



BioHealth InnovationSM
Maryland's Commercialization Collaborative

Corporate Connect Council BHI Introduction

Rich Bendis

President & CEO

BioHealth Innovation, Inc.

UMCP Riggs Alumni Center

5/13/2015

BHI/USM Partnership



- Brit Kirwan is a founding board member of BHI
- Ken Malone: USM Entrepreneur-in-Residence
- USM/BHI Portfolio companies
 - **3DBioWorks (UMB)** – Grows cord stem cells in 3D printed bioreactors.
 - **Tertius Analytics (UMCP)** - Provides analytical tools for network modeling of regional industry clusters.
 - **Asulon Therapeutics (UMD)** - Developing small molecule therapeutics for rapid acting anti-depressants.
 - **Paradigm Shift (UMB)** – Developing small molecule therapeutics to support counter-terrorism and radiation oncology products
 - **N5 Sensors (UMCP)** – Multiple SBIR award winner
- IBBR Memorandum of Understanding (MOU)
- BHI is a Celebration of Innovation and Partnerships sponsor

The Region – Central Maryland

- Unrivaled Research Assets -
- Unfulfilled Commercial Promise -
- 550+ BioHealth Companies -



National Institutes
of Health



State of Maryland: Federal & University Resources



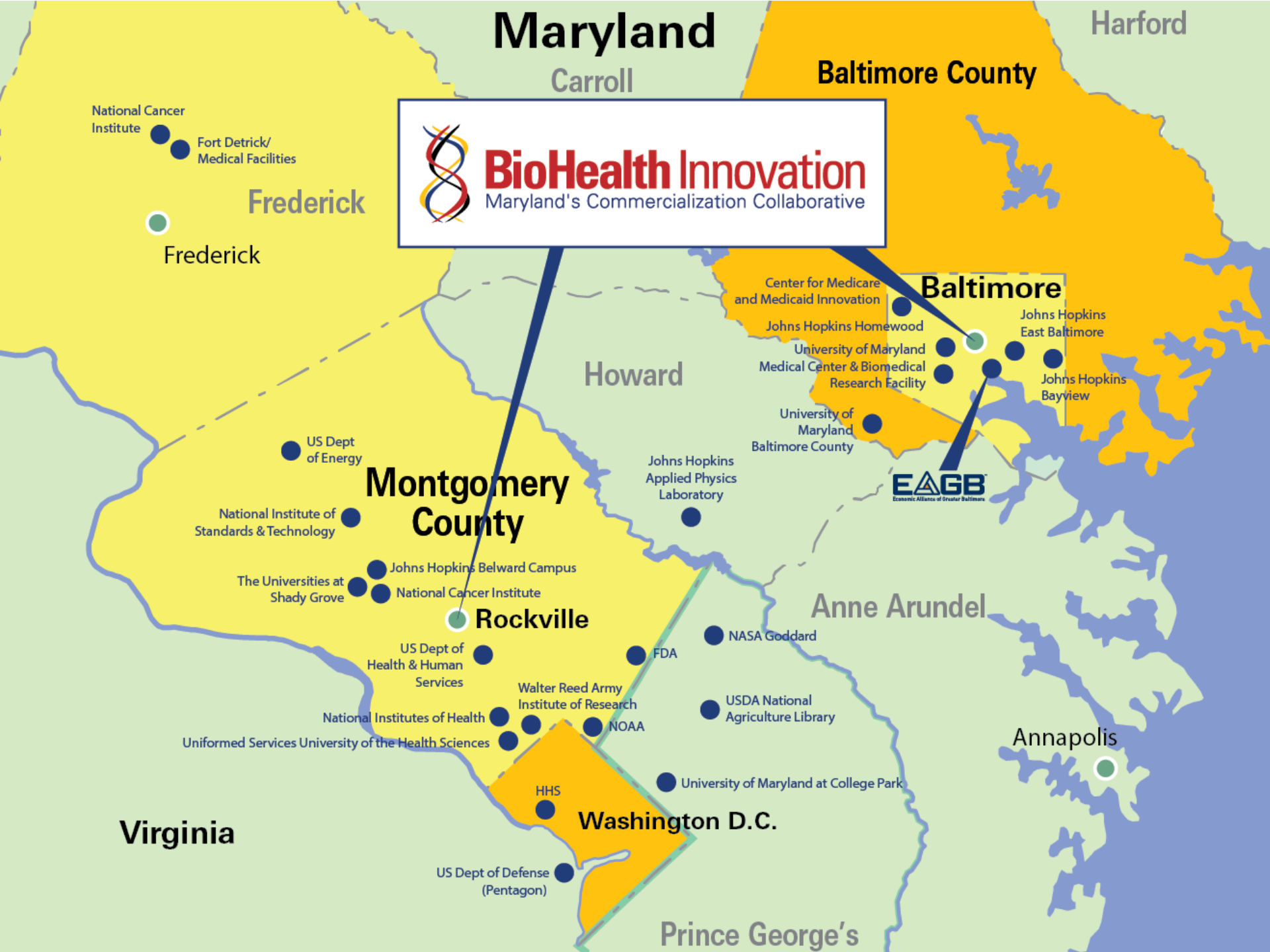
- **Population: 5.9 million people**
- **59 Federal Laboratories, Centers, & Institutes in Maryland**
- **Maryland Federal R&D investment exceeding \$12 billion annually**

JHU and USM represent another \$3.5 billion in annual R&D



JOHNS HOPKINS
UNIVERSITY





BioHealth Innovation
Maryland's Commercialization Collaborative

Baltimore

- Center for Medicare and Medicaid Innovation
- Johns Hopkins Homewood
- University of Maryland Medical Center & Biomedical Research Facility
- Johns Hopkins East Baltimore
- Johns Hopkins Bayview
- University of Maryland Baltimore County



Montgomery County

- US Dept of Energy
- National Institute of Standards & Technology
- The Universities at Shady Grove
- Johns Hopkins Belward Campus
- National Cancer Institute
- US Dept of Health & Human Services
- National Institutes of Health
- Uniformed Services University of the Health Sciences

Rockville

Washington D.C.

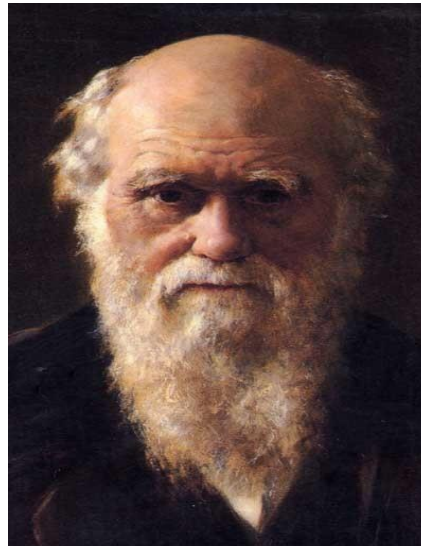
- Johns Hopkins Applied Physics Laboratory
- NASA Goddard
- FDA
- USDA National Agriculture Library
- Walter Reed Army Institute of Research
- NOAA
- HHS
- University of Maryland at College Park
- US Dept of Defense (Pentagon)

Virginia

Change is Inevitable

“ It is not the strongest of species that survive, nor the most intelligent, but the ones most responsive to change.”

