



**BioHealth Innovation**<sup>SM</sup>  
Maryland's Commercialization Collaborative

## Prince George's County Economic Development Meeting

Rich Bendis  
1/16/2013

[www.BioHealthInnovation.org](http://www.BioHealthInnovation.org)

# “The Region”--Central Maryland

**Unrivaled Research Assets**  
**Unfulfilled Commercial Promise**



# State of Maryland: Federal & University Resources



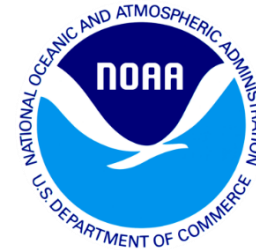
**59 Federal Laboratories, Centers, & Institutes in Maryland**

**Maryland Federal R&D investment exceeding \$12 billion annually**



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

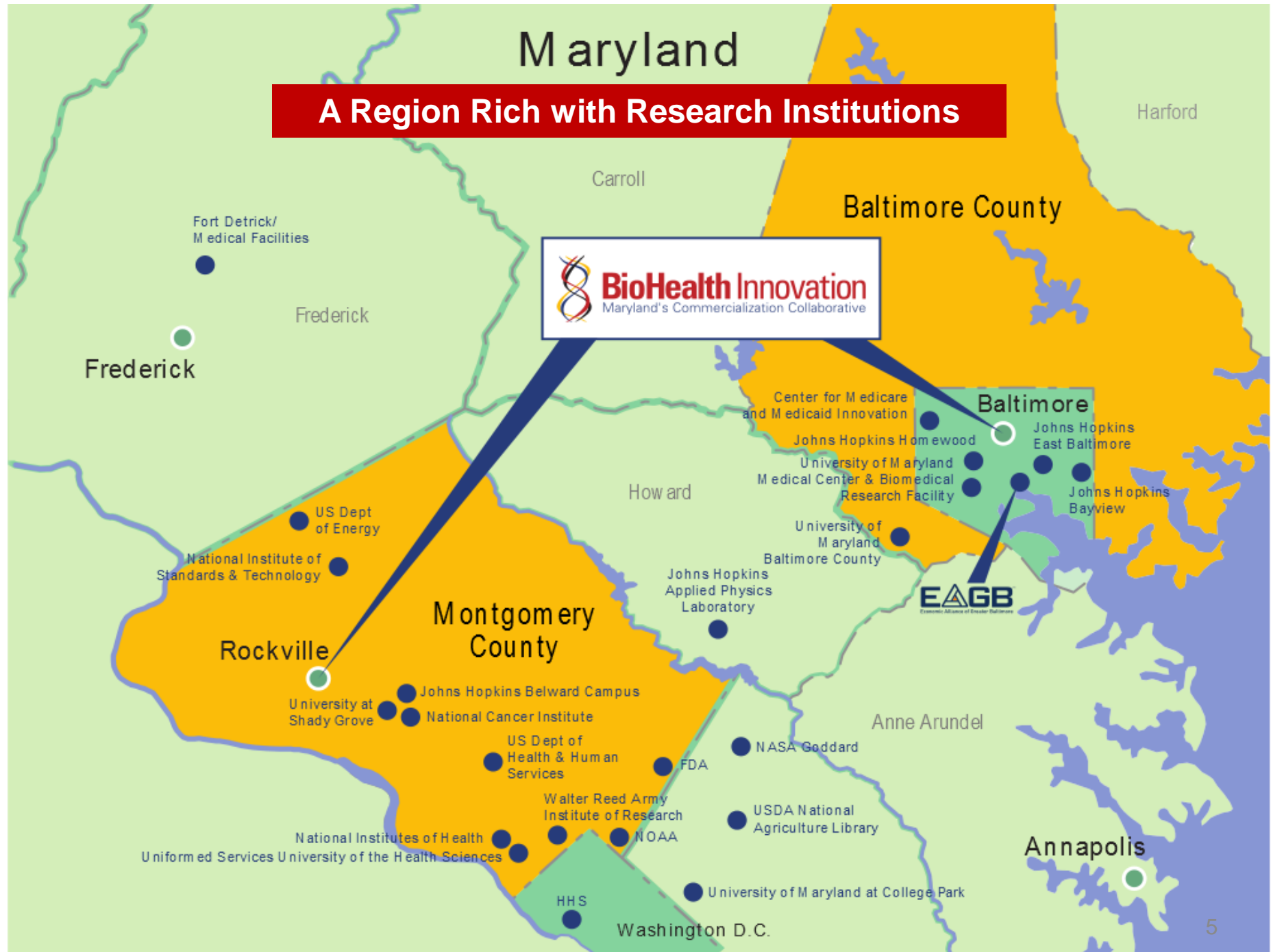
# Prince George's County Federal Assets



**Joint Base Andrews**

# Maryland

## A Region Rich with Research Institutions



# 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

Connects regional innovation assets

Develops an entrepreneurial talent and support pipeline

Attracts funding for technology commercialization

Evaluate commercially relevant federal and university technology for new spin-offs

# BioHealth Regional Innovation Cluster Assets



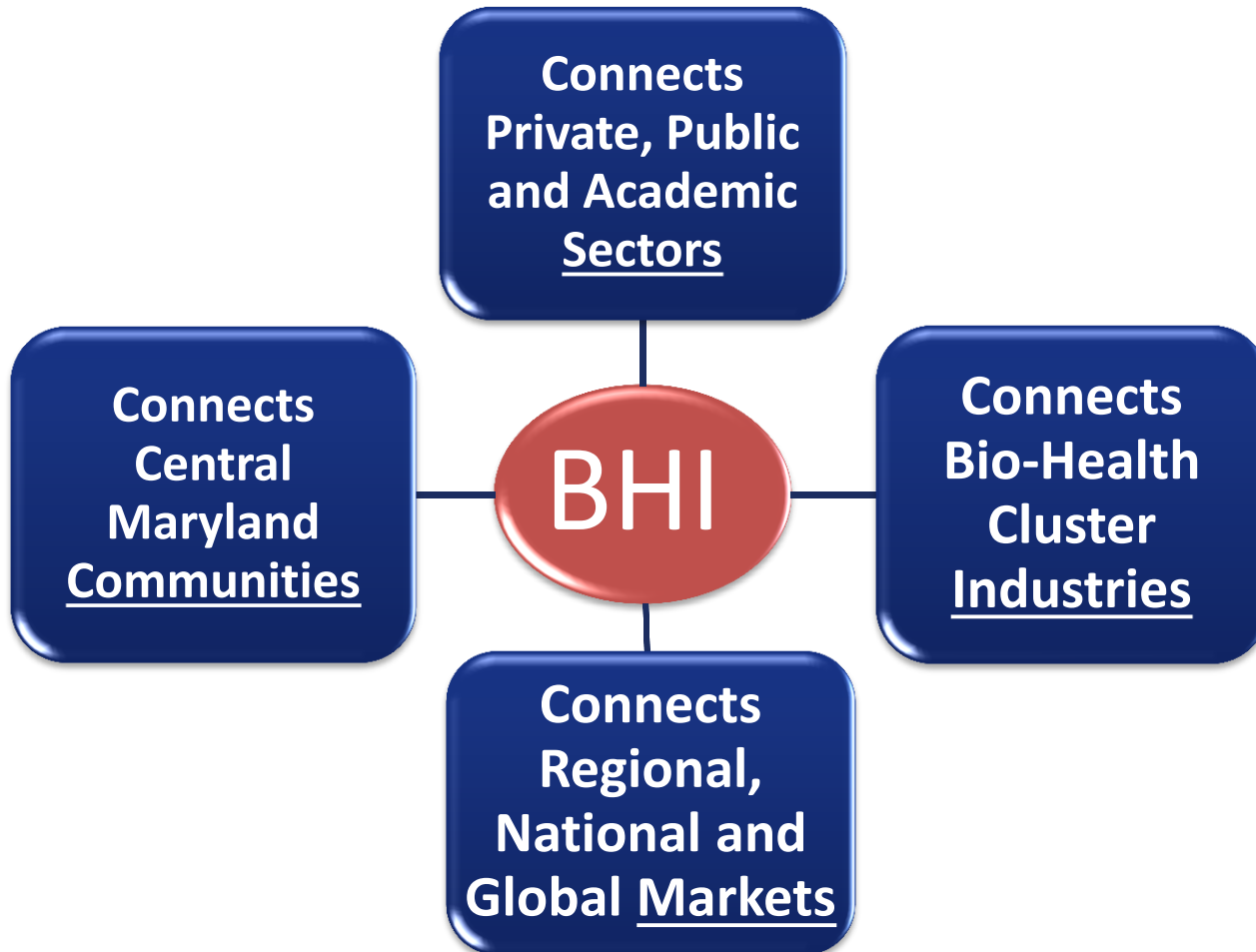
# What is A Regional Innovation Intermediary?

