

Creating a Vibrant Regional Innovation Ecosystem

9/19/2012 Leuven & Genk, Belgium

Rich Bendis

President & CEO

BioHealth Innovation, Inc.

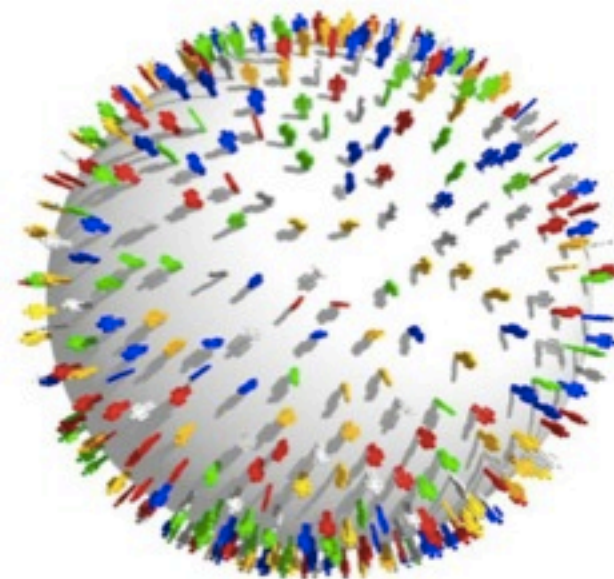
Innovation America

Bill Gates - Microsoft

“Never before in history has innovation offered promise of so much to so many in so short a time.”



The World According to Friedman: Hot, Flat, and Crowded



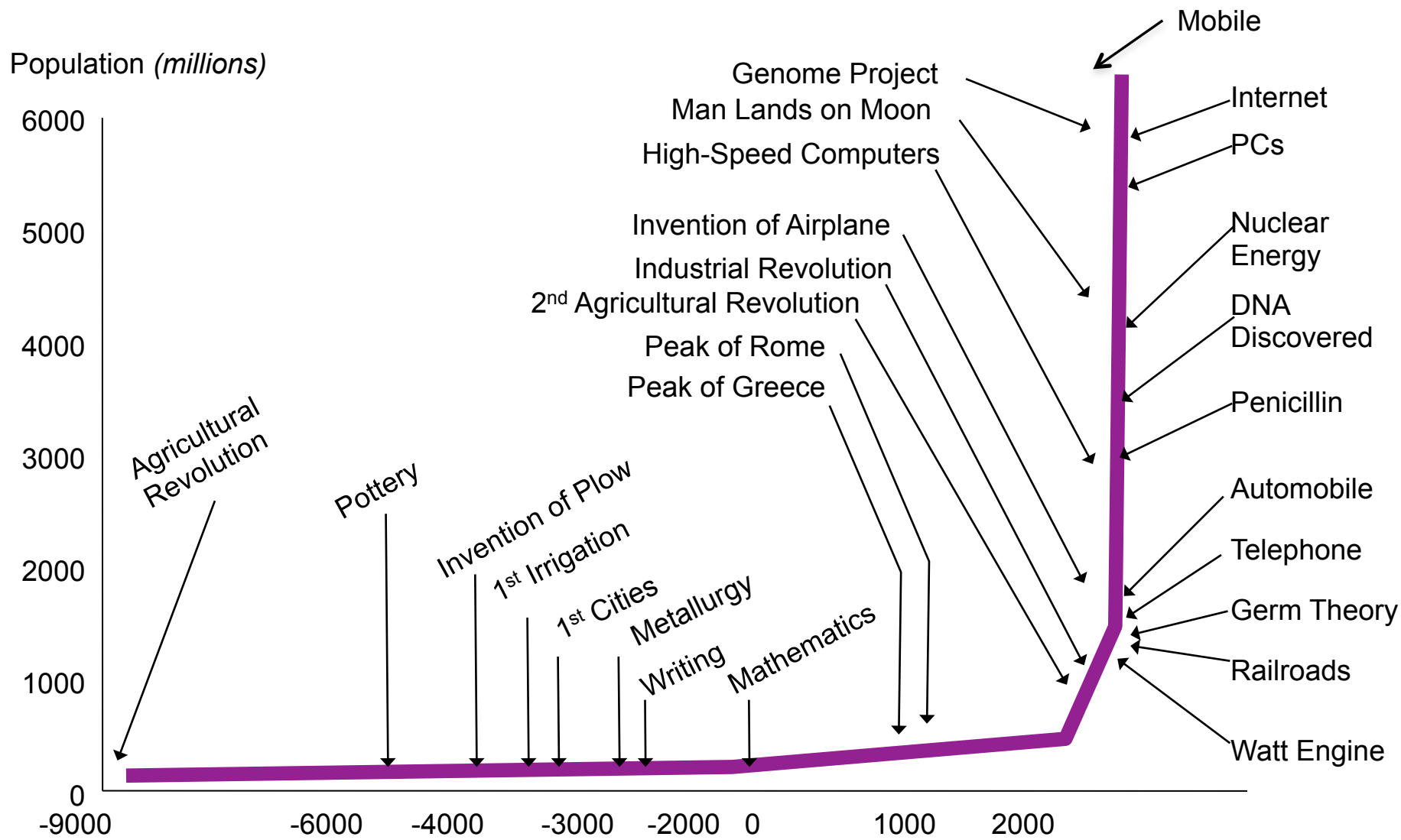
The Global Innovation Imperative

- Innovation is Key to Growing and Maintaining a Country's **Competitive** Position in the Global Economy and to address Global Challenges
- **Collaboration** among Small and Large Businesses, Universities, and Research Institutes is Essential for Innovation & Commercialization
- **New Institutions and New Incentives**, are increasingly important to support collaboration and foster innovation
- Competitive advantages are increasingly tied to human capital and innovation
- **Economic growth** is closely related to education/workforce, energy, climate change, environmental, natural resource, geopolitical issues & entrepreneurship



**OPEN
INNOVATION
MATTERS**

Growth of World Population and the History of Technology



Source: Milken Institute, Robert Fogel/University of Chicago

Why Is Innovation Essential?

