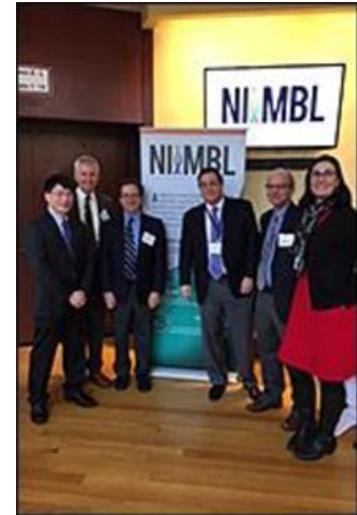
Maryland Energy Innovation Initiative (MEI²)

Maryland Quantum Alliance (MQA)

Participation in Manufacturing USA Institutes:

- NIIMBL: National Institute for Innovation in Manufacturing Biopharmaceuticals
- ARM: Advanced Robotics for Manufacturing
- NextFlex (Flexible, Hybrid Electronics)
- America Makes (Additive Manufacturing)

Smart Cities Roundtable



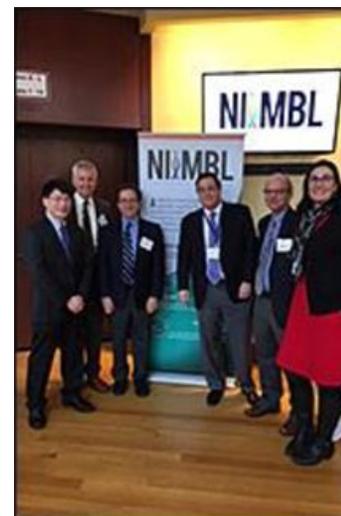
Cluster-Focused Engagement

Benefits

- Often cross-disciplinary
- Builds relationships with companies
- Insight into real-world challenges
- Raises profile of UMD in the sector

Challenges

- Requires resources to manage (people, cost-share)
- Faculty buy-in is key, but culture issues abound
- Sustainable funding



Opportunity and Challenge: Dual Employment



Strong demand from Industry to directly employ faculty

- Trusted access to sensitive data & challenge problems
- Own IP generated on company's applied projects
- Prefer to keep faculty at university to teach, mentor and innovate

Need to manage ethics, COI, liability, etc.

USM Assistance



Expanding impact

Provide access to competitive intelligence tools/products

- Identify & track research strengths, connections and collaborative opportunities between universities & corporations

Marketing: Help tell the world that UMD is Open for Business

Assist with regional workforce development programs through MFG Institutes

- Coordinate WF programs at 2- and 4-year institutions in state
- Advocate for & streamline processes for state matching resources

Continue tracking & managing private use risk

- Enables upfront licensing, which is a critical tool for attracting industry & building relationships



IP Licenses for Corporate Sponsored Research

The University of Maryland offers 3 simplified licensing models available to industry sponsors, providing a streamlined path to commercialization for intellectual property arising from sponsored research.

A

Standard

Negotiated license at project completion

- Sponsor & University negotiate a royalty-bearing license once IP is developed
- Requires commercialization diligence and reporting
- 6-month** exclusive option to negotiate a commercial-use license

B

Prepaid Non-Exclusive

Non-exclusive, worldwide license with the following terms

- Pre-pay **10%** of sponsored research agreement or **\$10K**, whichever is greater¹
- No royalties, annual minimums, or other fees
- Sponsor pays all patent costs
- No diligence, milestones or reporting
- Not sublicensable
- Not available for research awards or other types of non-commercial sponsors for public service.
- 6-month** exclusive option to negotiate an exclusive royalty-bearing license

C

Prepaid Exclusive

Exclusive, worldwide license with the following terms

- Pre-pay **15%** of sponsored research agreement or **\$20K**, whichever is greater¹
- Sponsor pays **1%** royalties on net sales when annual sales exceed **\$20M**; no annual minimums
- Sponsor pays all patent costs
- No diligence, milestones or reporting
- Sublicensable
- Not available for research awards or other types of non-commercial sponsors for public service.

FOOTNOTES

1 This fee is calculated based on the entire project budget including standard University overhead that must be paid at the appropriate research F&A rate.