- An organization at the Center of the region's, state's and country's efforts
  - Align local technologies, assets and resources
  - Advance Innovation
- Regionally-oriented
- Private-public partnership, 501(c)(3) nonprofit
- Market-driven, private sector-led
- Neither a government initiative, nor a membership organization





# **BHI: An Innovation Intermediary that Connects** **Sectors, Industries, Communities, & Markets**



# Regional BioHealth Ecosystem Partners



# BHI Partners and Sponsors



JOHNS HOPKINS  
UNIVERSITY



MedImmune



NEA



ERNST & YOUNG



VENABLE<sup>®</sup>LLP



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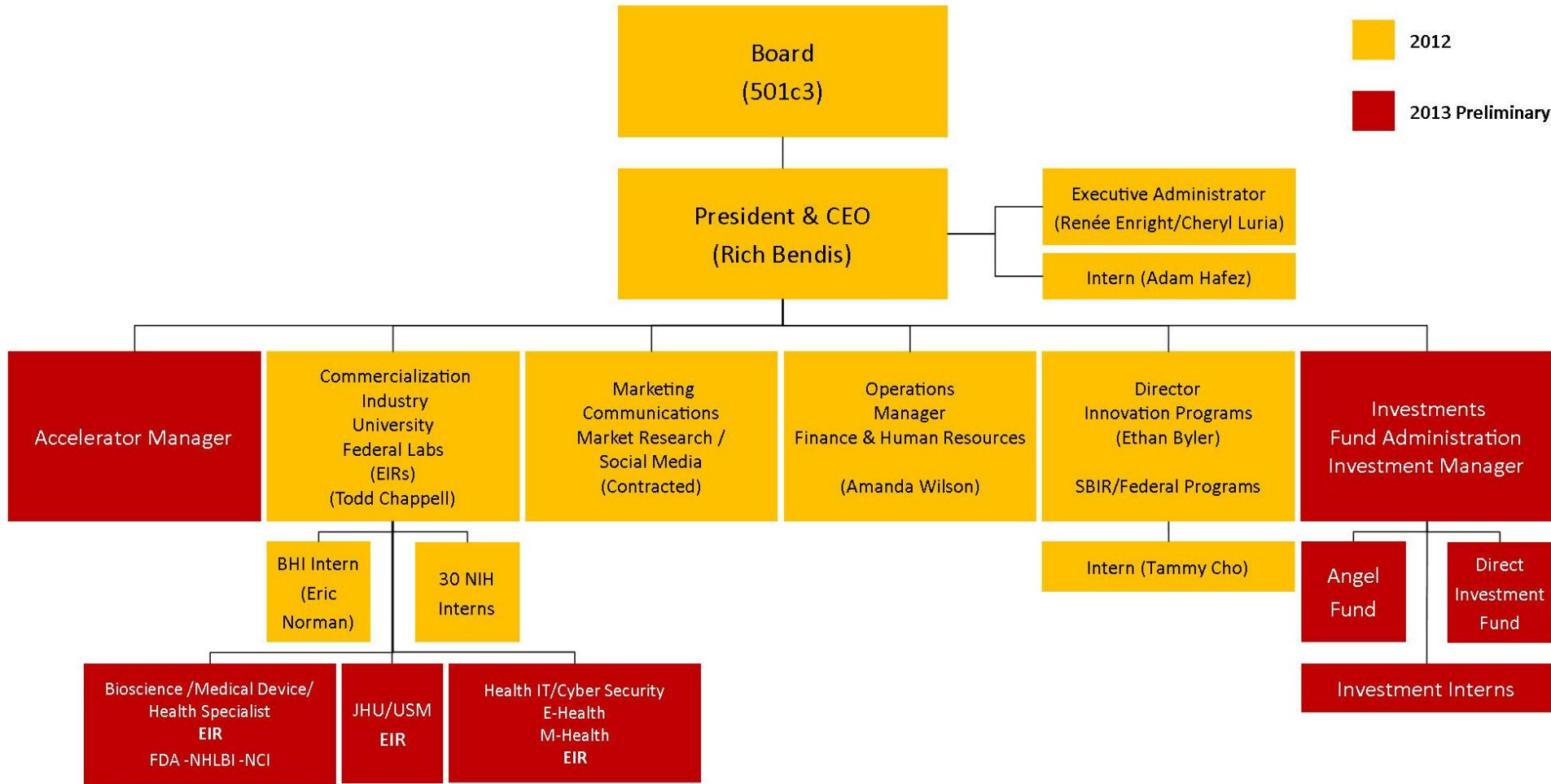
**Jens Eckstein**  
President, SR One (GSK)