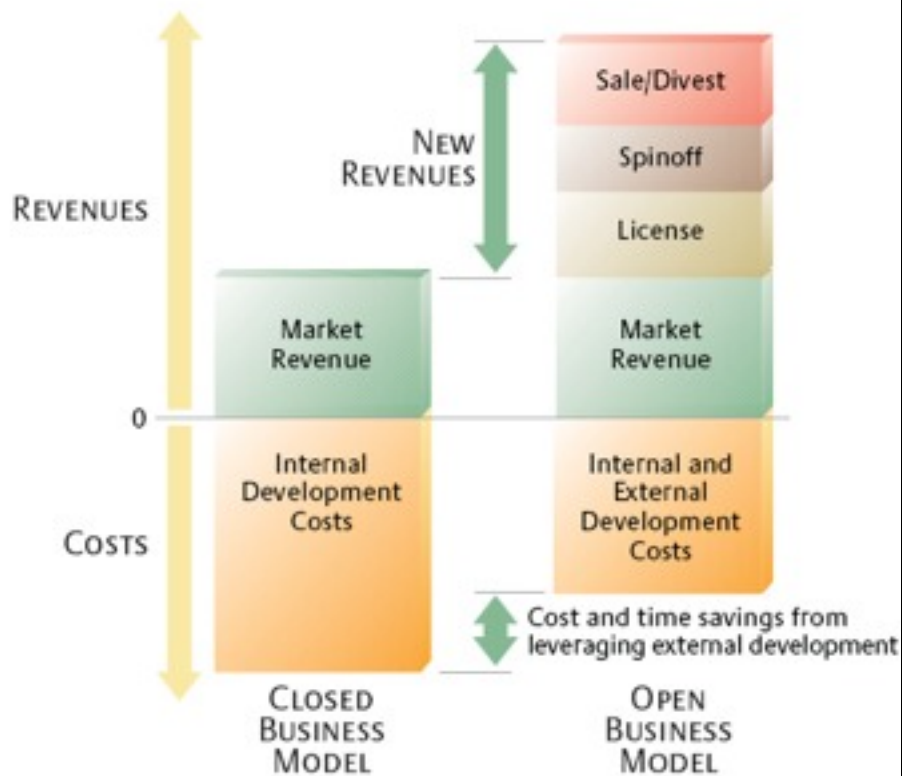


***“INNOVATION
DISTINGUISHES
BETWEEN A LEADER
AND A FOLLOWER.”***

- STEVE JOBS

INNOVATION is the creation and transformation of knowledge into new products, processes, and services that meet market need.....and interactions, entertainment forms, and ways of communicating and collaborating

OPEN INNOVATION!



1,2 H.Chesbrough, 2003

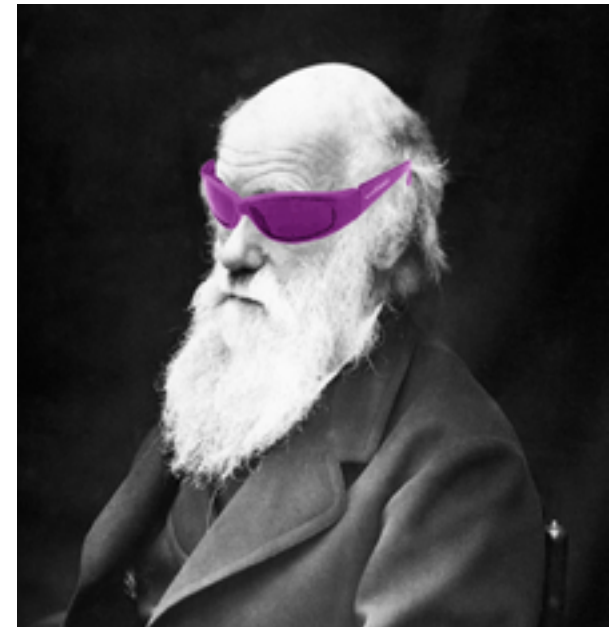
Open Innovation means that valuable ideas can come from inside or outside the company (industry) and can go to market from inside or outside the company (industry) as well¹.

This approach places external ideas and external path to market on the same level of importance as that reserved for internal ideas and paths

