

# HIT in Action: A Maryland Perspective

Richard Bendis  
President & CEO  
BioHealth Innovation, Inc.

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**HIMSS**  
Maryland Chapter



transforming healthcare through IT™

# HIMSS 2014 Legislative Talking Points

1. Expand the availability of telemedicine for patient care
2. Continue to support CRISP HIE services expansion
3. Ensure consumer privacy and security
  - Support harmonization of regulations between neighboring jurisdictions
  - Support efforts to develop a consistent nationwide patient data matching strategy

# Maryland's Triple Aim Roadmap

Reduce Costs | Enhance Quality and Experience | Improve Health

- Limit hospital per capita spending to an annual growth cap of 3.58%
- Reduce total Medicare hospital spending by \$330M over five years
- Limit total growth in Medicare spending per beneficiary to no more than national growth
- Reduce the readmissions rate to the national average within five years
- Reduce infections and other hospital-acquired conditions by 30 percent within five years

# 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



# The Region — Central Maryland

- Unrivaled Research Assets -
- Unfulfilled Commercial Promise -



National Institutes  
of Health



# Maryland

Carroll

Harford

Baltimore County

National Cancer Institute  
Fort Detrick/  
Medical Facilities

Frederick



## BioHealth Innovation

Maryland's Commercialization Collaborative



Frederick

Center for Medicare  
and Medicaid Innovation

Baltimore

Johns Hopkins Homewood

Johns Hopkins  
East Baltimore

University of Maryland  
Medical Center & Biomedical  
Research Facility

Johns Hopkins  
Bayview

University of  
Maryland  
Baltimore County



Howard

Johns Hopkins  
Applied Physics  
Laboratory

US Dept  
of Energy

## Montgomery County

National Institute of  
Standards & Technology

The Universities at  
Shady Grove

Johns Hopkins Belward Campus

National Cancer Institute

Rockville

US Dept of  
Health & Human  
Services

FDA

NASA Goddard

National Institutes of Health

Walter Reed Army  
Institute of Research

NOAA

USDA National  
Agriculture Library

Uniformed Services University of the Health Sciences

HHS

University of Maryland at College Park

Anne Arundel

Annapolis

Virginia

Washington D.C.

US Dept of Defense  
(Pentagon)

Prince George's

# What is A Regional Innovation Intermediary?

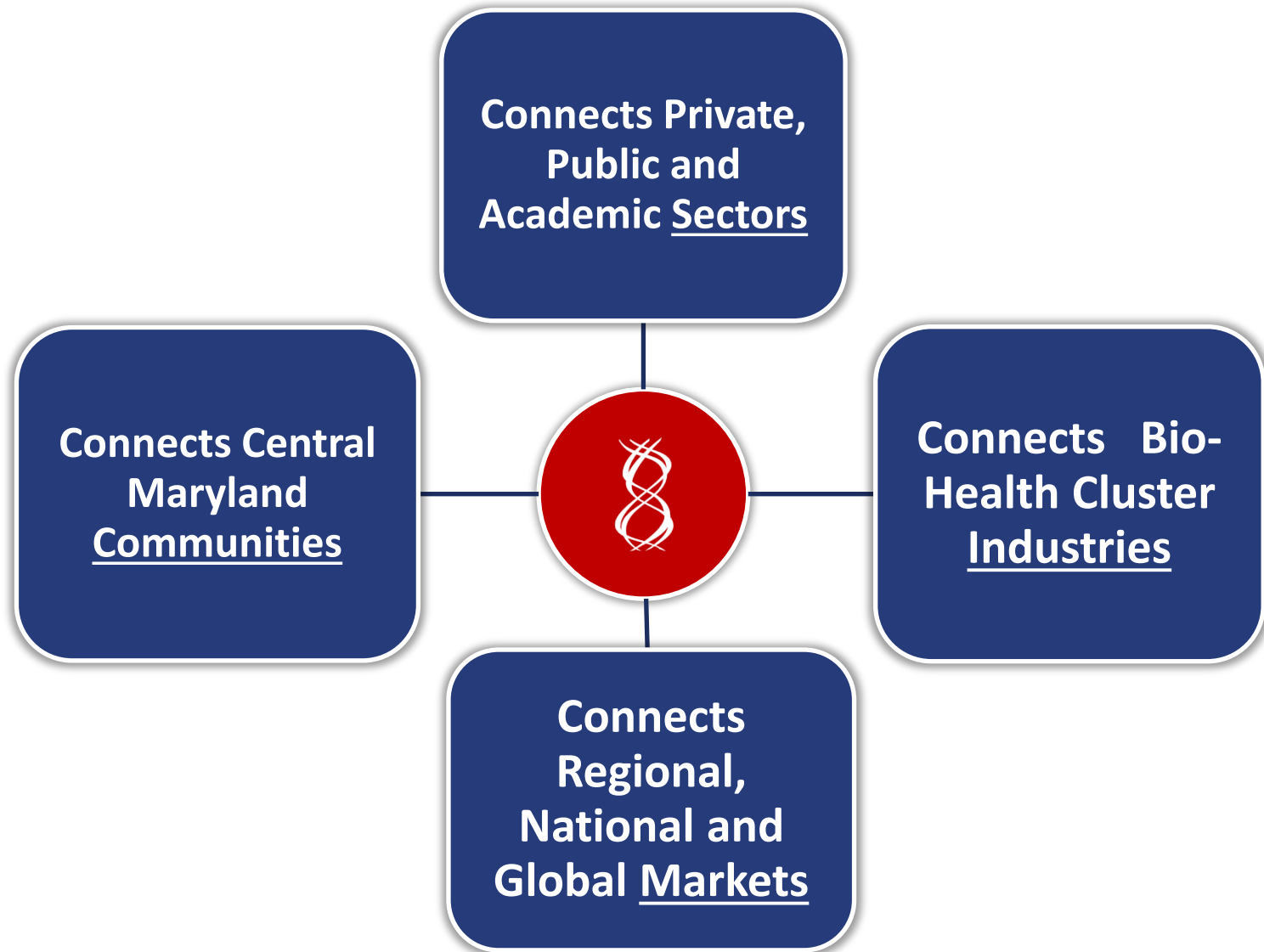
An organization at the center of the Central Maryland region's efforts to:

- 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





# BHI Partners and Sponsors

## Private Sector



## Government



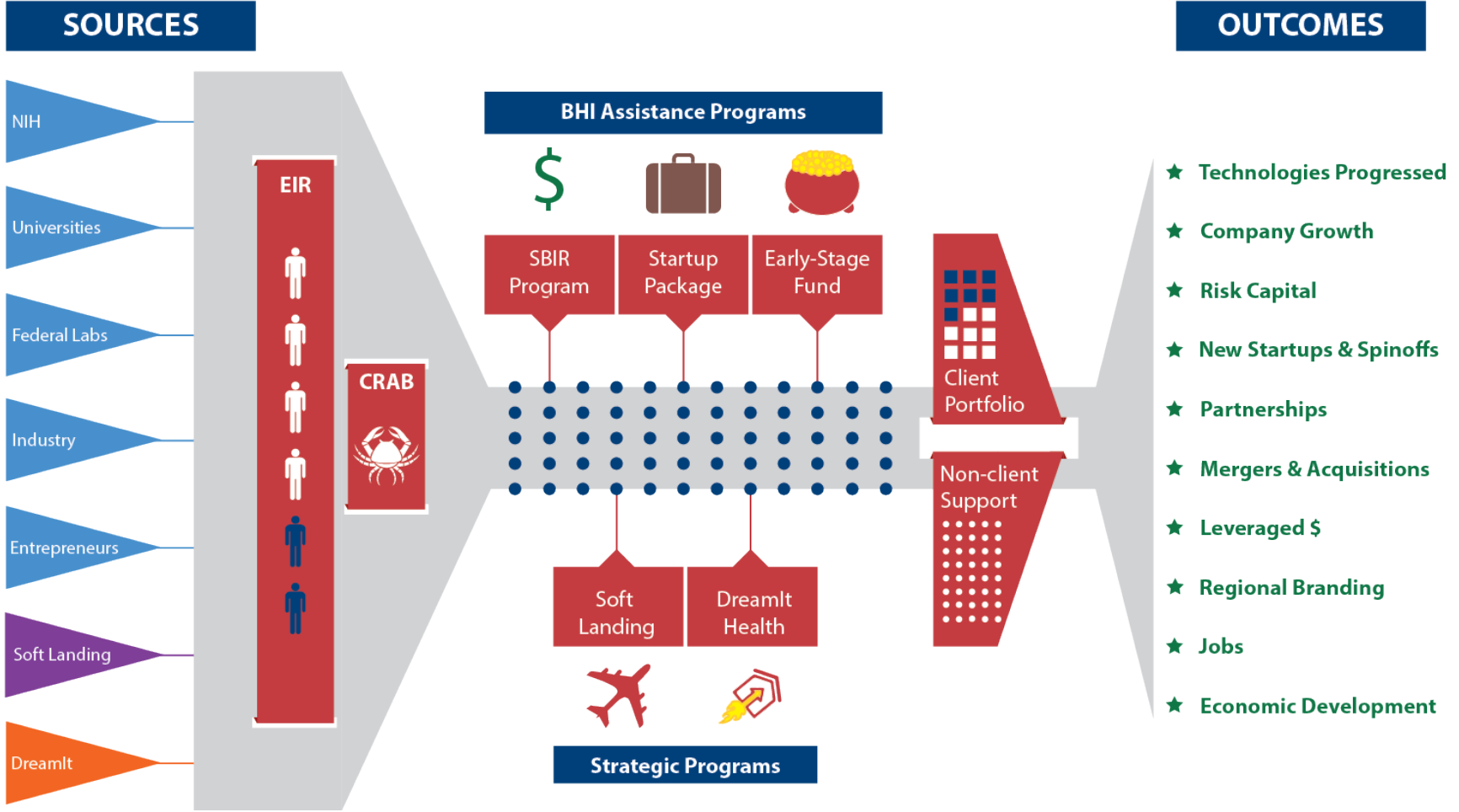
## Academia



## Non-Governmental



# BHI Program Structure



## Financial Sponsors

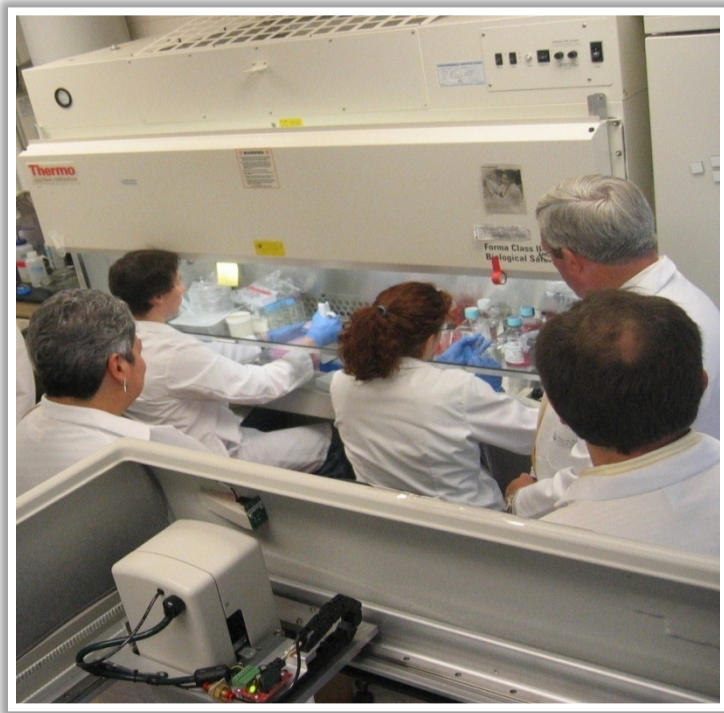


# Innovation Paradigm Shift

PROOF OF CONCEPT  
(Technological Feasibility)

Laboratory Push

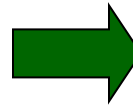
**“It Works!”**



PROOF OF COMMERCIAL RELEVANCE  
(Market Pull)

**“It Works To Solve A Problem”**

**“I’ll Buy It”**



# BHI Technology Focus

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



# Partnership Intermediary 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.



**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.

# BHI Entrepreneurs-in-Residence



**Todd Chappell (NIH-OTT)**

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.



**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.



**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.



**Rich Moore (NIH-OTT)**

Dr. Moore previously served as the Chief Scientific Officer for OpGen, Inc. In that role, Dr. Moore provided leadership over multiple R&D functions, and led the company's Scientific and Clinical Advisory Boards. Prior to that, he spent 12 years at BD Diagnostics holding various positions, most recently as R&D Director, Systems Integration and Advanced Technology.

# BHI Client Companies

**BeneVir**

- Developing a therapeutic platform that can be adapted to target a wide variety of cancers.



- Specializes in automatically diagnosing medical conditions in medical scans, tests, and sensors with minimal human support.



- Developing and marketing Organ-on-a-Chip solutions for the pharmaceutical industry.

**Mehr Medical**

- Developing devices for cardiovascular procedures that will solve high unmet needs in the transcatheter valve replacement space.

**MockV**

- Developing novel viral clearance kits to be utilized during process development bio therapeutics.



- Developing sensors that can detect harmful chemicals mixed in air in very small quantities, such as industrial chemicals, and other pollutants.



- Developing medical devices related to image-guided, minimally-invasive niche markets.



- Developing a platform vaccine like particle technology that has the potential to be used for various diseases including cancer.