**Thomas Street**  
Assistant Chief Administrative Officer, Montgomery  
County Government

# BHI Organizational Chart

2012  
 2013 Preliminary



# BHI/EIR 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**

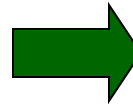
**“It Works!”**



**PROOF OF COMMERCIAL RELEVANCE**  
**(Market Pull)**

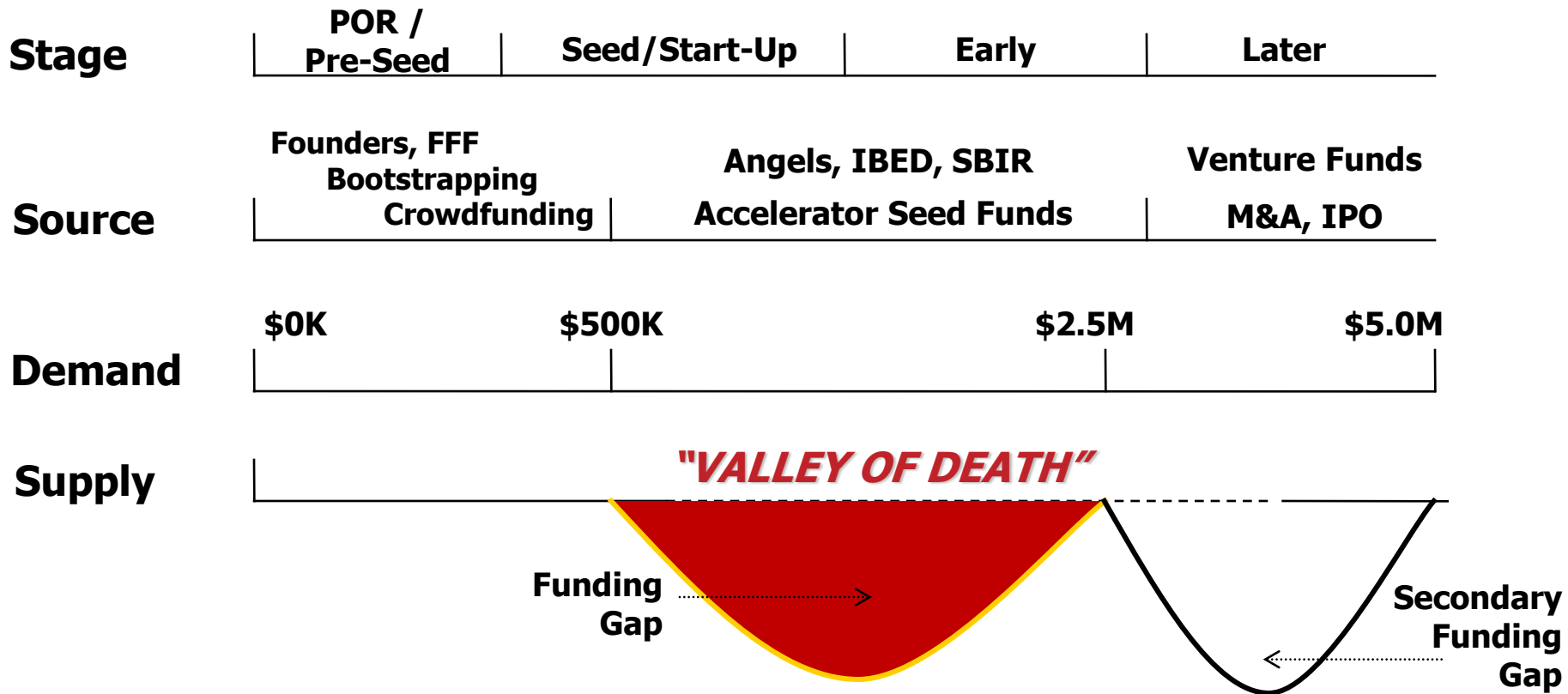
**“It Works To Solve A Problem”**

**“I’ll Buy It”**



# Innovation Capital

## “VALLEY OF DEATH”





# Central Maryland Innovation Capital Map

## Capital Sources by Investment Stage

Pre-Proof of Concept \$25K - \$1.5M (over 5 years)	Translational Research / Proof of Concept \$15K - \$2M	Proof of Commercial Relevance / Pre-Seed \$50K - \$500K	Seed / Start-Up \$50K - \$1M	Early Stage \$250K - \$2M	Later Stage \$2M+
<ul style="list-style-type: none"> <li>NIH R01</li> <li>NIH R03</li> <li>NIH R21</li> <li>Small Business Technology Transfer Research Grant (STTR) Phase I</li> <li>Innovate Maryland</li> </ul>	<ul style="list-style-type: none"> <li>NIH Center for Accelerated Innovations (CAI)</li> <li>NCATS Cures Acceleration Network (CAN)</li> <li>Small Business Innovation Research Grant (SBIR) Phase I</li> <li>Maryland Stem Cell Research Fund (MSCRF)</li> <li>TEDCO University Technology Development Fund (UTDF)</li> <li>TEDCO TechStart</li> <li>Maryland Biotechnology Center's Translational Research Award</li> </ul>	<ul style="list-style-type: none"> <li>Maryland Industrial Partnerships (MIPS @ UMD)</li> <li>Maryland Biotechnology Center's Biotechnology Commercialization Awards</li> <li>TEDCO Maryland Technology Transfer and Commercialization Fund (MTTCF)</li> <li><b>BHI SBIR/STTR Commercial Relevance</b></li> <li><b>BHI Commercial Relevance Fund (CRF)</b></li> </ul>	<ul style="list-style-type: none"> <li>Dingman Center Angels (UMD)</li> <li>TEDCO Johnson &amp; Johnson Joint Investment Program</li> <li>Propel Baltimore Fund</li> <li>SBIR / STTR Phase II</li> <li><b>BHI Central Maryland Angel Fund</b></li> <li>National Association of Seed &amp; Venture Funds (NASVF)</li> <li>Angel Capital Association (ACA)</li> </ul>	<ul style="list-style-type: none"> <li>Maryland Health Care Product Development Corporation (MHCPDC)</li> <li>Invest Maryland: Maryland Venture Fund</li> </ul>	<ul style="list-style-type: none"> <li>Maryland Venture Fund Authority</li> <li>ABS Capital Partners</li> <li>Greenspring Associates</li> <li>Novak Biddle Venture Partners</li> <li>Sterling Venture Partners</li> <li>Harbert Venture Partners</li> <li>JMI Equity</li> <li>National Venture Capital Association (NVCA)</li> </ul>
<ul style="list-style-type: none"> <li>Association of University Resource Parks (AURP)</li> <li>Association of University Technology Managers (AUTM)</li> <li>Licensing Executive Society (LES)</li> </ul>			<ul style="list-style-type: none"> <li>New Enterprise Associates (NEA)</li> <li>TDF</li> <li>Abell Venture Fund</li> <li>MMG Ventures LP</li> <li>Mid-Atlantic Venture Association (MAVA)</li> </ul>		

### Funding Type Key

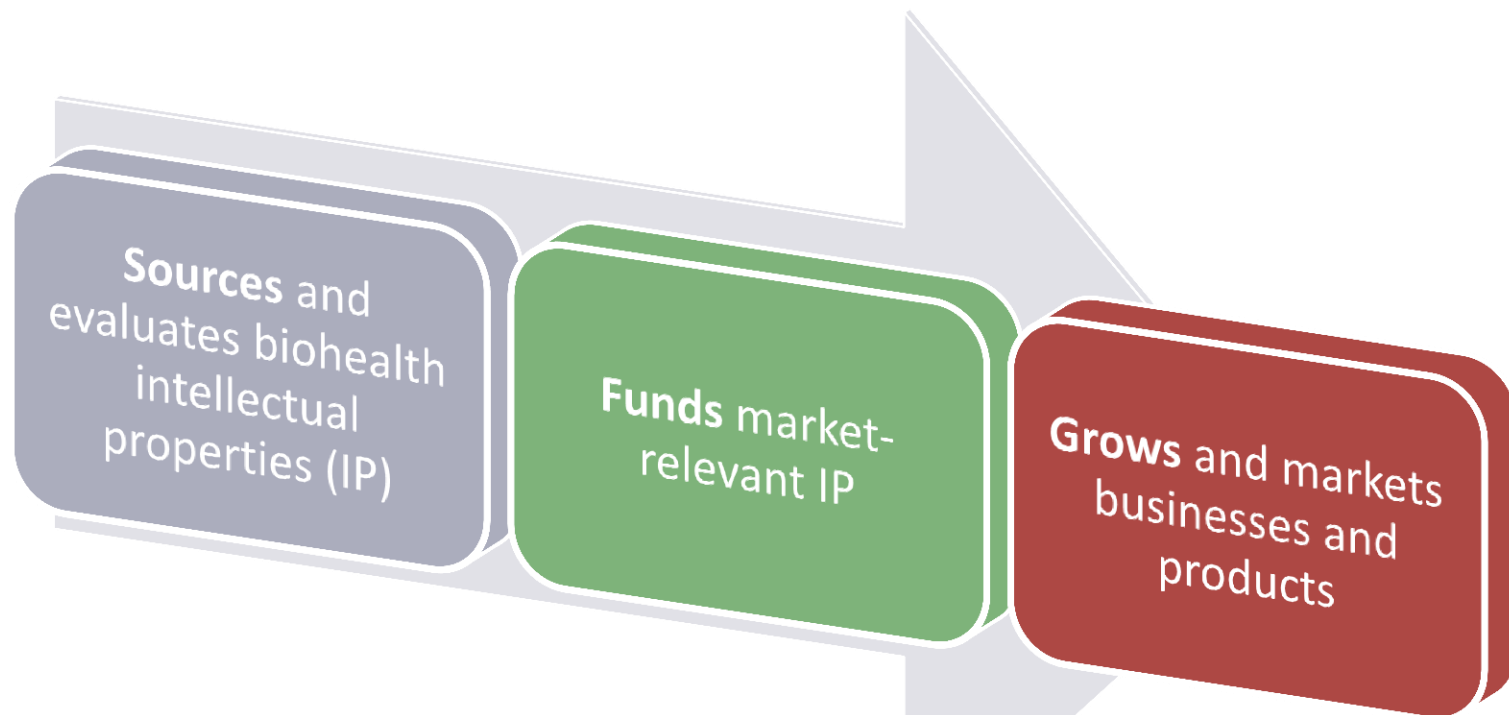
- Academic
- Associations
- BioHealth Innovation, Inc.
- State of Maryland
- Accelerator
- Federal
- Innovation-based Economic Development (IBED)
- Venture Capital