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



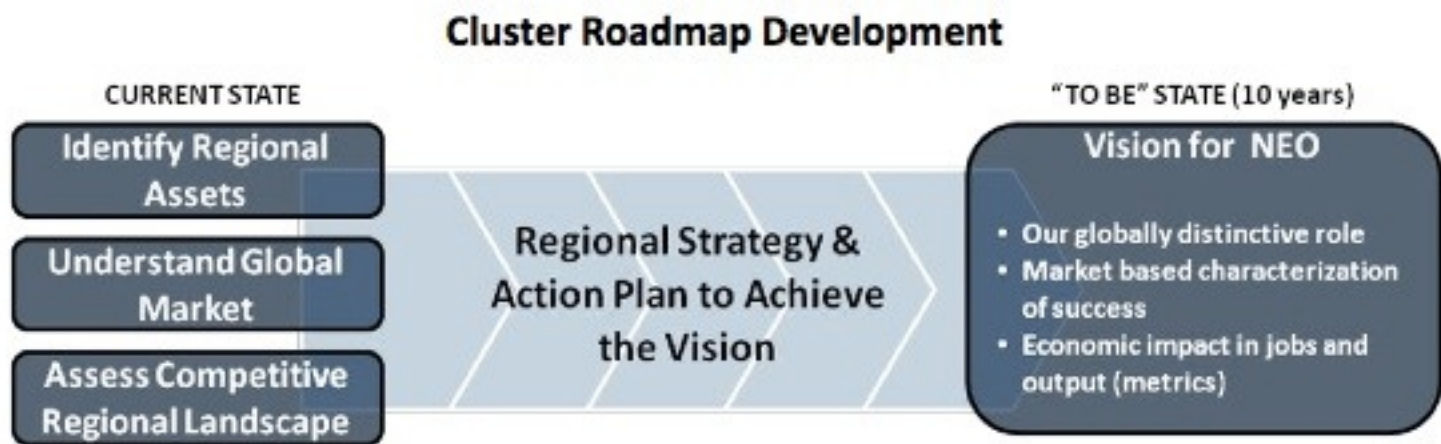
The Six Driving Forces of Change

- Commoditization
- The Digital Revolution
- Social Mediaization throughout society
- Global Open Innovation
- The Turbulent World
- Acceleration (or running faster to stay in the same place)



What Is A Road Map....Why Is It Needed?

- A roadmap answers the **question** “*Where do we want to be and how to we get there?*”
- A cluster roadmap **provides strategies and action** plans to best **achieve a vision of the future shared by a critical mass** of industry-related organizations.
- The strategies and action plans are developed according to the unique strengths of the cluster and region as compared to a global market opportunity.