# US Venture Capital Investment

2007

**4,211**

Deals

**\$31.9 billion**

Investment

**\$5.4 million**

Average Deal Size

**410**

Active\* VC Firms

**40%**



2013

**2,505**

Deals

**\$21.1 billion**

Investment

**\$8.4 million**

Average Deal Size

**460**

Active\* VC Firms

**39%**



**35%**



**11%**



2013 Maryland

**71**

Deals

**\$663 million**

Investment

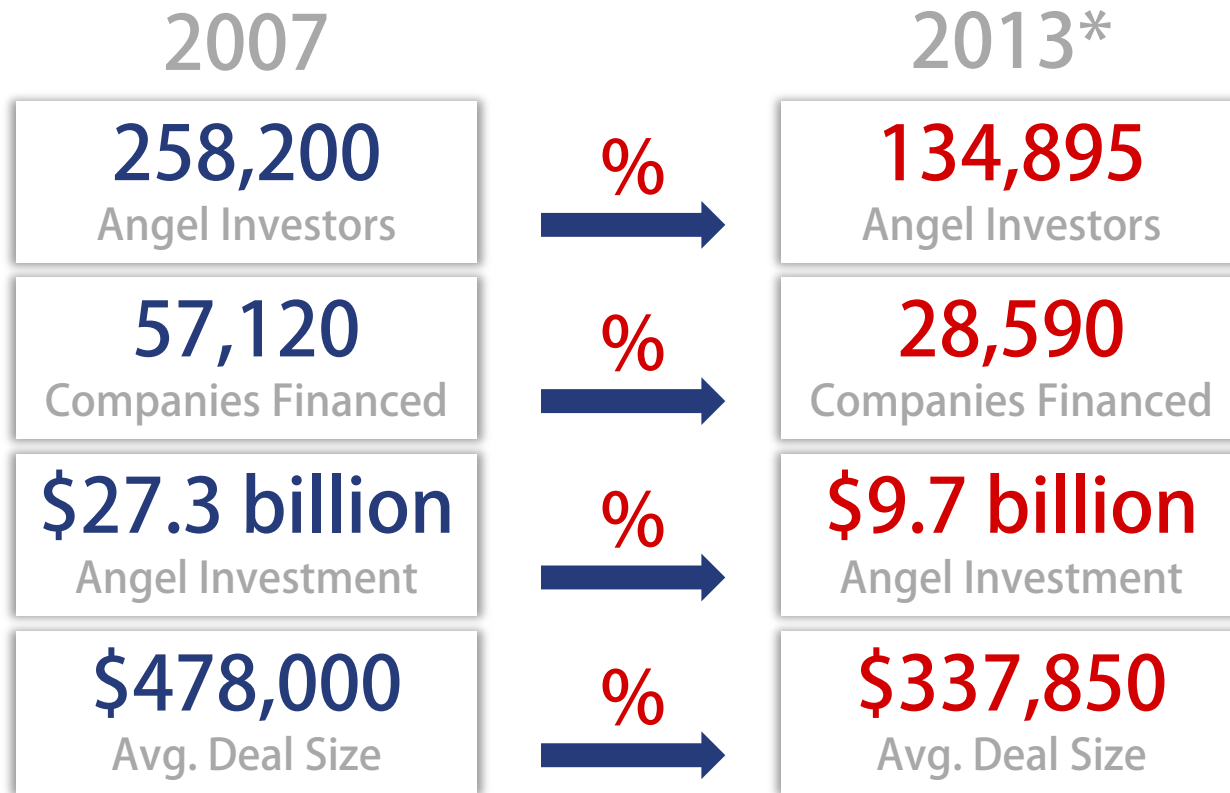
**\$9.3 million**

Average Deal Size

\*VC firms completing 4 or more deals per year

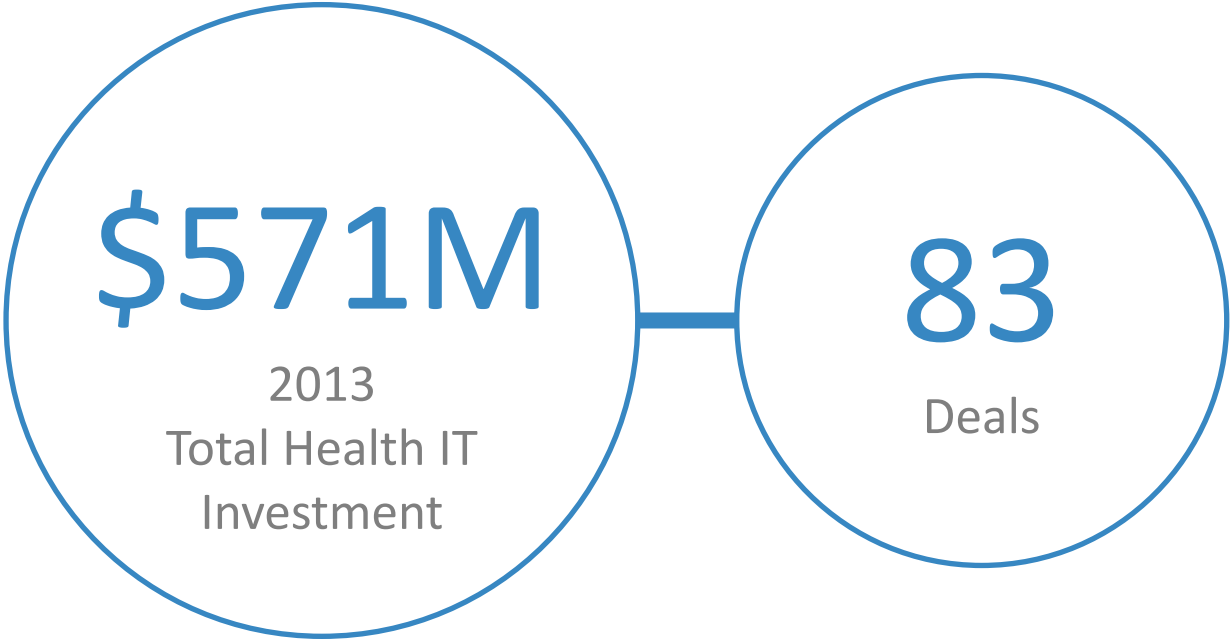


# US Angel Investment

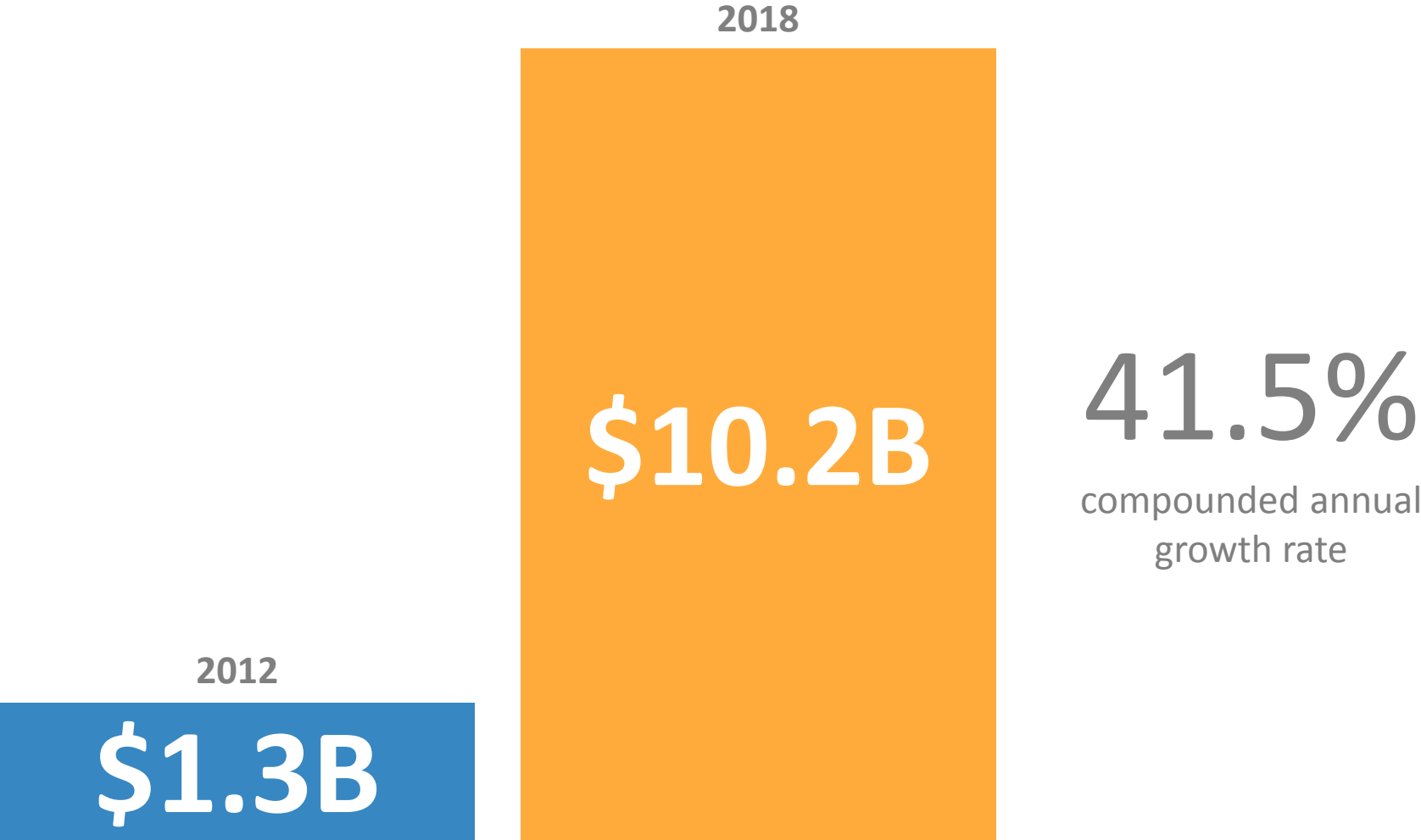


\*For Q1&Q2

# 2013 US VC Health IT Investment

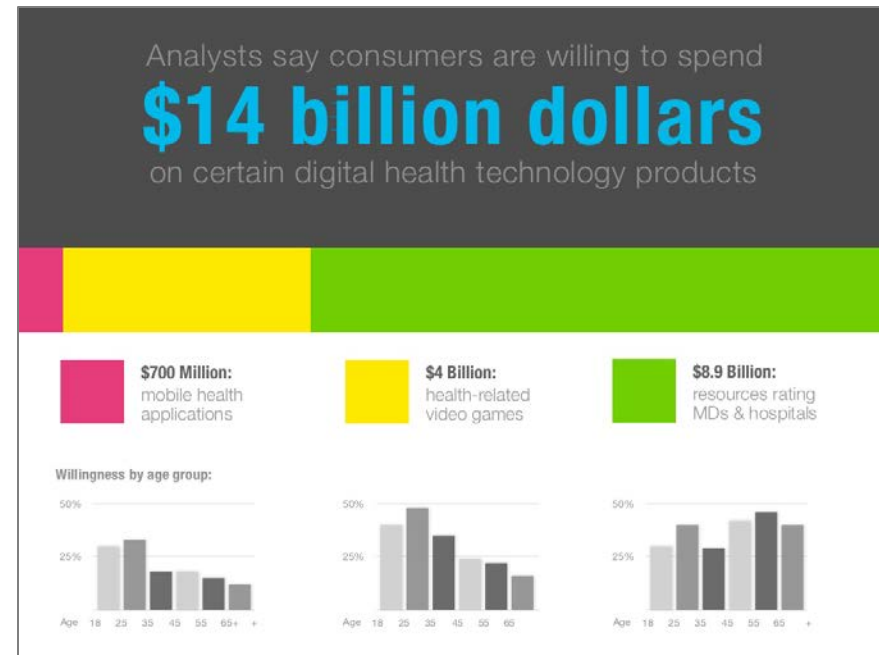


# Global mHealth Market Growth



# US Health IT Statistics

- 88% of physicians want patients to be able to monitor their health at home
- Analysts say Consumers are willing to spend **\$14B** on digital health