### Tax Credits

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

# How does **BHI** work?

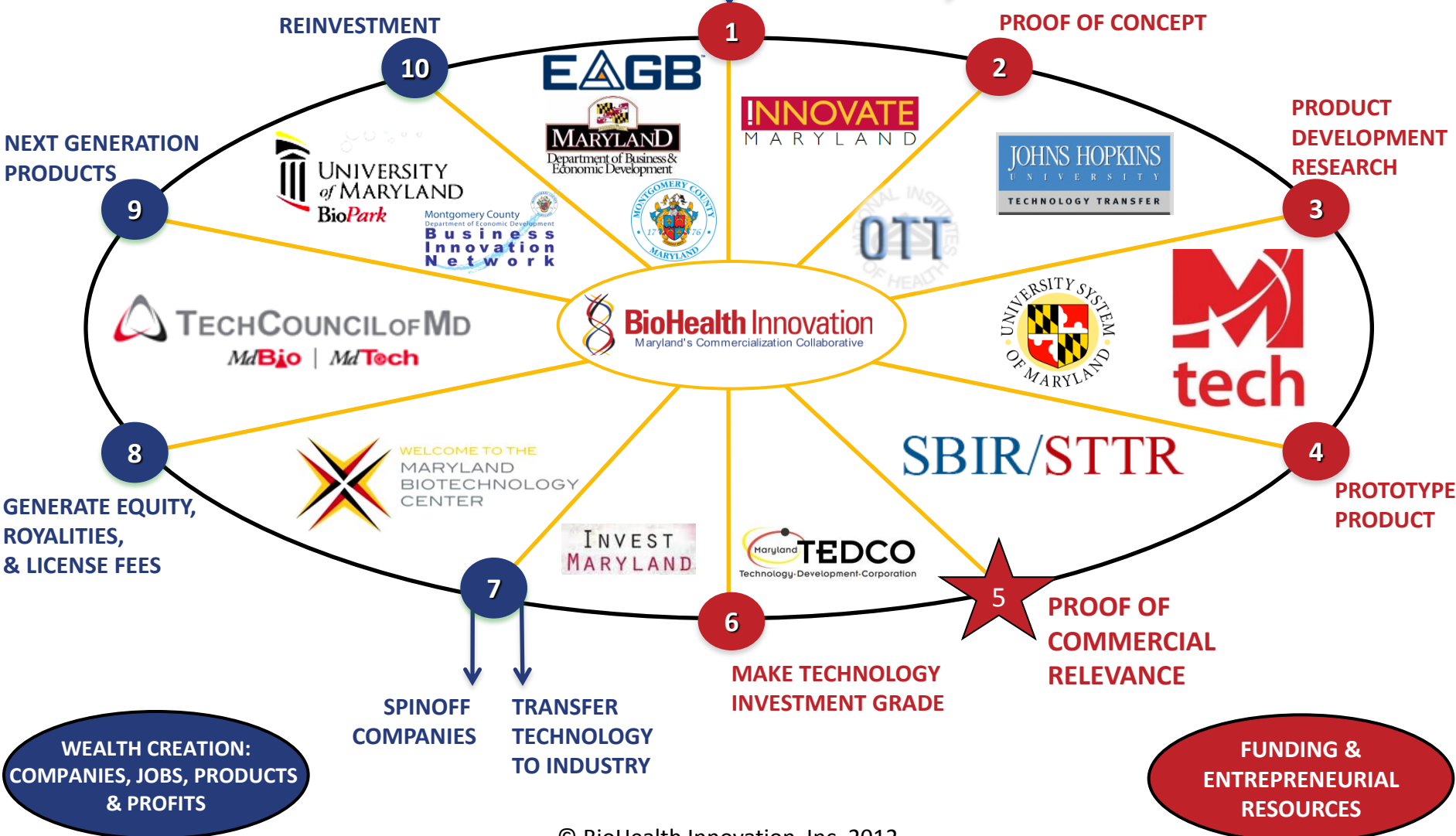
## Commercialization Pipeline



# BHI Commercialization Model

UNIVERSITIES, FEDERAL GRANTS, PRIVATE R&D, BASIC RESEARCH, INVENTIONS

PUBLICATIONS  
PhD's  
TENURE  
PATENTS



# Partnership Intermediary Agreements (PIA)



- **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.



- **PIA/MOU between BHI and FDA** to assist in evaluation and potential commercialization of FDA technology through a dedicated EIR is being negotiated.



- **PIA between BHI and the Telemedicine & Advanced Technology Research Center (TATRC)** to capture USAMRMC and TATRC research outcomes and promote further research, product development, commercialization, and economic development opportunities.  
TATRC has funded 241 MD based projects over the last 12 years.

# Entrepreneur-in-Residence (EIR)

- A team leader who combines scientific, financial/VC and entrepreneurial management experience to:
    - Perform due diligence
    - Develop biohealth project-focused companies
- Proactively** identifies and commercializes **market-relevant** intellectual properties from:
- Federal Labs
  - Universities
  - Private Sector



Todd Chappell

## Progress (10 months into Program)

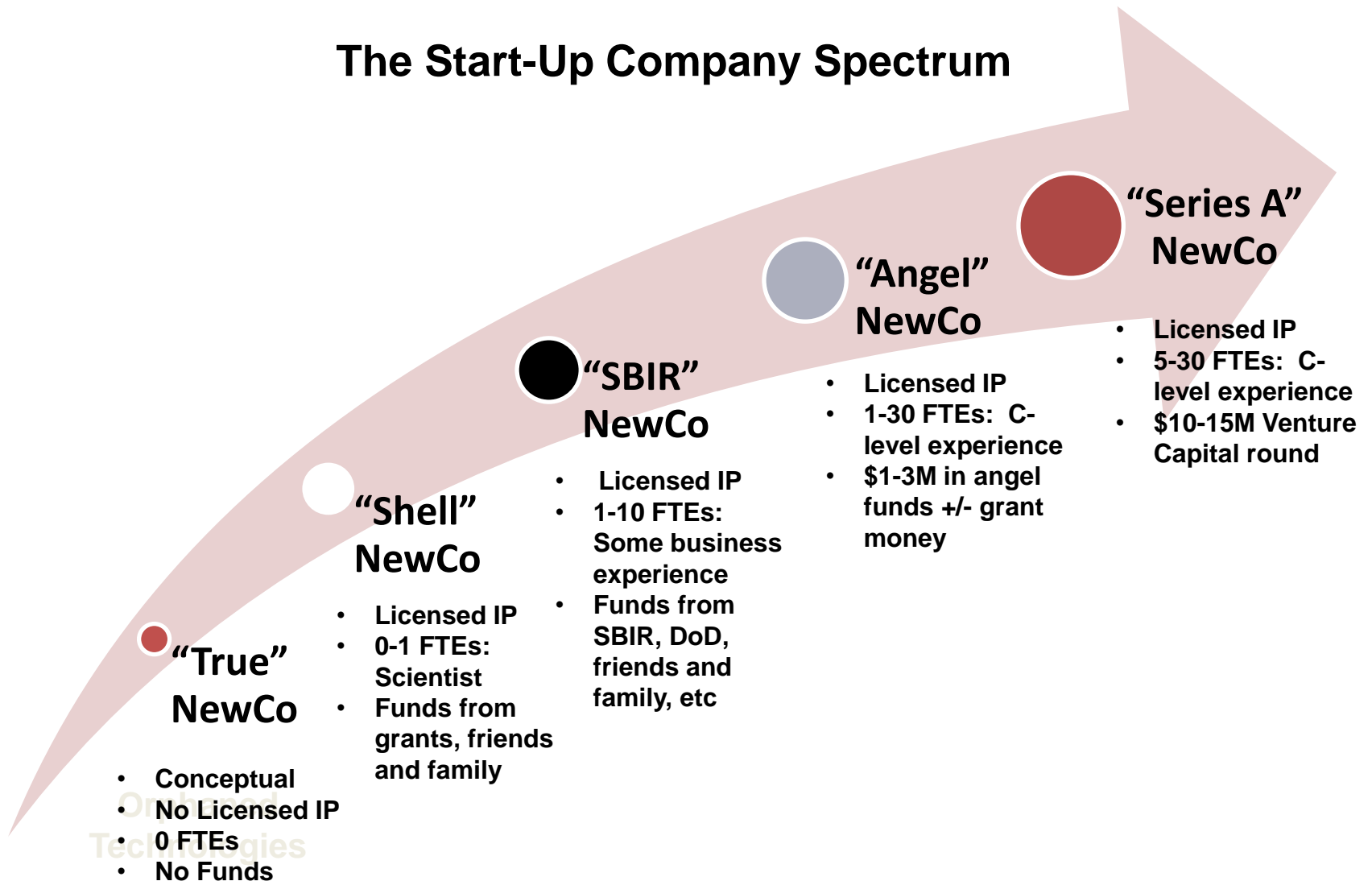
- 97 Innovations identified and initially screened
- 63 Progressed to Secondary Analysis (Safety & Efficacy Profiling, IP Diligence, Regulatory & Development Pathways) and 12 to Primary Analysis
- Entered into consulting agreement with Perceptive Navigation
- Entered into agreement with Advanced Personalized Diagnostics, LLC
- Option Agreement for stem cell technology (JHU)
- Goal to fund the operation of more EIRs