Regional Innovation Clusters

Five Key Components to Consider When Defining Unique

What you make, including your existing & prospective industry clusters

**ECONOMIC
BASE**

**ENTRE-
PRENEURSHIP**

Your capacity to create companies wholly new or from existing firms

What you do: your workforce skills & human capital base

TALENT

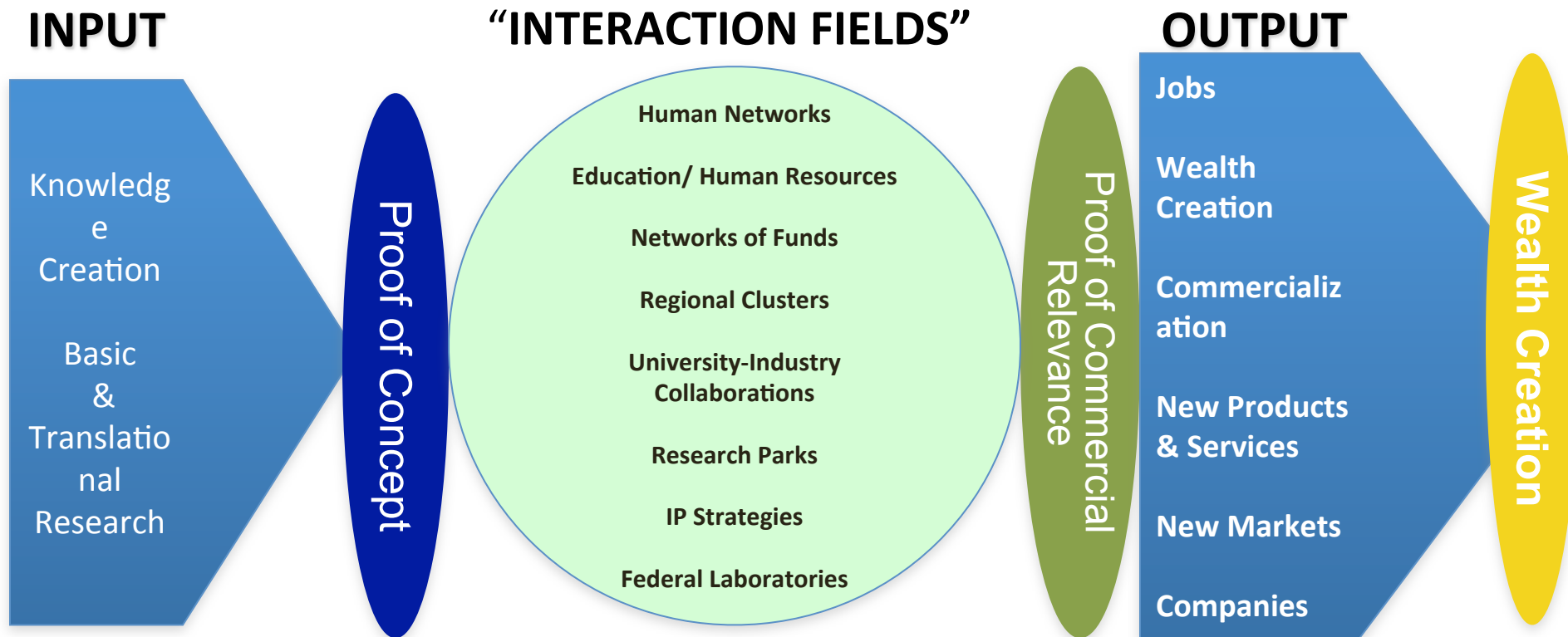
**INNOVATION
& IDEAS**

Your capacity to innovate and generate new ideas

**Location, Infrastructure, Amenities,
Factor Costs, Natural Resources**

The basic conditions defining the economic milieu of the region

Innovation Ecosystem



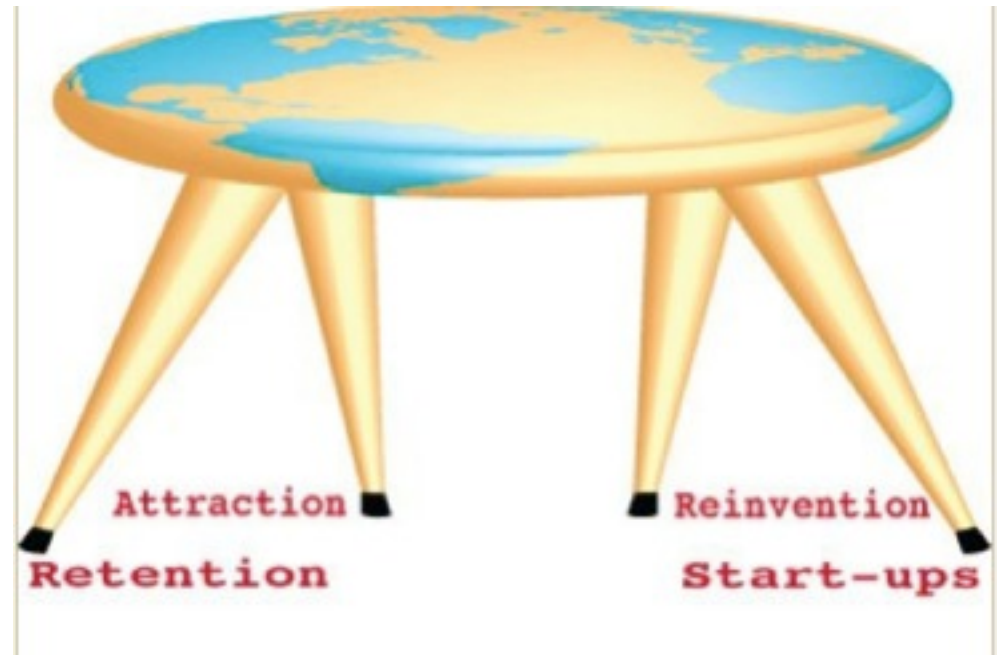
The concept of the **Innovation Ecosystem** stresses that the flow of technology and information among people, enterprises and institutions is key to a vibrant innovation process.

Regional BioHealth Ecosystem Partners



Economic Development

- Economic Development is like a 4 - legged stool:
 - **Attraction**
 - **Retention**
 - **REINVENTION**
 - **Grow Your Own**
- IBED requires patience and persistence, continuity and consistency
- Working with early-stage companies takes time
- A balanced portfolio economic development strategy is best!



Implementing a New Innovation Paradigm

- Deviate from traditional perspectives
- Encourage public investment and risk taking
- Develop trust through collaboration
- Ensuring responsiveness to partners' missions
- Build consensus of all constituents through education, participation, and positive outcomes
- Move from Tech-Based Economic Development (TBED) to.....



Innovation-Based Economic Development (IBED)

Convergence of Traditional Eco Devo & IBED

Traditional

Innovation

Assets:

PHYSICAL

KNOWLEDGE

Competitive Basis:

Natural resources
Highways / Rail
Proximity
Costs



Specialized talent
Networks, Clusters,
University research
Industry partnerships
Commercialization, Market
Positioning Globalization

Key values/offerings:

University Research
Parks
Incentives



Research Parks
Workforce competencies
Lifestyle

Lead Organization:

Chambers /
EDCs



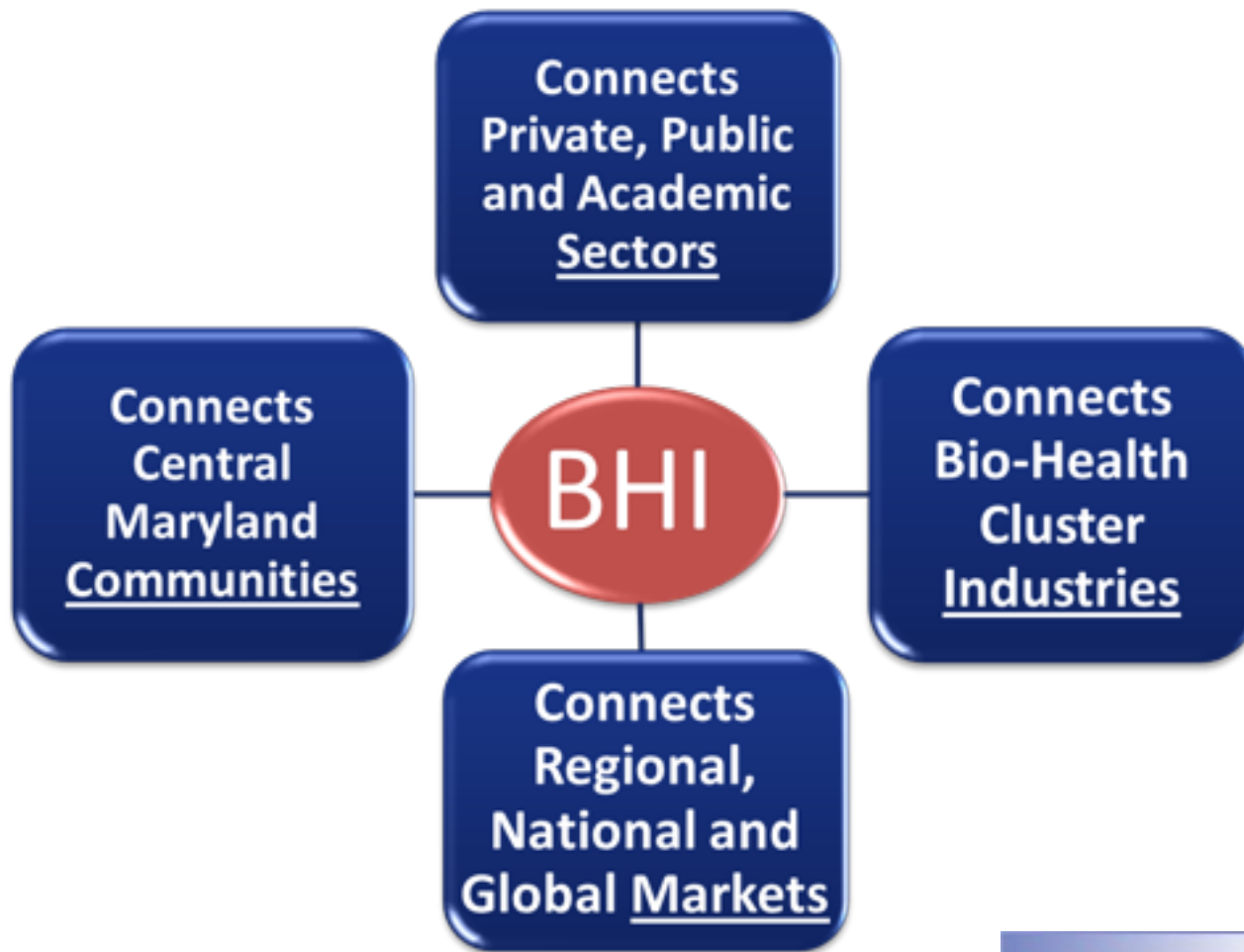
Economic developers

**INNOVATION
INTERMEDIARIES**

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





Intermediary Best Practices

- Longevity
- Bipartisan Support & Champions
- Independent Organizations
- Continuous Reinvention
- PRIVATE SECTOR LEADERSHIP
- Understand Return On Investment
- Sustainability In Funding
- Accountable
- Innovative
- Effective Leadership



US Regional IBED Intermediaries



Northeast Ohio IBED Intermediaries



NorTech, (the Northeast Ohio Technology Coalition) is a nonprofit Technology-Based Economic Development (TBED) organization that champions growth in Northeast Ohio's 21 county region. Foundation funded.



JumpStart is creating economic transformation in Northeast Ohio by providing resources to entrepreneurs to grow their high potential, early stage companies.



BioEnterprise is a business formation, recruitment, and acceleration initiative designed to grow health care companies and commercialize bioscience technologies



Team NEO advances Northeast Ohio's economy by attracting businesses worldwide to the 16-county Cleveland Plus region.



Cleveland Clinic Innovations advances commercial oriented innovation and transforms promising therapies, devices and diagnostics into products by creating spin-off companies, licensing to established companies and enabling equity partnerships.



An Ohio Advanced Manufacturing Cluster



Flexible electronics is a new science and manufacturing opportunity for printing electronic devices on flexible plastic materials. The flexible electronics industry is driven by the global demand for electronic products to get smaller, lighter and consume less power.



The Problem--A National Challenge

America is falling behind the world it invented because we are:

- **Out-educated**
- **Out-built in infrastructure**
- **Out-invested in R&D**

by countries in both Europe and Asia.

--*“That Used to Be Us”* by Thomas Friedman, 2011

The Reverse Brain Drain

- ***“Opportunities in China Lure Scientists Home”*** --The Washington Post, February 20, 2008
- American returnees to India cited as reasons for going “back” to where they came from:
 - ***Better Economic Opportunities***
 - ***Family Ties***
 - ***Better Access to Markets***



Alignment of National, State, and Regional Policies



**Obama
Administration**



**Governor
O'Malley
(Maryland)**



**County Executive
Ike Leggett
Montgomery County**

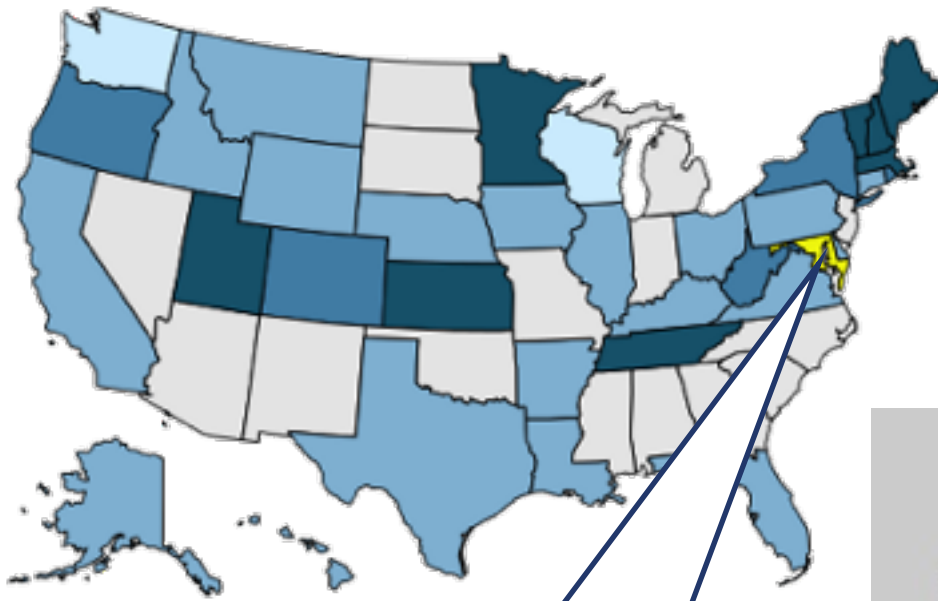


**Stephanie Rawlings -
Blake
Mayor of Baltimore**

- Link Both State, County & City Strategies to Obama Administration Objectives
- Develop an integrated Regional BioHealth Economic Development and Transit Strategy
- Present the “Regional Job Generating BioHealth and Transit Plan” to the White House & partner with federal agencies and other stakeholder organizations as a “Showcase Model.”
- Develop structure & governance for the regional BioHealth innovation intermediary
- Obtain Priority Federal Funding for Region’s BioHealth Industry-Federal Labs-University Innovation Intermediary Pilot Plan
- Obtain Priority Federal Funding for the region’s Innovative “State of the Art” Comprehensive Rapid Transit Vehicle Plan (CCT et al)
- Develop a pilot BioHealth-Regional Innovation Cluster (H-RIC) program

Maryland

Population:
5.828 million people



“The Region”--Central Maryland



State of Maryland: Federal Resources

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



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

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

BioHealth Regional Innovation Cluster Assets



National Biodefense Analysis and Countermeasures Center



J. Craig Venter INSTITUTE



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 a STEM Workforce

BHI Value Proposition

- Connects regional innovation assets
- Develops an entrepreneurial talent and support pipeline
- Attracts funding for technology commercialization
- Develops a continuum of innovation workforce

BHI Board of Directors



Michael J. Baader, Esq.
Managing Director, Venable LLP



Richard Bendis
President & CEO, BioHealth Innovation, Inc.