- # of adults using mobile phones for health info grew from 61M to 75M
- 90% of patients want to self-manage their healthcare



# Startup Statistics

- New business owners in 2012: 514,000
- Average founding team age: 35-44
- Avg. Funding per company: \$1.5M
- 75% of startups fail
- 90% of products fail
- 18% of entrepreneurs succeed in their first venture

# DreamIt Health Accelerator



120 Applications  
32 Semifinalists  
25 Finalists

9



- Help 9 companies achieve critical business milestones in 4 months
- Provide guidance from successful entrepreneurs
- Give companies the chance to tap into the region's wealth of federal healthcare institutions



- 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



# Participant Overview



**Phobious**  
www.phobious.com



THE  
SMARTPHONE  
PHYSICAL

Aegle



**Protenus**  
Moving Healthcare Forward



**Avhana<sup>+</sup>**



patient feed   
saving time. saving lives.





**Phobious**

[www.phobious.com](http://www.phobious.com)

Location  
Barcelona, Spain

Website  
[www.phobious.com](http://www.phobious.com)

Augmented  
Reality  
Treatment



Daniel Roig-Canelles



Xavier Palomer-Ripoll



Xavier Hernandez-Oromi



Antonio Amau-Blasco

**Phobious** is the first psychological treatment method to combine hyper-realistic RV, RA, and holophonic sound to create a controlled environment to help treat psychological problems from the comfort of one's home.

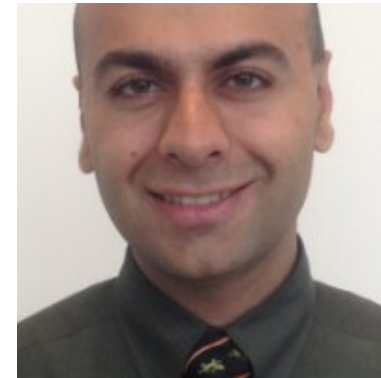


THE  
SMARTPHONE  
PHYSICAL

Location  
Baltimore, Maryland

Website  
[www.smartphonephysical.com](http://www.smartphonephysical.com)

Digital  
Workflow  
Management



Shiv Gaglani



Mike Baptista

The [Smartphone Physical](#) is focused on integrating smartphones and tablets under one platform. Creating a unified system to for mHealth devices will remove one of the main barriers that is currently stopping them from being clinically adopted.