-Charles Darwin



Implementing a new Innovation Paradigm

- Willingness to deviate from traditional and parochial perspectives
- Encourage public investment and risk taking
- Developing trust through collaboration
- Ensuring the paradigm is responsive to partners' missions
- Building consensus of all constituents through education, participation, and positive outcomes
- Move from technology-based economic development to
- **Innovation-Based Economic Development**

Challenges to Innovation Economy

Lack of connection of innovation
resources

Lack of an entrepreneurial culture
and C-level executives

Lack of early-stage funding for
commercializing technologies

Lack of spin-offs from federal and
university R&D

BHI Value Proposition

Connect regional innovation
assets

Develop an entrepreneurial talent
and support pipeline

Attract funding for technology
commercialization

Evaluate commercially relevant
federal and university technology

BioHealth Regional Innovation Cluster Assets



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NEA
New Enterprise Associates*

MARYLAND OF OPPORTUNITY. SM



APL
The Johns Hopkins University
APPLIED PHYSICS LABORATORY



NATIONAL
CANCER
INSTITUTE

BIO X MARYLAND

MaBio



National Biodefense Analysis
and Countermeasures Center



J. Craig Venter
INSTITUTE



Bio
BIOTECHNOLOGY
INDUSTRY ORGANIZATION

BioHealth Innovation is an Innovation Intermediary

An private-public partnership, serving as an innovation intermediary in Central Maryland with a mission to:

- Advance local technologies, assets and resources
- Accelerate innovation
- Globally connect sectors, industries, communities, and markets



- Regionally-oriented
- Private-public partnership, 501(c)(3) nonprofit
- Market-driven, private sector-led and funded
- Neither a government initiative, nor a membership organization

Public Private Partnership Best Practices, Common Attributes

- Longevity
- Bipartisan Support & Champions
- Independent Organizations
- Continuous Reinvention
- Private Sector Involvement
- Understand Return On Investment
- Sustainability In Funding
- Accountable
- Innovative
- Effective Leadership

Regional BioHealth Ecosystem Partners



BHI Partners and Sponsors

Private Sector



Government















Academia



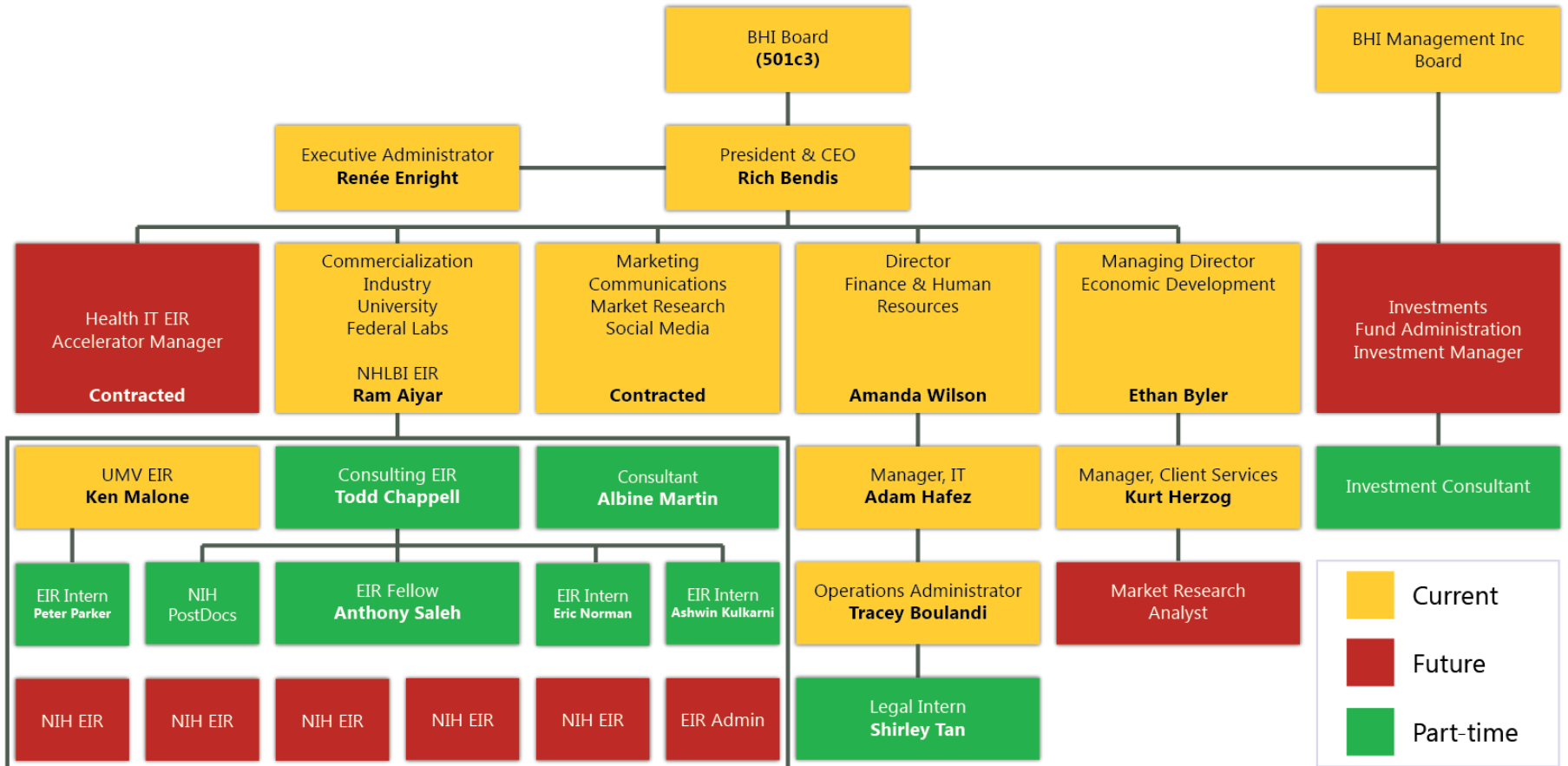
NGOs



BHI Board of Directors

 <p>Daniel J. Abdun-Nabi CEO, Emergent BioSolutions</p>	 <p>Judith Dunn VP, Global Head of Clinical Dev. Roche</p>	 <p>Douglas Liu Senior VP of GO Qiagen</p>
 <p>Michael J. Baader, Esq. General Counsel Greenspring Associates</p>	 <p>Jens Eckstein President SR One (GSK)</p>	 <p>Charles Morton Partner Venable LLP</p>
 <p>Richard A. Bendis President & CEO BioHealth Innovation, Inc.</p>	 <p>David M. Gillece (Secretary) Regional Managing Principal Cassidy Turley</p>	 <p>David Mott General Partner New Enterprise Associates</p>
 <p>Kenneth Carter Chair Noble Life Sciences</p>	 <p>Rick Ivey Vice President R&D BD Diagnostics</p>	 <p>John A. Sackett President Shady Grove Adventist Hospital</p>
 <p>Dave Lemus CEO Sigma-Tau Pharmaceuticals</p>	 <p>Joel Marcus CEO & Founder Alexandria Real Estate</p>	 <p>J. Thomas Sadowski President & CEO EAGB</p>
 <p>Chris Callaghan Group VP, Healthcare Banking M&T Bank</p>	 <p>Beth Meagher Principal Deloitte Consulting LLP</p>	 <p>Reginald Seeto VP, Partnering and Strategy MedImmune</p>
 <p>Ronald J. Daniels President Johns Hopkins University</p>	 <p>William E. Kirwan Chancellor University System of MD</p>	 <p>Thomas Street ACAO MoCo Government</p>