Scott Carmer (Chair)
Executive Vice President of
Commercial Operations, MedImmune



Kenneth Carter
Chair, Noble Life Sciences



Scott Dagenais
Senior Vice President, M&T Bank



Ronald J. Daniels
President, Johns Hopkins University



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Regional Managing Principal, Cassidy Turley



Douglas Liu
Senior Vice President of Global Operations, Qiagen



David Mott
General Partner, New Enterprise Associates



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Public Policy, Human Genome Sciences



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J. Thomas Sadowski
President & CEO, Economic Alliance of Greater
Baltimore



Thomas Street
Assistant Chief Administrative Officer, Montgomery
County Government



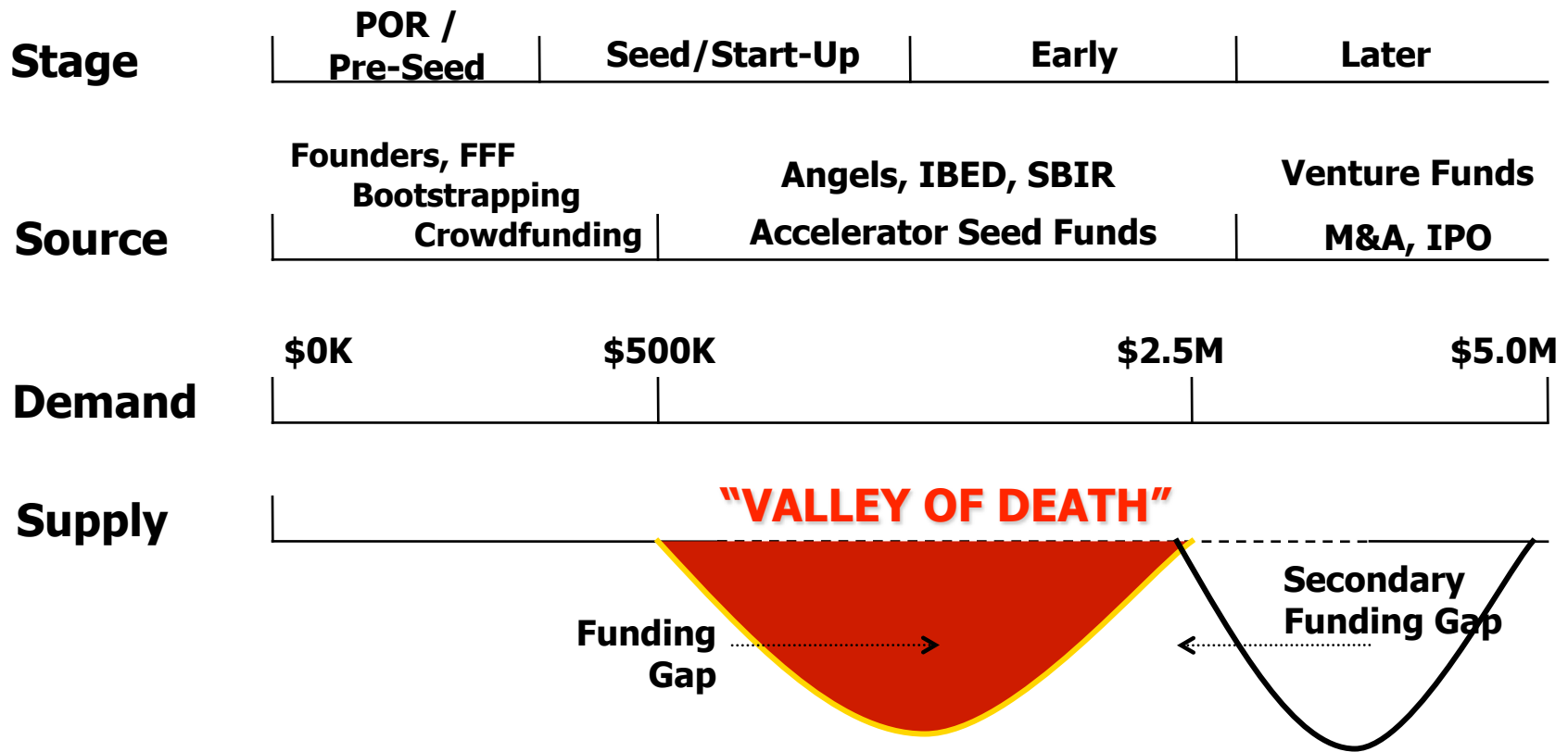
BHI/EIR Technology Focus

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



Innovation Capital Valley of Death

“VALLEY OF DEATH”



Innovation Paradigm Shift

**PROOF OF CONCEPT
(Technological Feasibility)
“It Works!”**



The Historic  Garage

invent

**PROOF OF COMMERCIAL RELEVANCE
(Market Pull)
“I’ll Buy It!”**



CASH IS KING!