# EIR Criteria

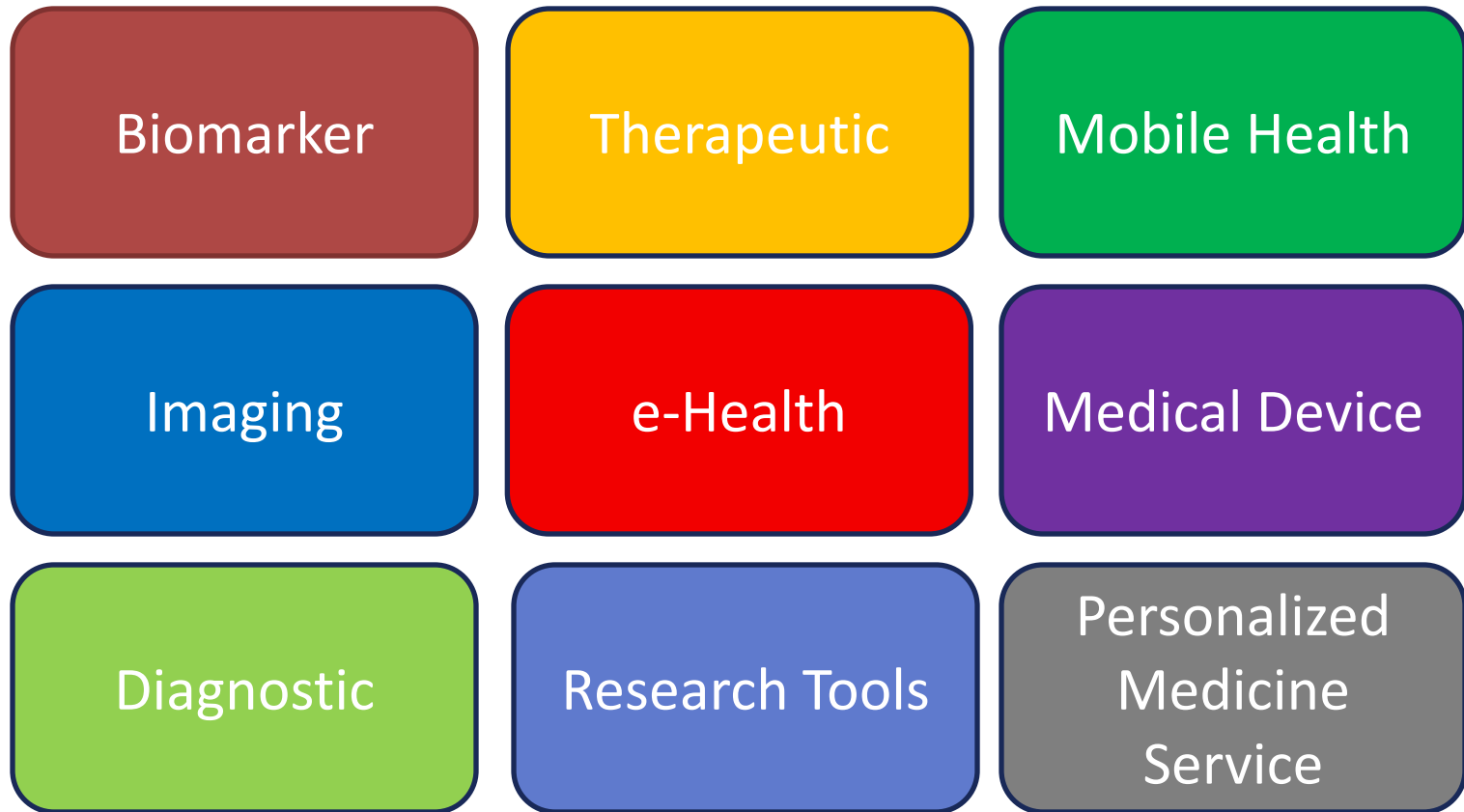
- **Senior management in an early stage life sciences startup**
  - **Entrepreneurial life science start up or spin out activity**
- **Management in a organization that specializes in startup companies**
- **Experience in a seed stage venture capital firm**
- **Served in a business development role in a high performing university or business development organization that successfully formed new ventures**
- **Served in a business development role, product development role, or other capacities for biotech products or services that enable substantial knowledge of the earliest stages of development for a new technology startup company**

# EIR Value Proposition

## The Start-Up Company Spectrum



# Different Technologies = Different Strategy





# EIR Expectations



- **Assist OTT in the evaluation of existing technologies**
  - **Provide an entrepreneurial perspective to OTT in its evaluation of new licensing proposals**
  - **Advise OTT on opportunities for new ventures based on NIH/FDA technologies**
  - **Assist with developmental strategies**
  - **Mentor scientists to help ensure their research becomes commercially valuable**
- **Identify market viable innovations from NIH and other regional institutions**
  - **Act as liaison among regional biohealth stakeholders and NIH**
  - **Primary and secondary commercial analysis of lead technologies**
  - **Develop novel technologies that are at conceptual stage**
  - **Act as catalyst to license most interesting technologies and fund start-up companies**

# EIR Integration into NIH System

- **Office at the central Office of Technology Transfer (OTT)**
  - Volunteer status
  - Report to Director and Deputy Director of centralized OTT
  - Full access to NIH campus and staff
- **Active participant in Technology Review Groups at top three institutions**
  - Review of patent prosecution decisions for new and existing inventions
- **Active participant in Technology Development Coordinator meetings**
  - Key decisions on selected technologies
- **Access to database (SYNAPSE) detailing invention filings**

# Maryland Universities/EIR Interaction

**! INNOVATE**

Maryland's Innovation Initiative

- **\$5.8M budget**
- **5 University partners**
  - 1-5
- **5 University site miners**
- **40 University pre proof-of-concept technologies funded**
- **\$25-\$150K funded per technology**



- **Regular meetings between BHI/EIR and site miners**
- **BHI identifies most commercially relevant technologies**
- **BHI and INNOVATE MD partnership opportunities**
- **Creating a JHU/USM EIR**
- **BHI creating Commercial Relevance Advisory Board**