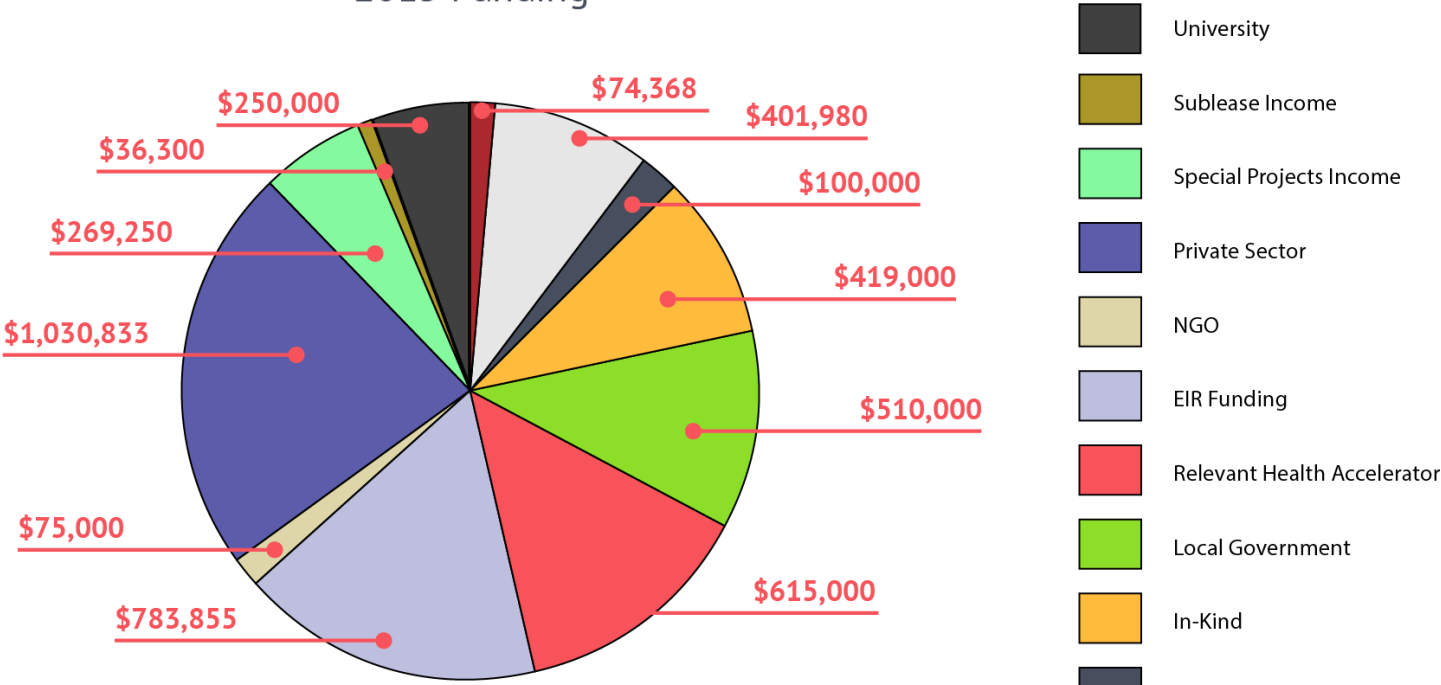
BHI Organizational Chart



PROJECTED FUNDING

\$4,565,585

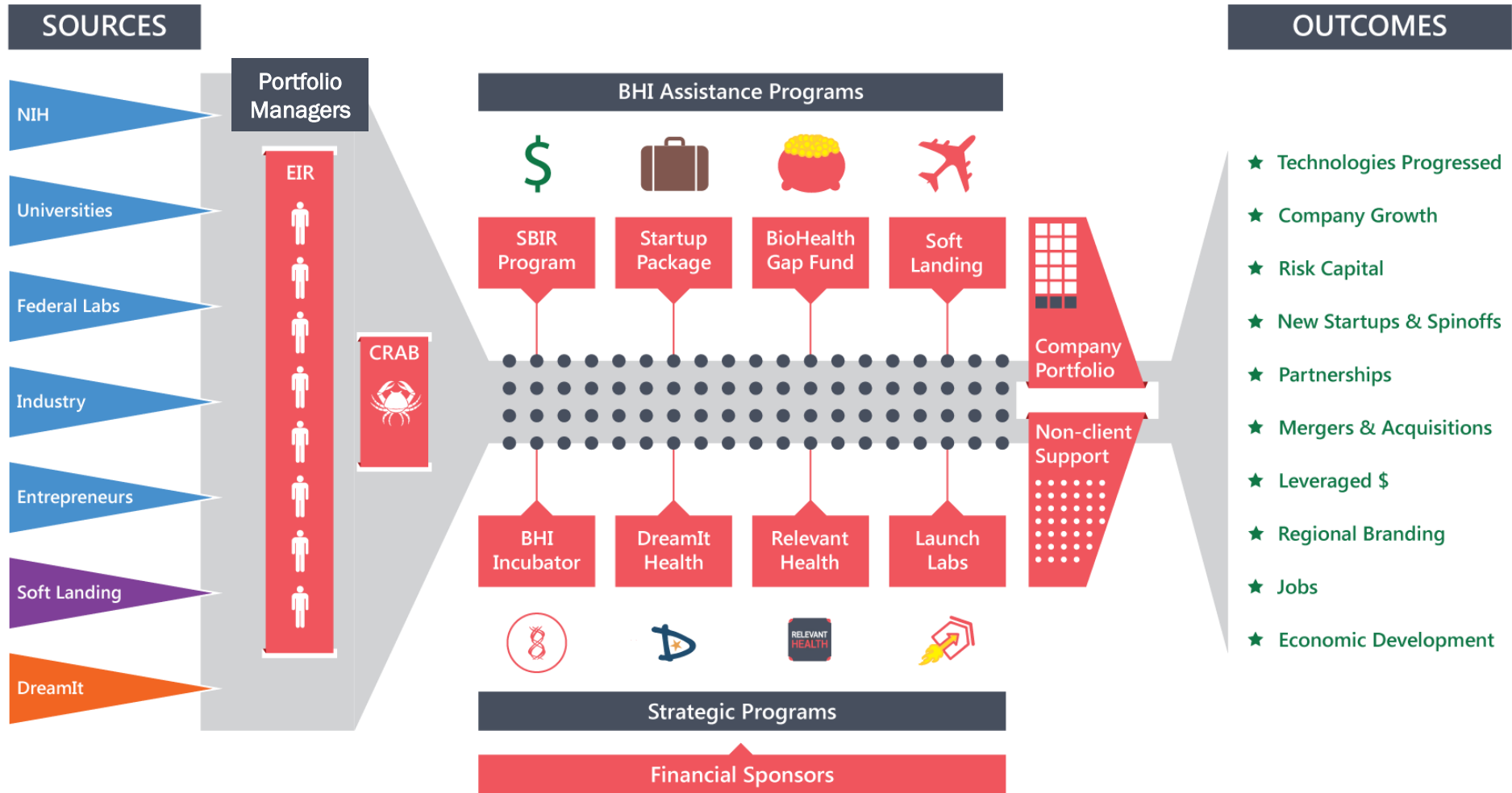
2015 Funding



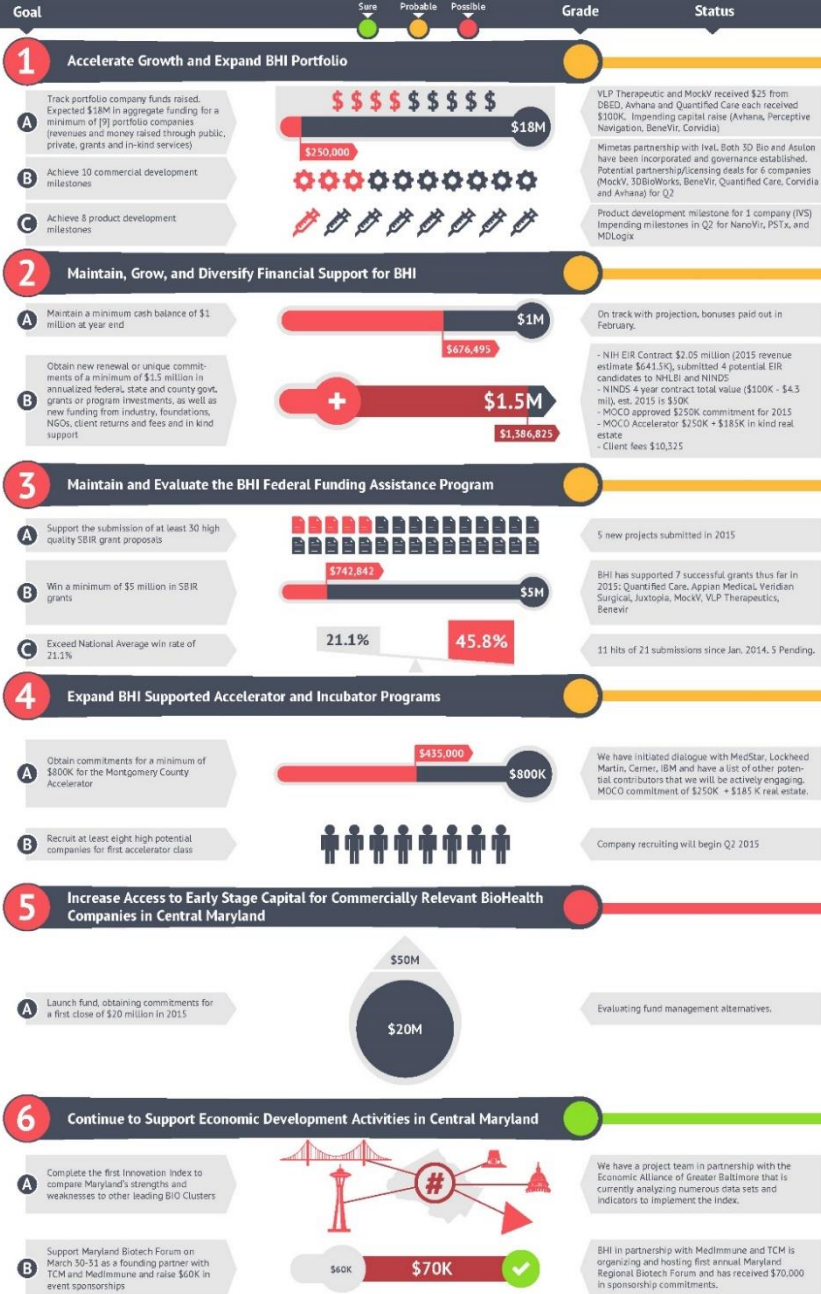
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Leverage Ratio to each County \$

BHI Program Structure

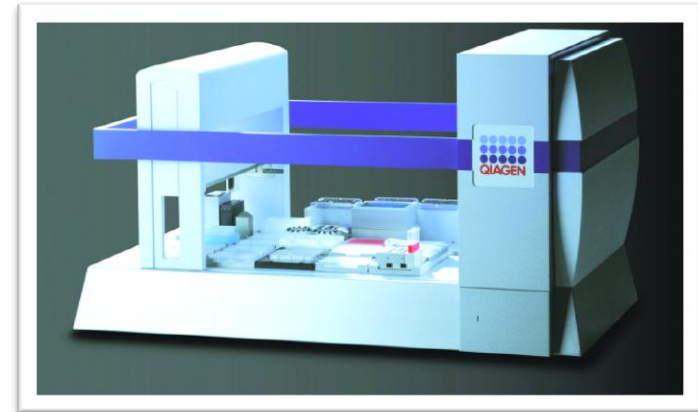
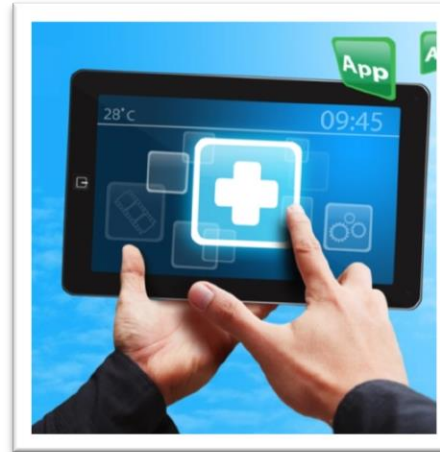


2015 Metrics Dashboard



BHI Technology Focus