Innovation Funding Continuum

DREAM	CONCEPT	APPLIED	COMMERCIAL RELEVANCE	STARTUP	ROLL OUT	GROWTH
<p>FoundersFFF Bootstrapping Crowdfunding</p>       	<p>Seed</p>      	<p>Incubators/ Accelerators</p>     	<p>IBED</p>     	<p>Federal State Regional</p>       	<p>ANGEL</p>      	<p>VC</p>     

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"> NIH R01 NIH R03 NIH R21 Small Business Technology Transfer Research Grant (STTR) Phase I Innovate Maryland 	<ul style="list-style-type: none"> NIH Center for Accelerated Innovations (CAI) NCATS Cures Acceleration Network (CAN) Small Business Innovation Research Grant (SBIR) Phase I Maryland Stem Cell Research Fund (MSCRF) TEDCO University Technology Development Fund (UTDF) TEDCO TechStart Maryland Biotechnology Center's Translational Research Award 	<ul style="list-style-type: none"> Maryland Industrial Partnerships (MIPS @ UMD) Maryland Biotechnology Center's Biotechnology Commercialization Awards TEDCO Maryland Technology Transfer and Commercialization Fund (MTTCF) BHI SBIR/STTR Commercial Relevance BHI Commercial Relevance Fund (CRF) 	<ul style="list-style-type: none"> Dingman Center Angels (JMD) TEDCO Johnson & Johnson Joint Investment Program Propel Baltimore Fund SBIR / STTR Phase II BHI Central Maryland Angel Fund National Association of Seed & Venture Funds (NASVF) Angel Capital Association (ACA) 	<ul style="list-style-type: none"> Maryland Health Care Product Development Corporation (MHCPDC) Invest Maryland: Maryland Venture 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 National Venture Capital Association (NVCA)

- Association of University Resource Parks (AURP)
- Association of University Technology Managers (AUTM)
- Licensing Executive Society (LES)

Funding Type Key

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

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

- New Enterprise Associates (NEA)
- TDF
- Abell Venture Fund
- MMG Ventures LP
- Mid-Atlantic Venture Association (MAVA)



Jobs! Jobs! Jobs!

Does Seed Investing REALLY Create Jobs?



Public Investment In Job Creation

Category	CDVCA*	State of PA	State of MI	State of UTAH	Stimulus Bill*
Funds Invested	\$26M	\$90M	\$291M	\$60M	\$728.9B
Jobs Created	3,700	8,150	28,854	2,047	400,803
\$ Per Job Invested	\$7,100	\$11,000	\$11,728	\$29,300	\$1,818,000

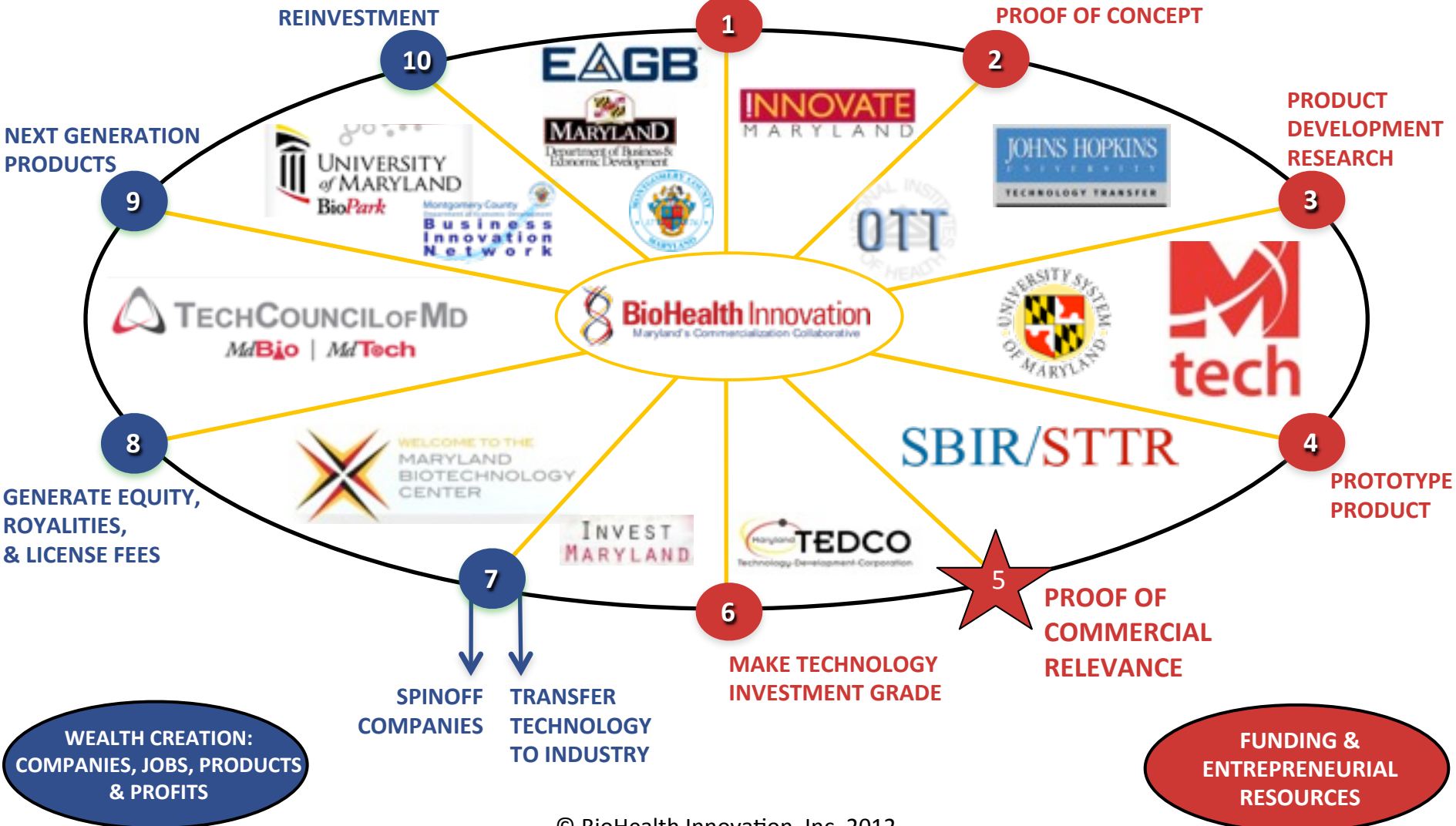
*Community Development Venture Capital Alliance

** Source: Recovery.gov 2011

BHI Commercialization Model

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

PUBLICATIONS
PhD's
TENURE
PATENTS



BHI Deal Goals

VC Regional History:

Last decade the region: ***\$79.8 million per year****
in biotechnology venture financing (2003-2010).