# EIR Expansion 2013



National Heart  
Lung and Blood Institute  
People Science Health

National Heart Lung and Blood Institute



National Cancer Institute



Food and Drug Administration

JOHNS HOPKINS  
UNIVERSITY



University EIR



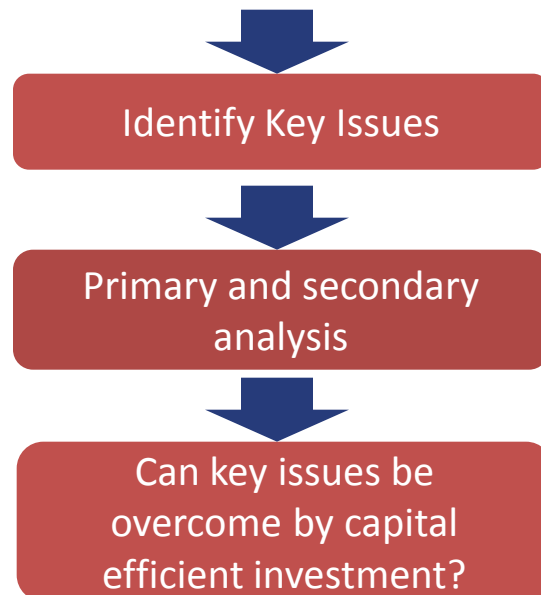
Health Information Technology EIR



# Early-Stage Analysis of Commercial Relevance

## Selected Criteria for Value Proposition

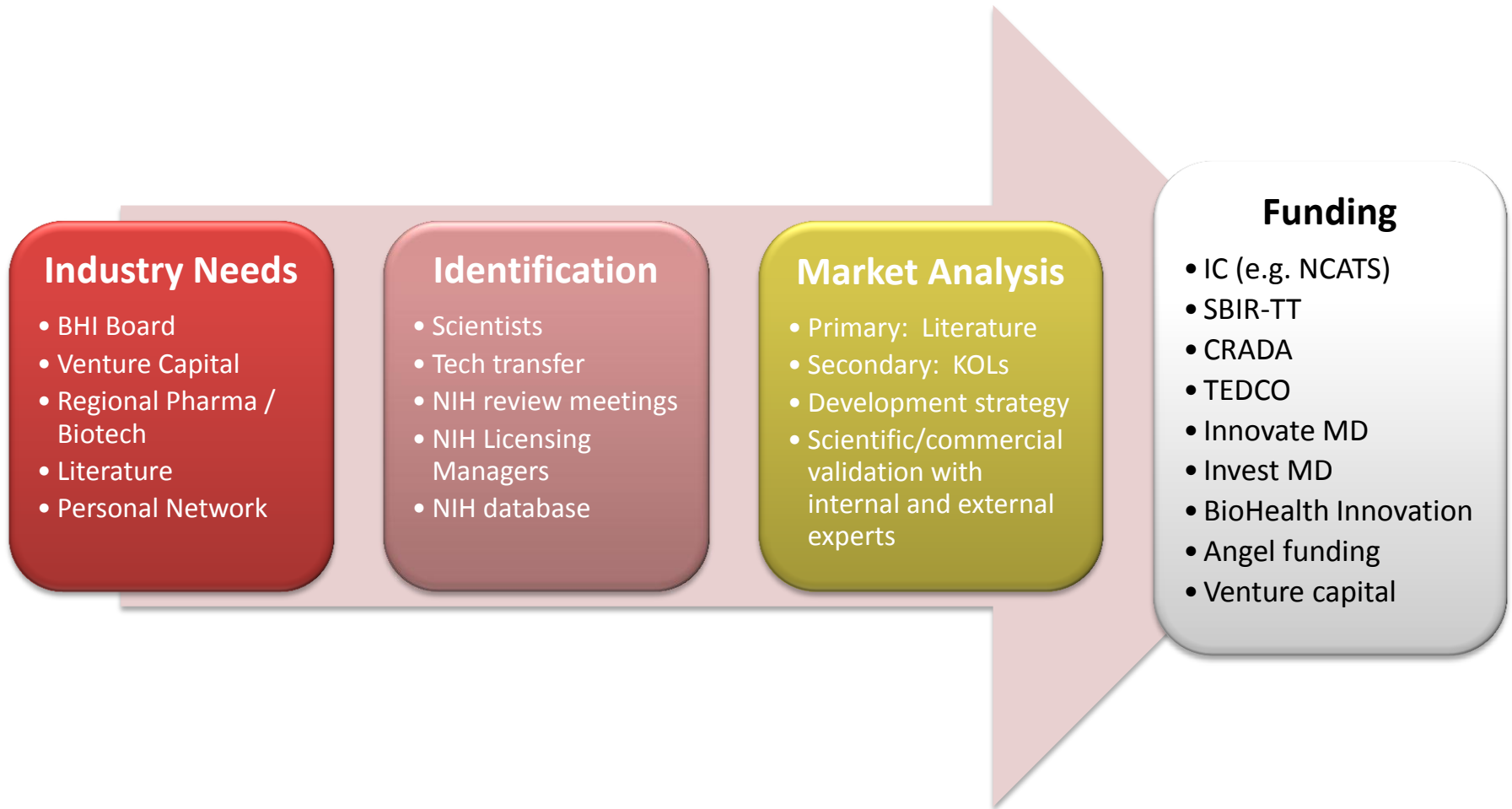
Differentiation	Efficacy Data	Market Size	Reimbursement
Safety Data	Unmet Medical Need	Stage of Development	Industry Interest
Intellectual Property	Competitive Landscape	Advantages for Clinical Development	Novelty



# Key Considerations for Technology Focus

- Clear unmet need that benefits public health
- First-in-class, best-in-class therapies
- Target therapeutic areas that reflect strategic objectives
- Clinical development advantage
- Relevance to strategic needs

# What is the Overall Process for Licensing / Creating Company?



# BHI Client Companies

## Advanced Personalized Diagnostics, LLC



Advanced Personalized Diagnostics, LLC (APD) is devoted to providing personalized services to guide development and cancer treatment decisions.

## Ahead Research, Inc.



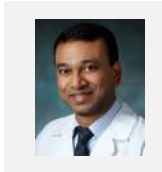
Ahead Research, Inc. is the parent company of the Symcat service that is delivered as a web and mobile application that matches patients to healthcare providers using data driven algorithms.

## Mimetas



Mimetas develops and markets Organ-on-a-Chip solutions for the pharmaceutical industry.

## Perceptive Navigation, LLC



Perceptive Navigation LLC is a medical device development company that intends to create medical devices related to image-guided, minimally-invasive niche markets.



# BHI Innovation Capital

- **SBIR/STTR Assistance Program** - The BHI SBIR/STTR Assistance Program (in development) will provide assistance to biohealth-driven companies in the Central Maryland region in preparing for high-quality SBIR/STTR grant proposals for submission to federal funding agencies.
- **BHI Angel Fund** - The BHI Angel Fund (in development) will be a member-managed private equity investment fund that bridges the gap between pre-seed investments and institutional venture capital serving the Central Maryland region entrepreneurial needs.
- **BHI Commercial Relevance Investment Fund** - The BHI Commercial Relevance Investment Fund (in development) will be a pre-seed and early-stage, equity-based innovation capital fund to help grow, attract, retain and connect Central Maryland biohealth innovation-based companies that need financing to grow their enterprises.

# Maryland SBIR/STTR Awards: **NIH** Success Rates

**Phase I:**  
**Ranked 32<sup>nd</sup> in Nation**

**Phase II:**  
**Ranked 36<sup>th</sup> in Nation**

State	Phase I		State	Phase II	
	Success Rate	Total Funding		Success Rate	Total Funding
Massachusetts	23.4%	\$187,274,728	Massachusetts	39.0%	\$229,682,498
North Carolina	21.7%	\$57,184,183	North Carolina	46.9%	\$74,995,397
Michigan	20.6%	\$36,269,084	Michigan	40.2%	\$50,861,560
Pennsylvania	20.6%	\$65,590,113	Pennsylvania	41.7%	\$77,613,326
Ohio	20.5%	\$48,984,571	Ohio	36.6%	\$49,296,383
California	19.4%	\$299,818,982	California	37.2%	\$299,169,067
<b>Maryland</b>	<b>18.8%</b>	<b>\$93,826,896</b>	<b>Maryland</b>	<b>35.6%</b>	<b>\$90,984,136</b>
Texas	17.1%	\$62,222,413	Texas	37.3%	\$67,019,062

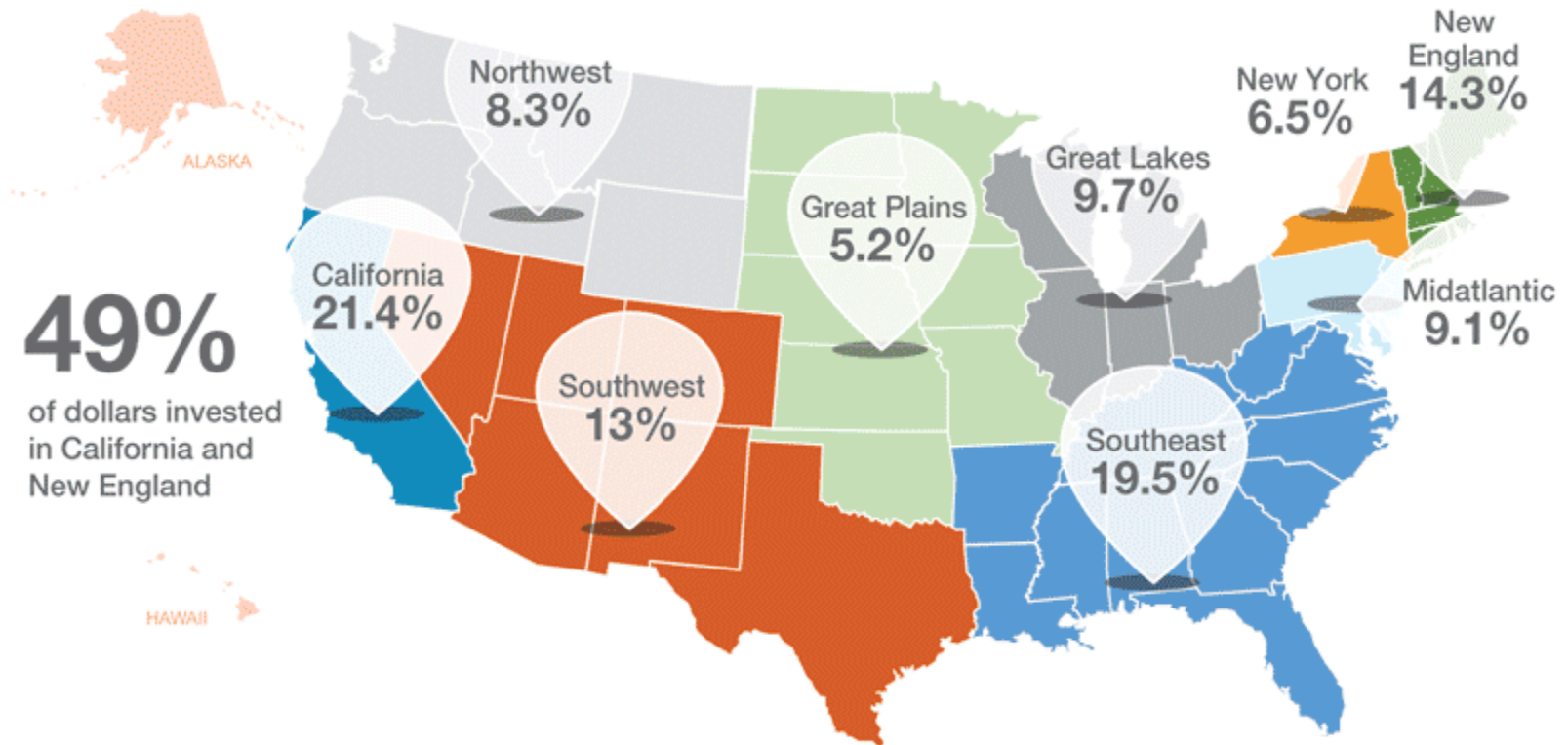
**Maryland ranks 19<sup>th</sup> in population in the US**

