Welcome to the 2019 BioHealth Capital Region’s EcoSystem Forum

Top 3 by 2023
State of the BioHealth Capital Region’s EcoSystem

Rich Bendis
President & CEO, BioHealth Innovation Inc.

9:20 – 9:30 am
April 8, 2019
#BHCRForum19
The name might be gone......

......But will never be forgotten!
We look forward to continued growth in the BioHealth Capital Region…

With

AstraZeneca
THANK YOU TO OUR BHCR ORGANIZERS AND OUR PLANNING COMMITTEE

AstraZeneca  

BioHealth Innovation

Children's National

HEMOSHEAR THERAPEUTICS

JOHNS HOPKINS UNIVERSITY

Maryland Department of Commerce

MARYLAND TECH COUNCIL

Quality Biological

University System of Maryland

VirginiaBio
Thank You Sponsors

Adventist HealthCare
altimmune
AstraZeneca
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BioHealth Innovation
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Emmes
EY
George Mason University
GSK
GlycoMimetics, Inc.
Greater Washington Partnership
Hemoshear Therapeutics
Immunic Therapeutics
JLL
Johns Hopkins University
J.P. Morgan
KAI Research
Loudoun Virginia Economic Development
MacroGenics
Maryland Department of Commerce
Maryland Tech Council
MaxCyte
Mimetab
miRecule
Montgomery County, Maryland
Morrison Foerster
NEA
Noble Life Sciences
Precision for Medicine
Prince William County, Virginia
Quality Biological
Regenxbio
Sheer Partners
Supernus Pharmaceuticals
Thrive Frederick
United Therapeutics Corporation
University System of Maryland
VielaBio
VirginiaBio
Wells Fargo
BioHealth Capital Region Forum Growth

Registrants

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<td>2018</td>
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<td>2019</td>
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Sponsors

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<tr>
<td>2018</td>
<td>50</td>
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<tr>
<td>2019</td>
<td>51</td>
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BHCR Support Organizations

BioHealth Innovation

Richard A. Bendis
President/CEO

"BHI sources and evaluates market-relevant biohealth intellectual properties, connects the IP with funding, and assists businesses in marketing and growth."

TEDCO

George Davis
CEO

"TEDCO provides framework of knowledge, funding, and networking to support an innovation eco-system that nurtures researchers, entrepreneurs, start-ups, and early stage companies engaged in bringing innovation ideas to market."

MARYLAND TECH COUNCIL

Marty Rosendale
CEO

"We are a collaborative community that is actively engaged in building strong technology and life science industries by supporting the efforts of our individual members."

Children’s National Health System

Kolaleh Eskandanian, PhD, MBA, PMP®
Vice President and Chief Innovation Officer

With a health care experience designed around kids’ unique needs, we’re the premier provider of pediatric services in the Washington, D.C., metro area and its only health system specializing in kids.

virginiaBio

Jeffrey M. Gallagher
CEO

“We fuel the network of leaders that drive bioscience to eradicate disease, save lives, and feed the world…one innovation at a time.”
Regional Initiatives

• Many independent regional initiatives highlighted in this Forum and for first time communication with each other

• Maryland Life Science Advisory Board implementing recommendations for Governor Hogan

• Greater Washington Partnership launched as well as Global Cities Export initiative

• MCEDC and WorkSource Montgomery two new private public partnerships operational
Collaboration

“The strength of the team is each individual member.
The strength of each member is the team.”

Phil Jackson
Goals of the Forum

The region’s leaders will:

• create new connections, leverage strengths, seize opportunities
• share developments of the year across the region
• continue evaluating region’s strengths, weaknesses, opportunities, threats
• further develop vision and identity for region

BioHealth Capital Region Initiative leaders will:

• report progress against goals from last year’s conference
• set new goals for coming year, informed by Forum participants
**Top 10 U.S. Biopharma Clusters**

**Ranking Based on Five Criteria:**

1. NIH Funding
2. Venture Capital Funding
3. Patents
4. Lab Space
5. Jobs

**2018**

1. Boston / Cambridge, MA
2. San Francisco Bay Area
3. New York/New Jersey
4. **Maryland / Virginia / DC Metro**
5. San Diego
6. Greater Philadelphia
7. Los Angeles / Orange County
8. Raleigh-Durham, NC (inc. Research Triangle Park, NC)
9. Seattle
10. Chicagoland
The Growth of the “BioHealth” Brand

BioHealth Innovation

BioHealth Capital Region

Office of Biohealth – Maryland Department of Commerce

BioHealth Capital Region – Genetic Engineering News

Institute for Biohealth Innovation – George Mason

Wisconsin’s Biohealth Industry

Women in Biohealth – U.W. Madison

Growing Biohealth Cluster – Ohio

Luxembourg Biohealth Cluster

South Korea Biohealth Industry

IT ALL STARTED HERE!
BioHealth Capital Region is on the way to achieving its stated goal of growing the Maryland / Virginia / Washington, D.C. region into a top-three cluster by 2023. In addition to longtime anchors such as the NIH and FDA, and academic institutions led by the Johns Hopkins University and University of Maryland system, the life sciences have seen expanded business activity and support from officials led by Virginia Gov. Ralph Northam (D) and Maryland Gov. Larry Hogan (R). The region is already third in NIH funding (3103 awards totaling $1.456 billion), 42% of which was awarded to Johns Hopkins ($605.781 million). Three U. of Maryland schools (Baltimore, College Park, and Baltimore County) garnered a combined $214.528 million.