Goal:

150 prospective deals annually

Fund:

25% or 35 deals per year

Avg. Investment:

\$4.3 million per start-up

Targeted VC Annual Investment

\$150,000,000

*This includes an estimated \$57.7 million per year in Montgomery County, and \$22.1 million per year in the rest of the state.

SEED
CAPITAL



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 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.

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



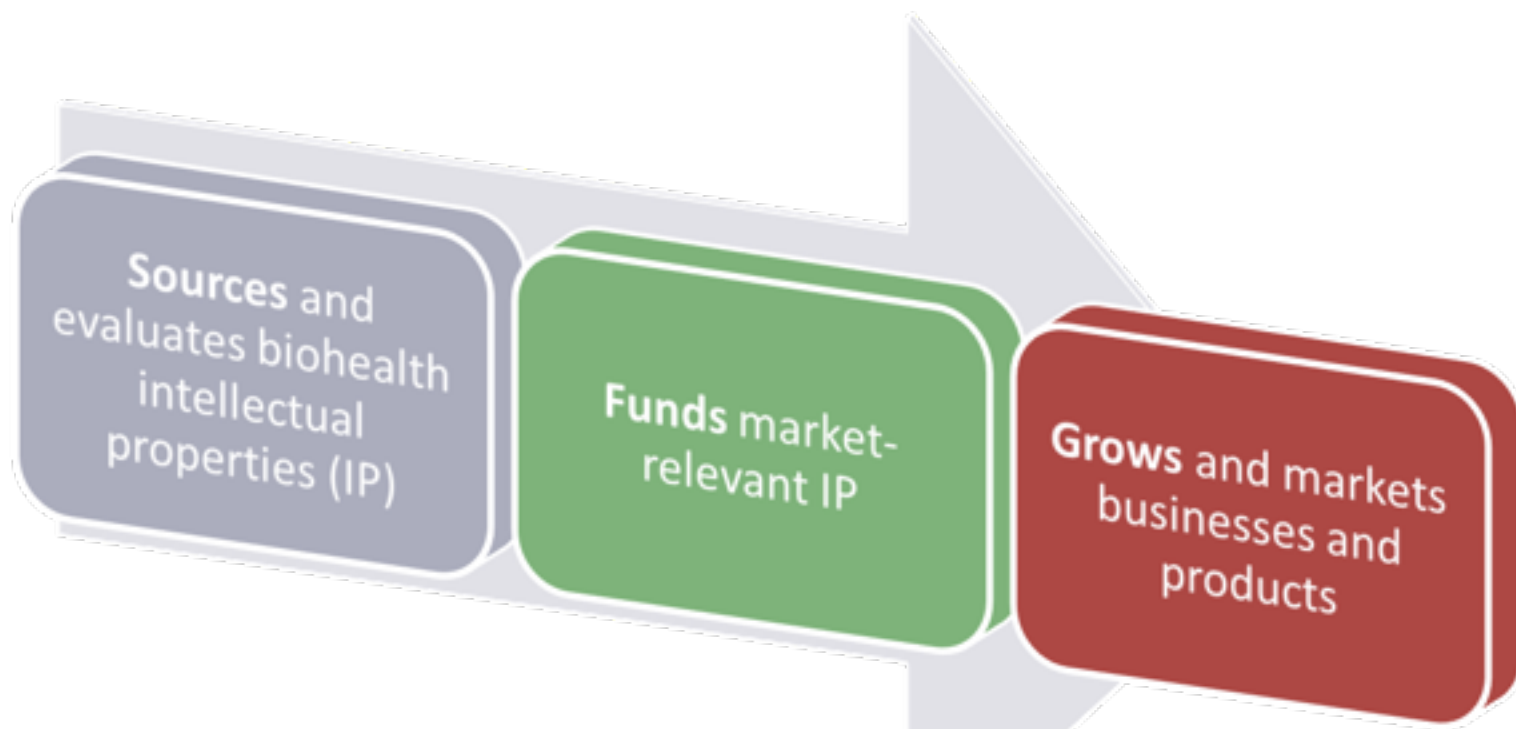
Todd Chappell

Progress (3 ½ months into Program)

- 55 Innovations identified and initially screened
- 7 Progressed to Secondary Analysis in BHI Pipeline (Safety & Efficacy Profiling, IP Diligence, Regulatory & Development Pathways)
- 26 No BHI Interest, 22 still Under Review
- Goal to fund the operation of more EIRs

How does **BHI** work?

Commercialization Pipeline



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



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.**



<p>Benefits of Inclusion:</p> <ul style="list-style-type: none"> • Exposure to businesses, entrepreneurs, non-profit organizations and government leaders. • Opportunity to market assistance and investment programs to a large audience. 	<p>Benefits of Sponsorship:</p> <ul style="list-style-type: none"> • 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. 	<p>Benefits of Advertisement:</p> <ul style="list-style-type: none"> • Half-to-full-page detailed ads available to market your company or organization. • Exposure to 1,000s of businesses, organizations and government leaders through distribution of the guide.
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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
www.greaterbaltimore.org

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.

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!

What Should We Do To Grow Our Region?

- Think Globally – Act Locally
- Targeted Cluster Innovation
- Practice Collaborative Capitalism
- Build Upon Assets & Fill Gaps
- Grow Private-Public Partnerships
- Fully Engage Private-Sector
- Support Startups Growth into SME's & Mid-Size Companies



Henry Ford

"Coming together is a beginning, staying together is progress, and working together is success." –

Henry Ford



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