- Therapeutics
- Diagnostics
- Medical Devices
- Healthcare Services
- E-Health
- Mobile Health
- Electronic Medical Records
- Health Informatics
- BioHealth Cyber Security

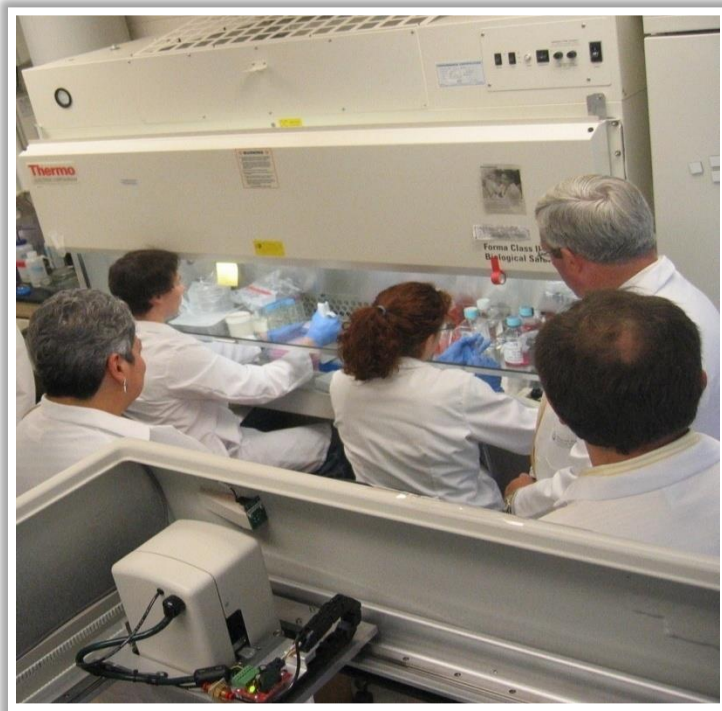


Innovation Paradigm Shift

PROOF OF CONCEPT
(Technological Feasibility)

Laboratory Push

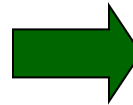
“It Works!”



PROOF OF COMMERCIAL RELEVANCE
(Market Pull)

“It Works To Solve A Problem”

“I’ll Buy It”