# BHI Commercial Relevance Program for SBIR / STTR and other Federal Funding

1. SBIR/STTR Pre-Application Form submitted by small businesses online @ BHI
2. Scoring and feedback provided on Pre-Application by 3 qualified reviewers from a national pool using an online evaluation system
3. Company receives feedback on concept moving forward on whether articulated as a strong project
4. Up to \$3,000 financial grant considerations offered to assist in preparing full SBIR/STTR submission using Consultants, Technical Writers, or other service providers

# US Angel Deals in Q3 2012

## by Region



Pre-money valuation for early stage angel group deals dropped by \$1 million to \$2.6 million over the previous quarter. (Halo Report 2012)

# The increasing importance of Angels

- ✚ 300,000+ angels are investing \$30 billion per year in close to 50,000 ventures
- ✚ 100+ Angel Groups formed nationwide in last 5 years
- ✚ In many cases, Angel Groups are becoming alternatives to early stage VCs and incubators
- ✚ No dedicated Angel Funds in Maryland

# Angel Fund Competitive Advantages

Individual Angels	Angel Groups	Angel Funds
<ul style="list-style-type: none"><li>▪ <b>Typically poor returns</b></li><li>▪ <b>Why:</b><ul style="list-style-type: none"><li>▪ Lack of expertise</li><li>▪ Generally weak due diligence</li><li>▪ Less eyes on deal</li><li>▪ Intensive workload</li><li>▪ Inadequate diversification</li></ul></li></ul>	<ul style="list-style-type: none"><li>▪ <b>Performance – a bit better:</b><ul style="list-style-type: none"><li>▪ Increased chance of an expert at the table</li><li>▪ More people available to share due diligence</li><li>▪ More eyes on deal</li></ul></li></ul>	<ul style="list-style-type: none"><li>▪ <b>Competitive advantages to get attractive returns:</b><ul style="list-style-type: none"><li>▪ Only do deals where expert is leading deal</li><li>▪ Higher quality due diligence</li><li>▪ More eyes on deal</li><li>▪ Vote process selects only the best deals</li><li>▪ Professional Administration</li><li>▪ Diversification</li><li>▪ Follow-on reserves</li></ul></li></ul>

# BHI Angel Fund

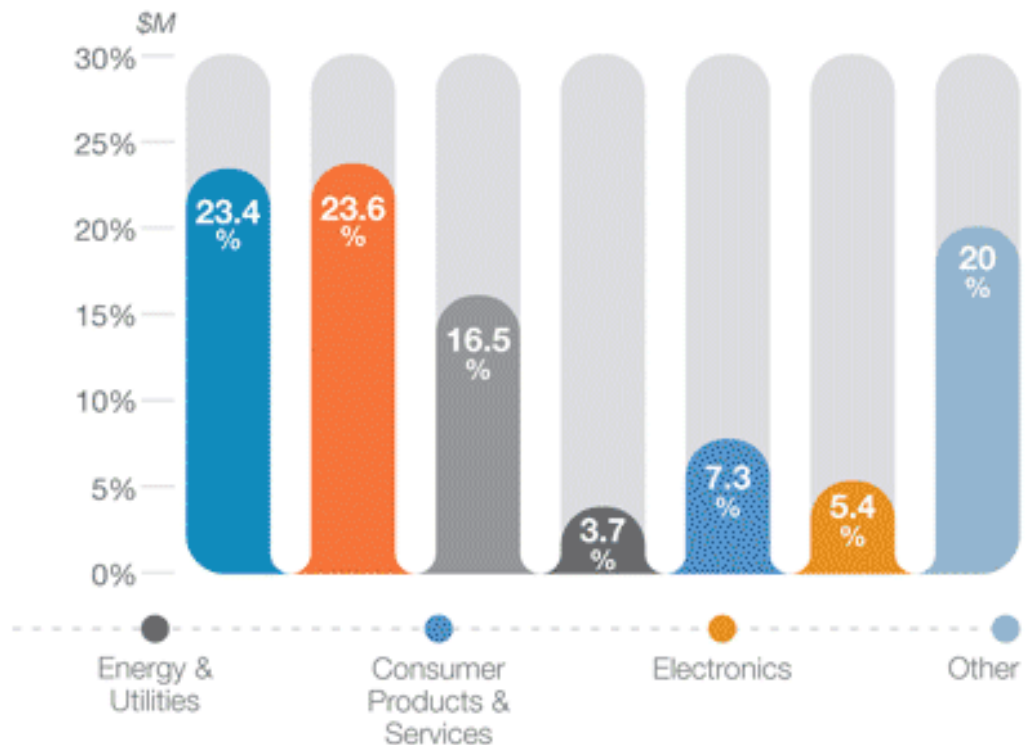
- ✚ Maryland has no organized, dedicated professionally managed biohealth angel fund
- ✚ Over the past 15 years, high-technology angel investing has become more professional, organized, and more visible.
- ✚ When angels co-invested with other investors, the median round size was nearly \$1.6 million, the highest since the second quarter of 2011 (Halo Report)
- ✚ Planning a BHI managed accredited angel investor fund; Initial target fund size of \$3M - \$5M
- ✚ 2013 – Assembling Private Placement Memorandum; Identify Investors

# 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



Healthcare companies receive largest share of dollars; Mobile share jumps 6% over Q2 2012



Source: Q3 2012 Halo Report



# Health IT Accelerator

- ✚ A Health IT Accelerator is an intensive 12-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.
- ✚ No HIT accelerators currently in Maryland
- ✚ Located in a Central Maryland Co-Working space
- ✚ Retain promising high growth HIT entrepreneurs in MD