Location  
Baltimore, Maryland

# Aegle

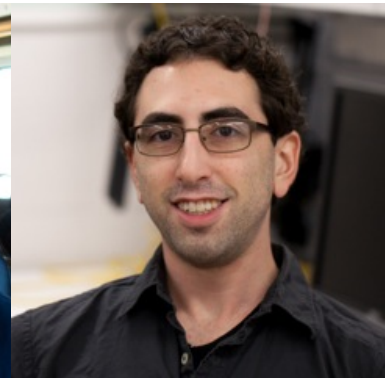
Wearable  
Biometric  
Devices



Krzysztof Sitko



George Chen



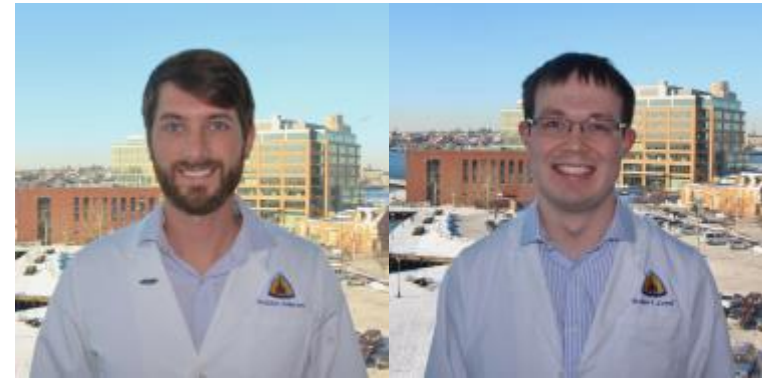
Justin Rubin

**Aegle** is a biometrics company that is building consumer wearable devices. It is currently developing a fitness product to provide real-time data to measure an athlete's endurance levels.

Location  
Baltimore, Maryland



Smart  
Administrative  
Workflows



Nick Culbertson

Robert Lord

**Protenus** aims to develop smarter, integrated healthcare administrative workflows that prevent wasted clinical time, improve patient satisfaction, and painlessly improve regulatory compliance.

Location  
Talinn, Estonia

Website  
[www.cognuse.com](http://www.cognuse.com)



Andres Mellik

Daniil Harik

Cognuse is developing solutions for the mental healthcare industry. Our core product platform CognuseManager is an evidence-based patient-centric tool for cognitive rehabilitation in the executive functions domain.

Location  
Athens, Greece



# Smartphone Pulmonary Monitor



Antonios Kouris

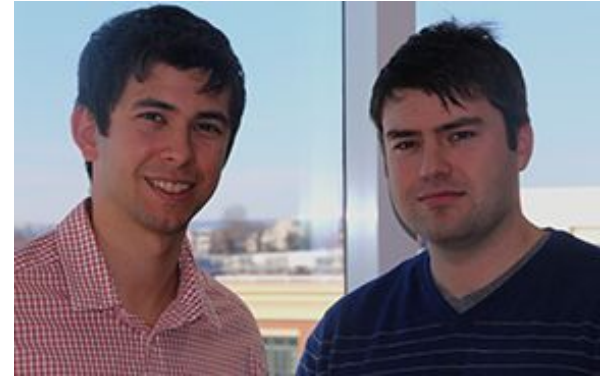
Ioanna Kastanioti

**Respi** is creating a handy spirometer that connects to the user's smartphone and enables measuring and sharing of pulmonary function measurements anywhere. Intended for variety of users, this is a low cost, feature rich, innovative solution.

Location  
Baltimore, Maryland

# Avhana<sup>+</sup>

Clinical  
Decision  
Support



Noah Weiner

Nate Weiner

Avhana hopes to create a marketplace to facilitate the exchange of clinical decision guidelines so physicians have access to thousands of these guidelines with one click.

Location  
Baltimore, Maryland



Mobile  
Information  
Platform



Sebastian Seiguer



Yao Huang



Sharon Kong



Morad Elmi



Jeff Daley

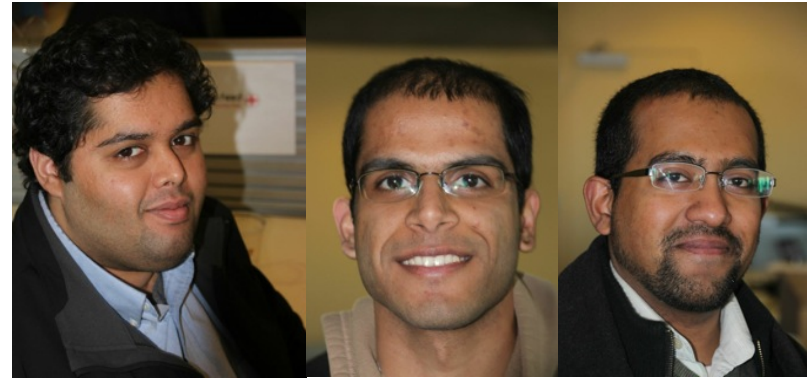
**Emocha** is designed to leverage mobile phones to assist health programs, researchers, providers, and patients improve communication, education, patient care, and data collection.



Location  
Pittsburgh, PA



# Inpatient Care Collaboration



Arif Rashid

Nadeem Kolia

Khalid Harun

**Patient Feed** is a real-time collaborative tool for hospitals that allows for an accessible overview of patient information and team tasks integrated over desktop and mobile devices with push notifications, activity feeds, and communication channel.