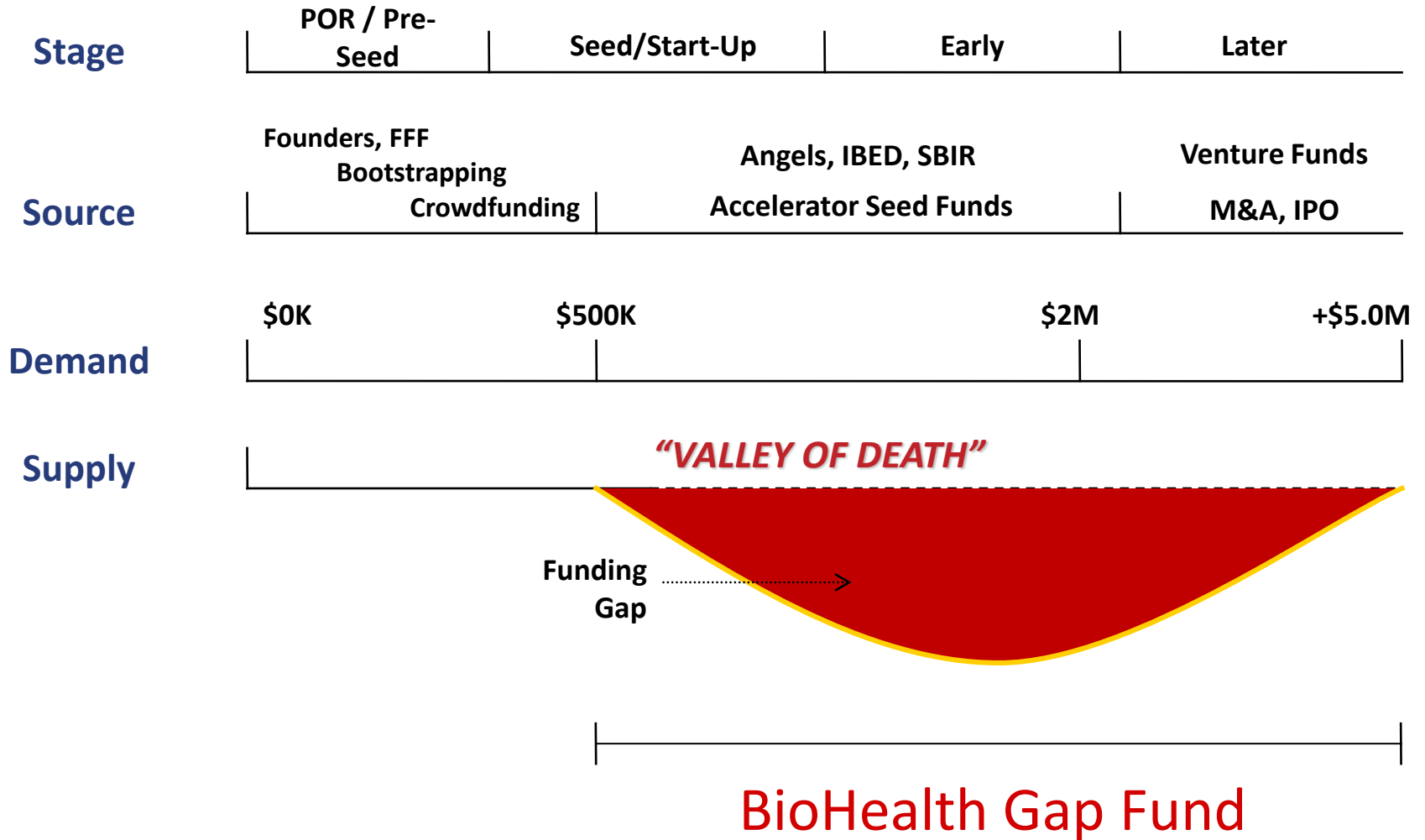


BHI Commercial Relevance Advisory Board



- A pool of experienced biohealth professionals who have agreed to assist BHI in evaluating market-relevant research and product development opportunities
- The CRAB helps determine the commercial applicability of emerging entrepreneurs, companies and their science or technology.

Innovation Capital **Valley of Death**



BHI Innovation Capital Map



Capital Sources by Investment Stage

Pre-Proof of Concept \$25,000 - \$1,500,000 (over 5 yrs)	Translational Research/ Proof of Concept \$15,000 - \$750,000 (over 3 yrs)	Proof of Commercial Relevance/Pre-Seed \$15,000 - \$500,000	Seed/ Start-Up \$50,000 - \$1,500,000	Early Stage \$200,000 - \$2,500,000	Later Stage \$2,500,000+
<ul style="list-style-type: none"> NIH R01 NIH R03 NIH R21 	<ul style="list-style-type: none"> SBIR/STTR Grant Phase 1 NCATS Cures Acceleration Network (CAN) Maryland Stem Cell Research Fund (MSCRF) - Various TEDCO Technology Validation Program - Proof of Concept TEDCO Maryland Innovation Initiative - Phase 1 JHU - Coulter Translational Research Partnership 	<ul style="list-style-type: none"> Maryland Industrial Partnerships (MIPS @ UMD) TEDCO Maryland Innovation Initiative - Phase 2 Maryland Stem Cell Research Fund (MSCRF) - Pre-Clinical TEDCO Technology Validation Program - Market Assessment SBIR/STTR Phase 2 ★ SBIR/STTR Federal Funding Assistance Program 	<ul style="list-style-type: none"> Dingman Center Angels (UMD) BioMaryland Biotechnology Dev. Award - Translational Research TEDCO Patent Assistance Program TEDCO Technology Commercialization Fund TEDCO Maryland Innovation Initiative - Phase 3 SBIR/STTR Phase 2 ★ BioHealth Gap Fund 	<ul style="list-style-type: none"> Propel Baltimore Fund TEDCO Veterans' Opportunity Fund Invest Maryland: Maryland Venture Fund BioMaryland Biotechnology Dev. Award - Commercialization Maryland Health Care Product Development Corporation Abell Venture Fund MMG Ventures LLP TDF ★ BioHealth Gap Fund 	<ul style="list-style-type: none"> Maryland Venture Fund Authority ABS Capital Partners Greenspring Associates Novak Biddle Venture Partners Sterling Venture Partners Harbert Venture Partners JMI Equity New Enterprise Associates (NEA)

Funding Type Key

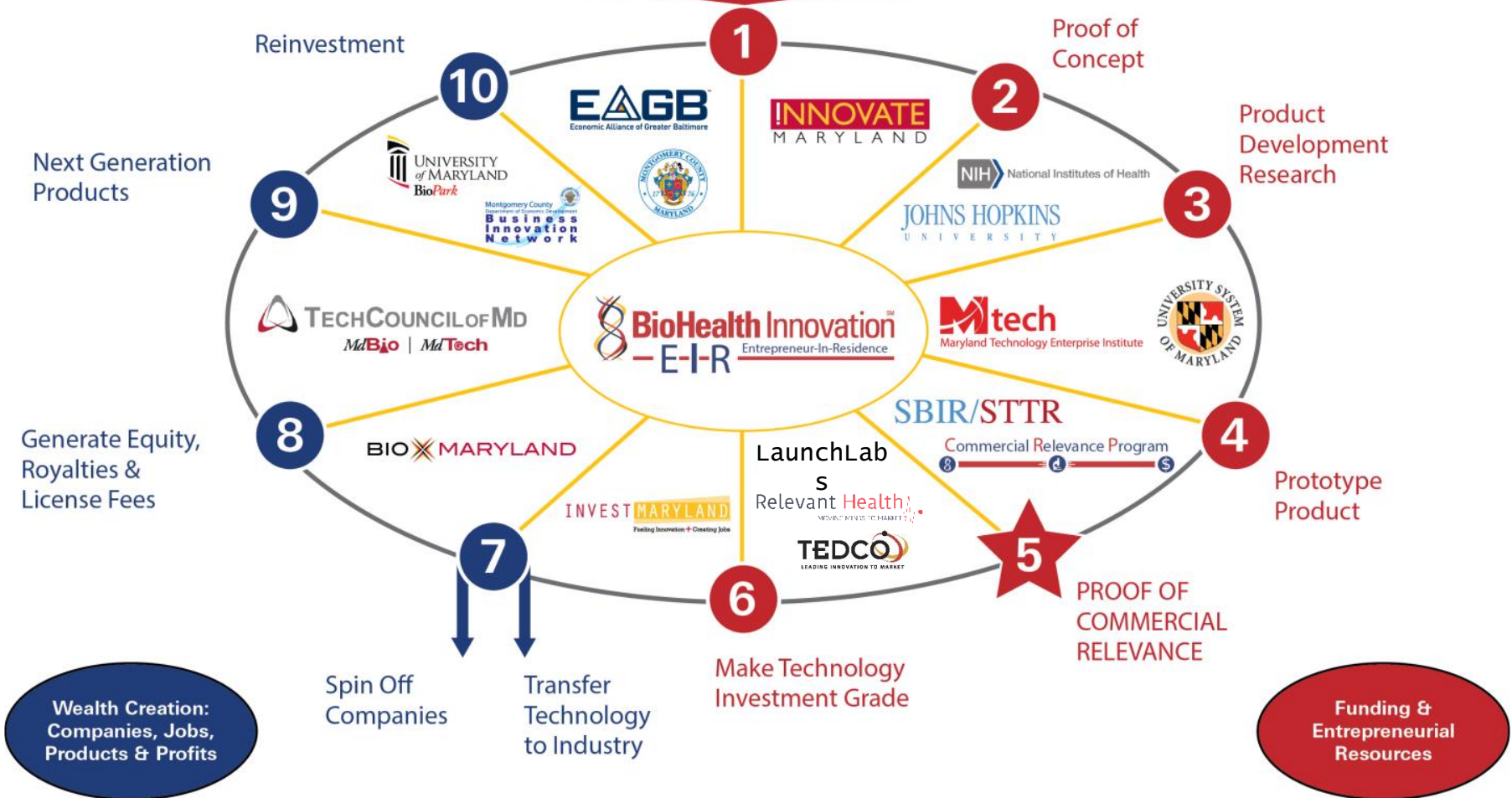
- Academic
- State of Maryland
- Federal
- BioHealth Innovation, Inc.
- Economic Development
- Private Capital