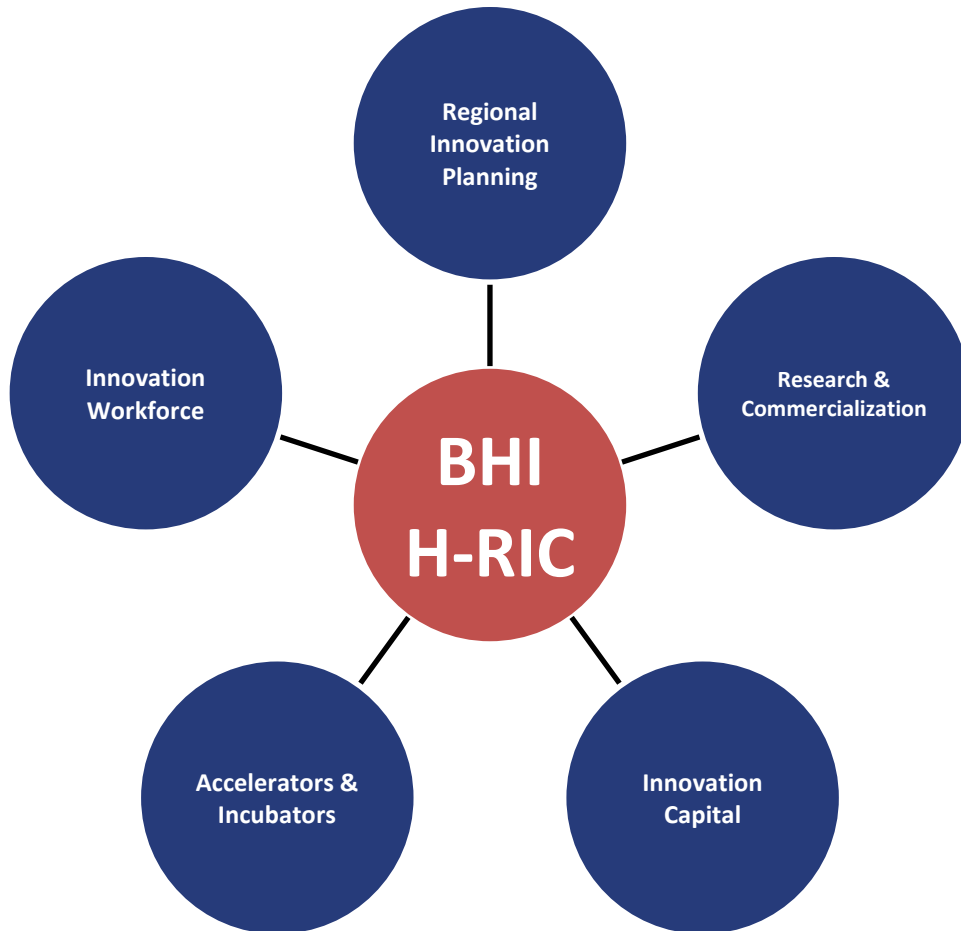
# Health IT Accelerator



## Year 1 Accelerator

1 <sup>st</sup> Quarter	2 <sup>nd</sup> Quarter	3 <sup>rd</sup> Quarter	4 <sup>th</sup> Quarter
Complete Market Analysis of Sector and Opportunity			
Assemble Management Team, Mentors, Technologists, Supporting Business Professionals for the Health IT Accelerator			
	Finalize Program Processes, Protocols & Agreements		
	Publicize and Market the First Class and Opportunity (90 Day Process)		
		Launch of first Health IT class	
			Graduation Event with Investors

# BHI H-RIC Model



## Health Regional Innovation Cluster (H-RIC)

- Regional, cluster-based economic development model
- Modeled after the Department of Energy's Regional Innovation Cluster
- Connects innovation assets to related industries
- Advances human health and economic prosperity
- Focuses on proof of commercial relevance

# BHI News & Website



## BHI Web site

The BHI Web site 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>

# Innovation Resource Guide

## *“Financing and Entrepreneurial Resource for Montgomery County and the Greater Baltimore Region”*

- Entrepreneur and Innovation Resource Network
- Innovator Financing Guide
- The Startup’s Guide to Intellectual Property
- Guide to Federal Lab Tech Transfer



### Central Maryland Biohealth Entrepreneur’s Resource and Finance Guide

- Provides **businesses and entrepreneurs** with information to access resources necessary to **grow** their biohealth businesses.
- **A-Z directory** of relevant businesses, organizations and resources for business assistance, economic development, innovation research, investment and technical assistance.
- A **comprehensive financing guide** designed to prepare businesses and entrepreneurs to navigate the complicated world of financing and investment.
- A **startup’s guide to intellectual property** that will introduce entrepreneurs to the complex issues surrounding patents, trademarks, copyrights and trade secrets.
- The guide will be **free** and available in both **print and electronic** formats.



#### Benefits of Inclusion:

- Exposure to businesses, entrepreneurs, non-profit organizations and government leaders.
- Opportunity to market assistance and investment programs to a large audience.

#### Benefits of Sponsorship:

- Company logo printed on the inside cover of the guide.
- Exposure to 1,000s of businesses, organizations and government leaders through distribution of the guide.

#### Benefits of Advertisement:

- Half-to-full-page detailed ads available to market your company or organization.
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#### To advertise, sponsor or be included in the guide, please contact:

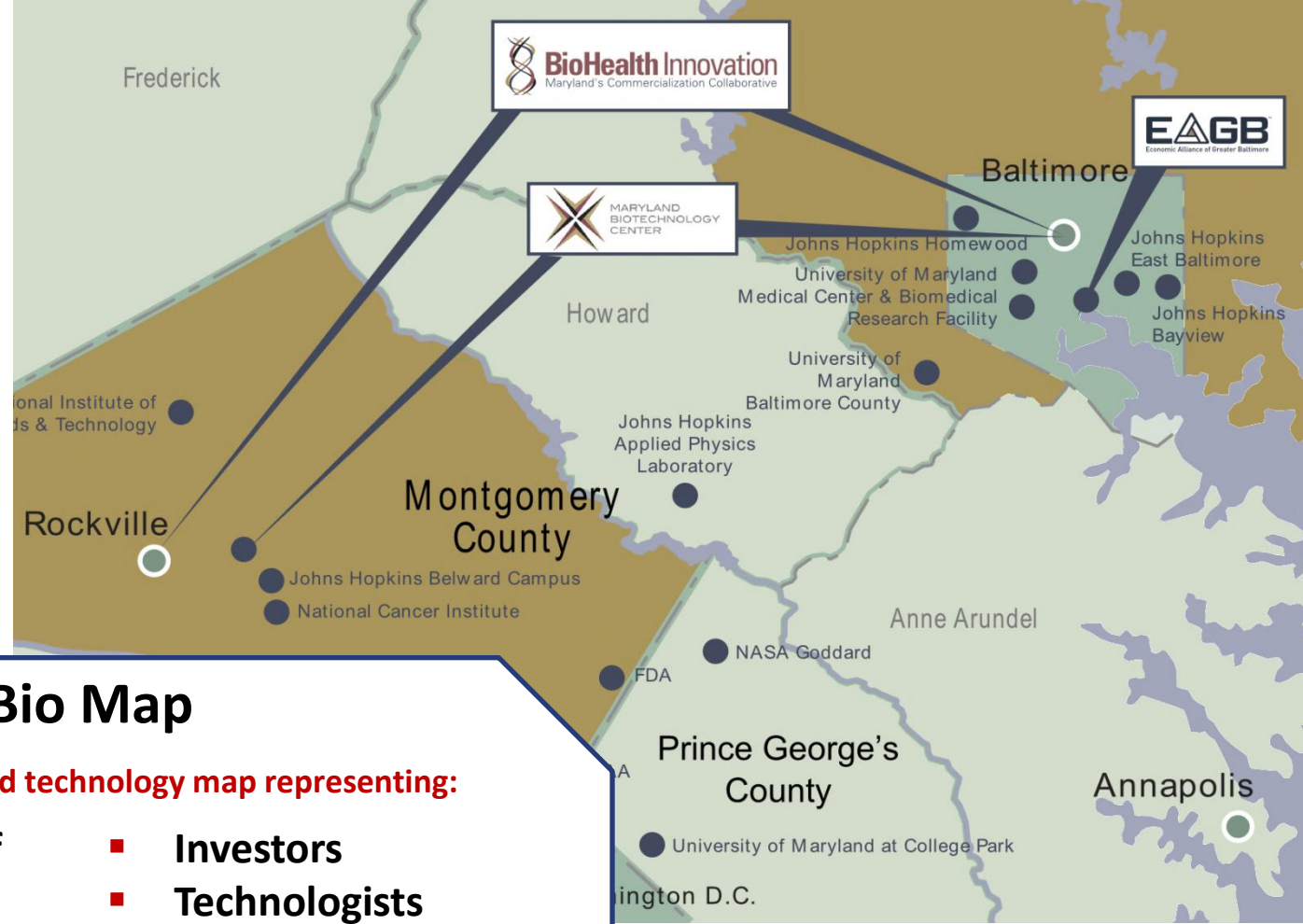
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Central Maryland Biohealth Entrepreneur’s Resource and Finance Guide is a joint effort between BioHealth Innovation and the Economic Alliance of Greater Baltimore.

**For more information, visit:**

[www.biohealthinnovation.org](http://www.biohealthinnovation.org)  
[www.greaterbaltimore.org](http://www.greaterbaltimore.org)



## Central Maryland Bio Map

**Interactive bioscience and technology map representing:**

- **Communities of entrepreneurs**
- **Academia**
- **Researchers**
- **Government**
- **Investors**
- **Technologists**
- **Seasoned industry leaders**

The map is a platform for collaboration and economic growth as individuals from inside (as well as outside) of the community are able to participate in the benefits.

# How is Success Measured?

## BHI Metrics – First 5 Years

	Now	In 5 Years
VC Funding for Biotech	\$79 Million	\$150
Government Funding for Biotech	Increased SBIR proposals & success	Improve Maryland's ranking
Source Prospective Deals Annually	30	150

Improve return on R&D investment by leveraging equity investment

Create and retain 1,300 jobs

Recruit entrepreneurs, experienced managers and businesses

Commercialize biohealth technologies and create biohealth companies

# BHI: The Triple Bottom Line

**Grows** high-paying jobs and businesses

**Expands** tax base; **improves** economic vitality

...and **Benefits** human health!



# BHI and Prince George's County

**LET'S FIND A WAY  
TO WORK  
TOGETHER!**

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