# US Company: Fitbit

- Provides activity trackers and activity tracking software to promote wellness and a healthy lifestyle.



## Fitbit Trackers

The Tracker measures steps taken and calculates distance walked, calories burned, floors climbed, and activity duration and intensity.

# MD Company: WellDoc

- Focused on developing solutions to support diabetes management
- Will hit \$50M funding mark with latest funding round

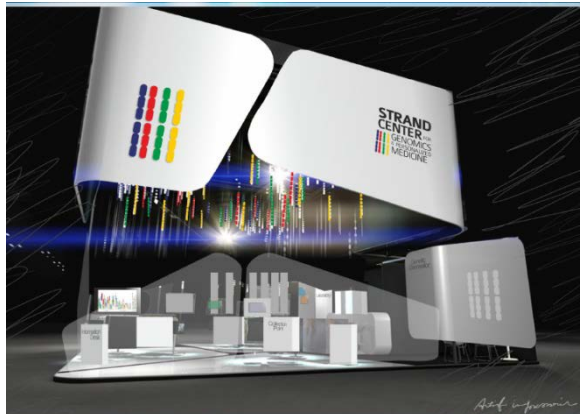


## **DiabetesManager®**

A system for health care providers to coordinate diabetes care, propel self-management and achieve long-term adherence.

# MD Company: Strand Life Sciences

- Focused on providing an end-to-end service that offers NGS Diagnostics to hospitals



**Molecular Biology Lab Services**  
Strand uses second generation sequencing instruments, compute clusters, and human brains to sequence, analyze and interpret genome data from a variety of organisms.

# MD Company: Vasoptic Medical, Inc.

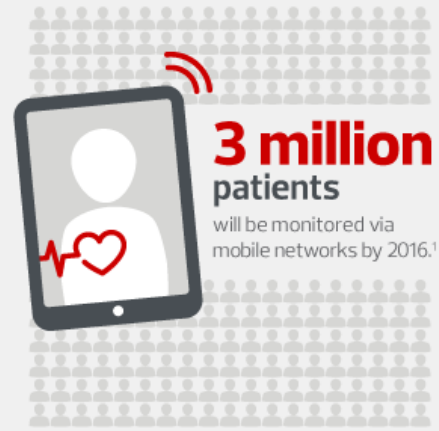
- An early stage start-up company with a mission to advance healthcare through innovation in medical diagnostics.



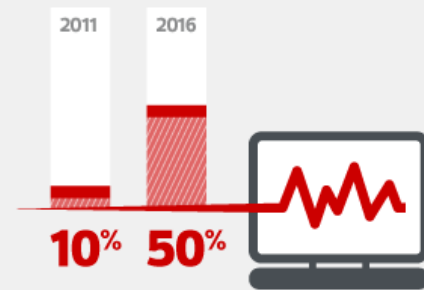
**XyCAM™ Retinal Imager**  
A solution for the early diagnosis of Diabetic Retinopathy & other conditions which is designed for primary care & telehealth settings.

# Healthcare IT Trends

## MOBILE NETWORKING



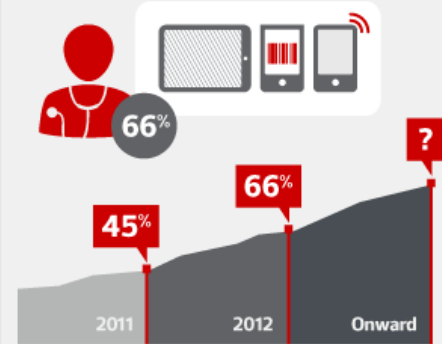
## DATA WILL CONTINUE TO PLAY A ROLE, BIG OR SMALL



10% of hospitals implemented data analytics tools in 2011, 50%+ are predicted to do so by 2016.<sup>3</sup>

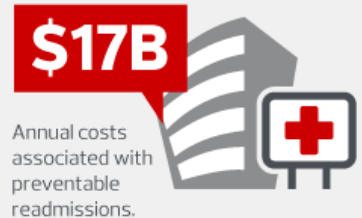
## MOBILITY AT THE PATIENT BEDSIDE

66% of doctors use iPads or other tablets for medical purposes, up from 45% a year earlier.<sup>4</sup>



## TELEHEALTH REINS IN READMISSIONS

A trial using remote video conferencing between nurses and recently discharged patients delivered a 97% success rate in preventing readmissions.<sup>5</sup>



# 10 Challenges for Health IT

1. First-generation EHR is failing
2. Healthcare industrialization is accelerating
3. Healthcare cloud adoption will flourish
4. The criticality of analytics will grow
5. Personalized clinical decision support
6. Provider consolidation
7. Revenue cycle management
8. Underinvestment in business continuity
9. Security and privacy issues
10. Compliance is expensive