Tax Credits

- Maryland Biotechnology Investor Tax Credit
- Montgomery County Biotechnology Investor Tax Credit

BHI Commercialization Model

Inventions patented through Universities, Federal Labs, Private R&D, and Basic Research



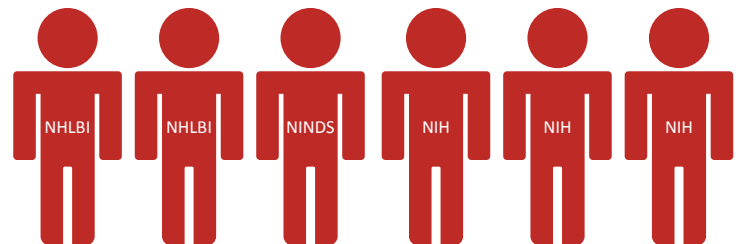
NIH Partnership Agreements



PIA between BHI and NIH's Office of Technology Transfer (OTT) that supports the 27 NIH institutes' \$3 billion intramural research and the Food and Drug Administration to **promote and foster cooperative research and accelerate technology commercialization** among NIH/FDA, businesses, and universities.



NIH Consulting Entrepreneur Services Contract for 5 NIH Entrepreneurs-in-Residence



Who are the Entrepreneurs-in-Residence?



Ram Aiyar (NHLBI)

Ram assists the National Heart Lung and Blood Institute (NHLBI) in translating disruptive science into commercially viable technologies. He works with the relevant stakeholders within the NIH to develop commercial plans and/or develop licensing opportunities such that the NIH technologies can be translated into commercially viable entities that will solve unmet medical needs of patients.



Ken Malone (UM Ventures)

Ken has built his career on creating economic value from science. Whether it was developing new business lines for global corporations or spinning out new ventures from universities, he has engaged in the commercialization of hundreds of new products in advanced materials and life sciences.



Todd Chappell (EIR Consultant)

Todd assists the Office of Technology Transfer (OTT) in the evaluation of existing technologies, provide an entrepreneurial perspective on new licensing proposals from start-up companies, advise on opportunities for new ventures, assist with developmental strategies, and mentor scientists to help ensure their research becomes commercially valuable.



Albine Martin (EIR Consultant)

Dr. Albine Martin brings over 20 years of product commercialization and corporate development experience with 3 public companies located in Maryland and representing the biotechnology, diagnostics and life sciences sector. She has also served as a member of Active Angels, Inc where she syndicated and provides diligence for early stage investments.


Pending:
5 new NIH
EIRs







BHI Company Portfolio – 31 Companies – 126 Jobs*





● Therapeutic
 ● Medical Device
 ● DreamIt Health
 ● Health IT / IT
 ● R&D Tool
 ● Occupational Safety and Health


 active immunotherapy against evolving tumors
Magnifygen

NanoVir, LLC
Asulon Pharma
Paradigm Shift


Intravenous Solutions


Avhanahealth
Aegle
 
 
Phobious
 live fearless


 


Baton **REDOX**


 Networks. Clusters. Regions.
mdlogix
 accelerating clinical research



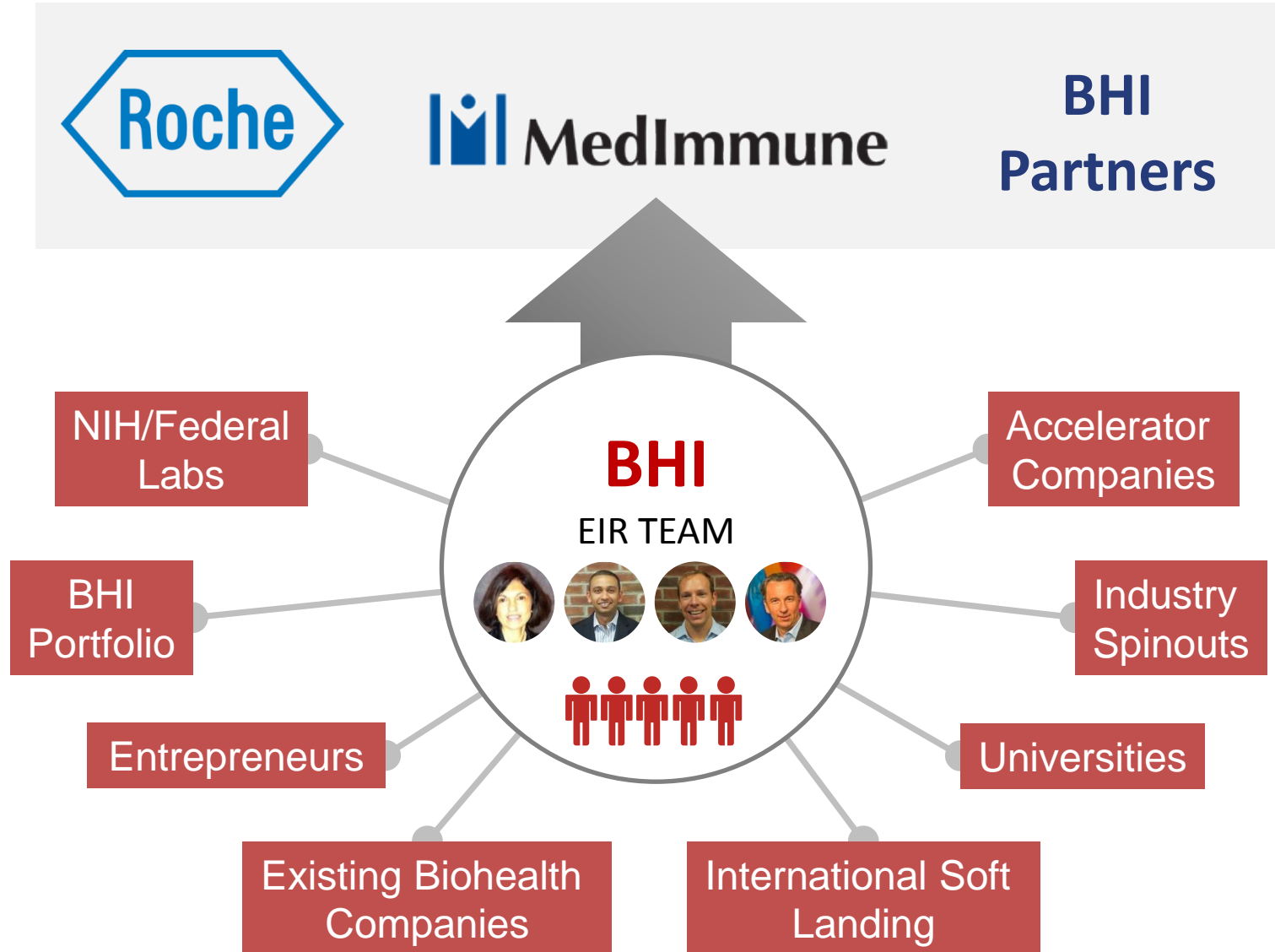

 the organ-on-a-chip company

3DBioWorks


 Smart Sensors for a Safer World

*Numbers do not reflect BHI employees, company consultants, and full-time equivalents at each of the portfolio companies.

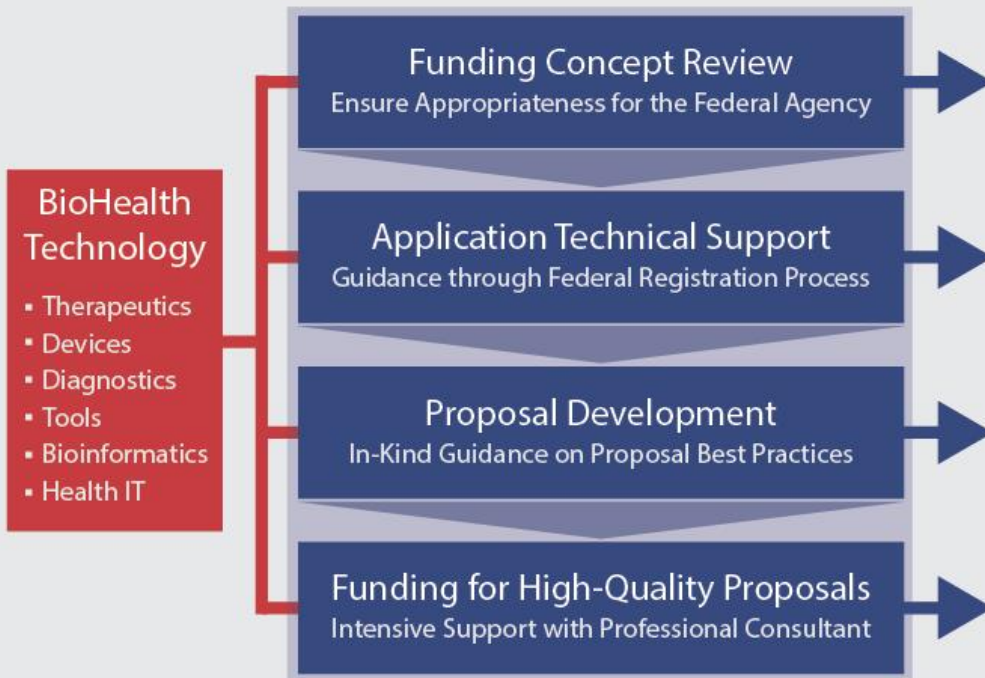
BHI Scouting



BHI Federal Funding Assistance

- \$2.2 billion annual United States Government program coordinated by the Small Business Administration provides grants or contracts to small businesses to spur technological innovation
- Grants awarded in 3 phases between \$100,000 and \$1.5 million
- Non-dilutive

Value Chain of Assistance



Funding Agencies



BHI Federal Funding Assistance

Running Total – Small Businesses Assisted

14 Awards won; \$2.25M in funding

25 Projects supported by BHI funds

126 Projects Reviewed

51 Grant Proposals Submitted

2015 Success Rate

45.8% vs **21.1%**
Program Success Rate National Average Win Rate

BHI Startup Package

Corporate Legal



Intellectual Property



Clinical Services



Accounting



Laboratory Space



Incubation



Banking



Payer Advisory Services



Scientific Data Management Services



Grant Consulting



BHI Incubator

BHI interacts with companies and technologies at various stages in the biohealth industry from the results of basic research to companies currently selling products in the market. At these multiple levels of maturity, BHI evaluates whether the organization can help progress the scientist, inventor, entrepreneur, and/or business manager to support the growth of the entity.

We have a dedicated co-working space at our headquarters in Rockville where we support client companies with the goal of progressing the business model for the company.

The BHI Incubator is a member of MBIA, NBIA, and is a certified Maryland TEDCO Incubator.



MockV
Solutions



Mimetas
US, Inc.

Alexandria LaunchLabs



FEATURES

- Five laboratory/office modules; each approximately 1,200 Rentable Square Feet (RSF)
- Laboratory space includes casework, sink, fume hood, equipment storage, emergency generator capacity, etc.
- Office space includes one furnished office, two workstations and common lobby, pantry, conference rooms, IT closet, autoclave, and glass wash so business can immediately commence

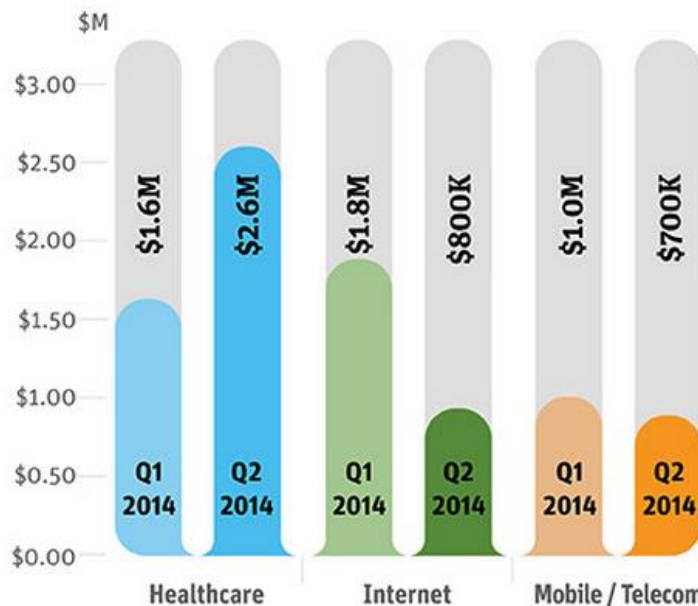
LEASE TERMS

- 12 month lease terms with potential for a six (6) month extension
- Base Rent is \$3,925 per month to account for rent and operating expenses inclusive of utilities
- Security deposit is equivalent to one (1) month of Base Rent

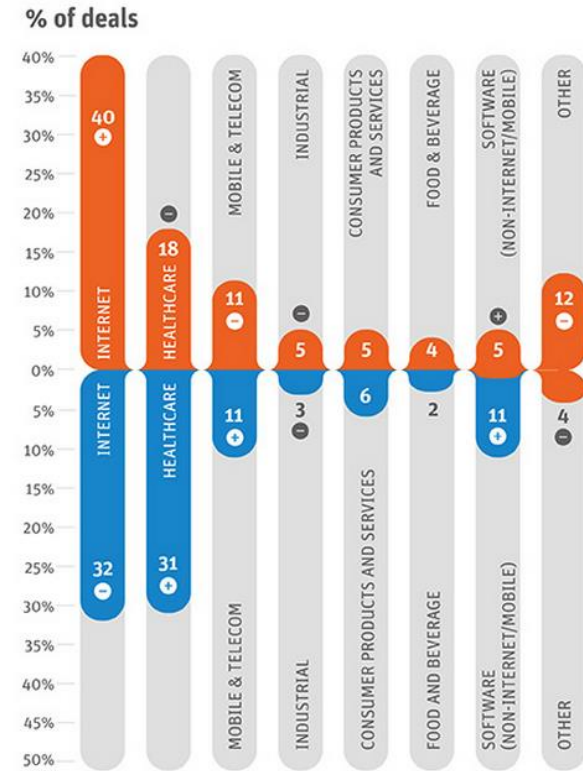
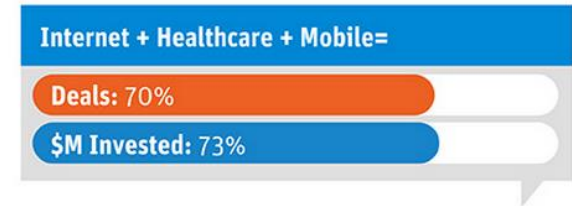


Health IT ... Booming

- Increased investments in the mobile and healthcare sectors helped boost the median size of angel and angel group syndicate rounds
- Mobile health technologies projected to be worth \$11.8 billion by 2018



* Median round size, including non-angel investors



\$M invested

⊕ Indicates an increase over Q1 2014
 ⊖ Indicates a decrease from Q1 2014



- A Health IT Accelerator is an intensive 16 week program that admits top-recruited companies and entrepreneurs, provides a curriculum and network of experienced mentors in business, marketing and product development in the Health IT arena to “accelerate” top companies.

- Retain promising high growth HIT entrepreneurs in MD


- **Partners:**

- ❖ BioHealth Innovation, Inc.
- ❖ Johns Hopkins University
- ❖ DreamIt Ventures
- ❖ Economic Alliance of Greater Baltimore
- ❖ Northrop Grumman
- ❖ Kaiser Permanente
- ❖ DBED
- ❖ The Abell Foundation








DreamIt 1

JHU
Affiliated

	● Wearable biometric devices	Baltimore, MD	
	● Practicing smarter medicine	Baltimore, MD	
	● Mobile Cognitive Rehabilitation	Talinn, Estonia	
	● Mobile Information Platform	Baltimore, MD	
	● Protecting Patient Data	Baltimore, MD	
	● Respiratory Medical Device	Athens, Greece	
	● Inpatient Care Collaboration	Pittsburgh, PA	
	● Augmented Reality Treatment	Barcelona, Spain	
	● Digital Workflow Management	Baltimore, MD	

DreamIt 2

Baton	● A mobile app designed to ensure more efficient patient handoffs between hospital teams.	Baltimore, MD
 Sisu Global Health	● Makes devices for the “most challenging” medical environments.	Grand Rapids, MI
 DECISIVE HEALTH	● A platform that helps practices	San Francisco
 InsightMedi	● A photosharing network for the healthcare industry	Spain
 RD Real Dietitian	● A telehealth platform focused on increased access to dietitians	Chicago, IL
 REDOX	● A modern API that enables software developers to integrate with legacy health IT systems.	Baltimore, MD

Relevant Health

MOVING MINDS TO MARKET

- Business accelerator for health startups in 2015
- 5 month formal co-working program with 7 month continuation
- Connect founders with a strong mentor network
- Help founders grow into a company ready for pilot testing and
- Cohorts of 8 - 10 companies and their founders recruited globally
- Up to \$50,000 in stipends per company
- Product focus
- Software developer pool
- Long term support/transition into Montgomery County Incubator Network
- Close proximity to NIH, FDA, HHS, Health companies, international trade representatives and BioHealth Innovation
- **Program Duration: September 2015 – February 2016**



Rockville Innovation Center

The logo features a stylized DNA double helix on the left, composed of two intertwined strands in red and blue. To the right of the helix, the text "BioHealth Gap Fund" is displayed in a bold, sans-serif font. "BioHealth" is in red, "Gap" is in blue, and "Fund" is in red.

BioHealth Gap Fund

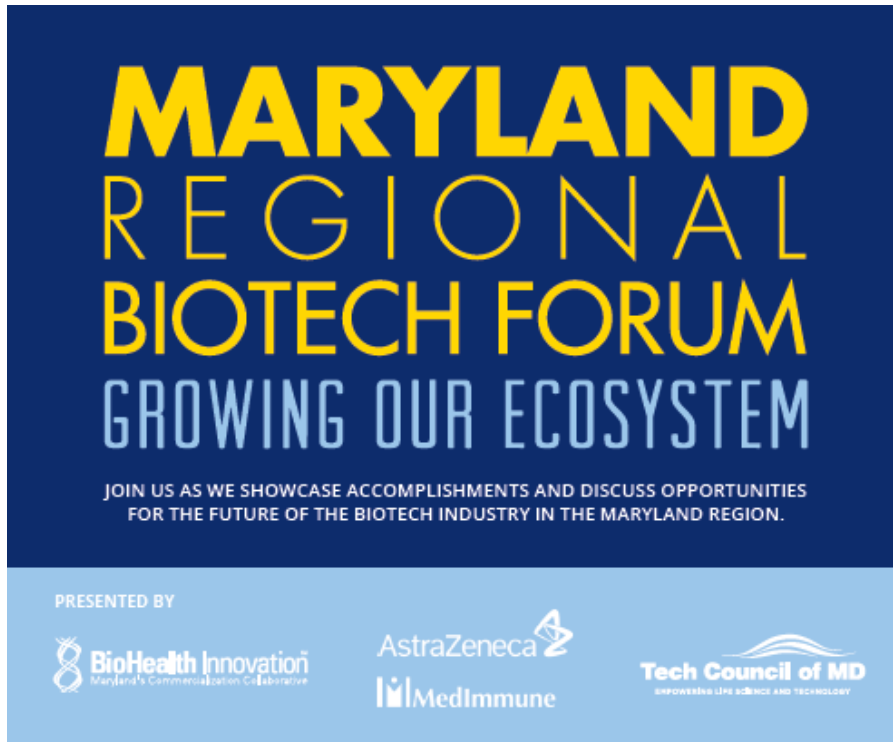
- Will provide direct seed and early-stage equity investments ranging from \$500,000 to \$2,000,000
- Focused on BioHealth companies that fall into the 4 categories: Therapeutics, Medical Devices, Diagnostics, and Health IT
- Goal: Achieve a \$20,000,000 to \$50,000,000 initial fund
- Expectation: 30% of companies generating 10x the original investment
- 2015 – Target first close

BHI International Soft Landing



- | | |
|---------|---------------|
| China | Korea |
| Estonia | Netherlands |
| Germany | North America |
| Greece | South America |
| India | Spain |


Maryland Regional Happenings





MARYLAND
REGIONAL
BIOTECH FORUM
GROWING OUR ECOSYSTEM


JOIN US AS WE SHOWCASE ACCOMPLISHMENTS AND DISCUSS OPPORTUNITIES FOR THE FUTURE OF THE BIOTECH INDUSTRY IN THE MARYLAND REGION.

PRESENTED BY

 **BioHealth Innovation**
Maryland's Commercialization Collaborative

 **AstraZeneca**

 **MedImmune**

 **Tech Council of MD**
EMPOWERING LIFE SCIENCE AND TECHNOLOGY

1. Regional branding/marketing campaign
2. Development of community calendar
3. Building and keeping talent in the region
4. Leadership Committee to be formed to develop a regional strategic growth plan



THE ATLANTIC VACCINES & IMMUNOTHERAPEUTICS SUMMIT
LOCAL INNOVATION. GLOBAL IMPACT.
MAY 7-8, 2015 • BETHESDA NORTH MARRIOTT HOTEL & CONFERENCE CENTER

 **Tech Council of MD**
EMPOWERING LIFE SCIENCE AND TECHNOLOGY

TECHCOUNCILMD.COM

BHI Website and News



BHI Website

The BHI website has news, an events calendar, research publications, regional organization feature stories and resources for the biohealth industry.

<http://www.biohealthinnovation.org>



BHI News

BHI's weekly e-newsletter highlights the Central Maryland region's news articles, national biohealth trends and feature stories.

<http://www.biohealthinnovation.org/news>

Entrepreneur Training Programs



I-CORPS



DC I-corps is a custom commercialization program for biohealth related technologies and startup companies. The six-week program guides teams through a rigorous market assessment and validation process ultimately creating a viable business model.



National Institutes
of Health



The BHI Commercialization Consulting Club is a place where BHI's EIRs and Commercialization Consultants can discuss all aspects of the technologies being researched and make new networking connections.



The Postdoc Conference & Career fair is for current postdoctoral fellows working in Washington, D.C. area federal labs and universities, and for companies recruiting high-level S.T.E.M. (Science, Technology, Engineering and Mathematics) professionals.

KAUFFMAN | **FASTTRAC**.
Startup your idea.

Not currently active



The FastTrac program is a practical, hands-on, entrepreneur-learning program designed to help entrepreneurs hone the skills needed to create, manage, and grow a successful business.

INNoVATE™

Not currently active



The INNovATE program provides applied training for postdoctoral fellows, research scientists, and other professionals who want to start life science based companies.

BHI: The Triple Bottom Line

Grows high-paying jobs and businesses

A large, hollow, downward-pointing arrow with a thin grey outline, centered between the first and second boxes.

Expands tax base; improves economic vitality

A large, hollow, downward-pointing arrow with a thin grey outline, centered between the second and third boxes.

...and benefits human health!

A Call to Action

“Somebody has to do something, and it’s just incredibly pathetic that it has to be **US.**”

- Jerry Garcia of the Grateful Dead



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