BioHealth Capital is also third in patents (4943, just 32 ahead of San Diego), and fourth in lab space (with 22.5 million square feet according to Rockville, MD-based Scheer Partners, which measures the entire region [vs. JLL’s 9.5 million for “suburban Maryland”]). VC has improved from sixth in 2016: PwC/CB Insights ranks the region fourth with $944.07 million in 44 deals, but JLL tallies $1.1 billion, good enough for third. This year’s VC includes the $250 million Series A financing completed in February by Viela Bio in Gaithersburg, MD, formed when AstraZeneca spun off six pipeline candidates of its Gaithersburg-based MedImmune subsidiary. However, BioHealth Capital appears to lag in employment: JLL has the region ninth with 41,322 jobs, though Battelle in June showed a more respectable 63,287 jobs as of 2016, good for sixth place.
BHCR News Stories

WASHINGTON BUSINESS JOURNAL
“Danaher acquiring GE biopharma business for $21.4B”

WASHINGTON BUSINESS JOURNAL
“K2M closes $1.4B sale to Stryker”

BIOCENTURY
“Macrogenics raises $110M following breast cancer data”

BioSpace
“Autolus Brings in $150 Million in IPO, Continues Strong Investment Trend for Biotechs This Week”

MarketWatch
“Arena Pharmaceuticals Enters $1.2 Billion Agreement With United Therapeutics”

StreetInsider.com
“Regenxbio (RGNX) Raised $208 Million Public Offering Of Common Stock”

Business Wire
“NextCure Raises $93 Million in Series B Financing”

FIN SMES
“Emmes Receives Investment from Behrman Capital”
Biohealth Capital Region Historical Vacancy

Vacancy in Suburban Maryland has stabilized at record low levels.

Source: JLL Research
Biohealth Asking Rents

Suburban Maryland and the region offer competitive rates for life sciences space when compared against other top-tier biohealth clusters.

Source: JLL Research
While ranked 4th nationally in extramural research, the region leads when combined with NIH’s intramural research, which has over $3 billion of funding per year and is conducted by nearly 6,000 scientists primarily in Bethesda, MD.
VC Funding in the BioHealth Capital Region

Average deal size has climbed from $11.5 million to $14.8 million in 2018 as overall volume reached over $700 million.

Source: JLL Research
## Recent Investment Successes in BHCR

<table>
<thead>
<tr>
<th>Month</th>
<th>Company</th>
<th>Raise ($USD)</th>
<th>Type</th>
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<tbody>
<tr>
<td>January 2019</td>
<td>Aledade</td>
<td>$56,150,000</td>
<td>Venture Capital</td>
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<tr>
<td>October 2018</td>
<td>Altimmune</td>
<td>$16,900,000</td>
<td>Private Equity</td>
</tr>
<tr>
<td>November 2018</td>
<td>Ascentage Pharma</td>
<td>Raises $150,000,000</td>
<td>Venture Capital</td>
</tr>
<tr>
<td>August 2018</td>
<td>Aziyo Biologics</td>
<td>Raises $10,000,000</td>
<td>Private Equity</td>
</tr>
<tr>
<td>March 2019</td>
<td>Emmes</td>
<td>Receives equity financing with Behrman Capital</td>
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<tr>
<td>February 2019</td>
<td>MacroGenics</td>
<td>Raises $110,000,000</td>
<td>Venture Capital</td>
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<tr>
<td>April 2018</td>
<td>Mimetas</td>
<td>$20,500,000</td>
<td>Venture Capital</td>
</tr>
<tr>
<td>January 2018</td>
<td>NexImmune</td>
<td>$23,000,000</td>
<td>Series A; spin-out of MMH</td>
</tr>
<tr>
<td>November 2018</td>
<td>NextCure</td>
<td>Raises $93,000,000</td>
<td>Series B financing</td>
</tr>
<tr>
<td>July 2018</td>
<td>Neuraly Inc.</td>
<td>Raises $36,000,000</td>
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<tr>
<td>June 2018</td>
<td>Senseonics</td>
<td>$92,000,000</td>
<td>IPO</td>
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<tr>
<td>August 2018</td>
<td>Regenxbio</td>
<td>$201,800,000</td>
<td>IPO projection contingent on market conditions</td>
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<tr>
<td>May 2018</td>
<td>Viela Bio</td>
<td>Raises $357,000,000</td>
<td>Series A; spin-out of AstraZeneca</td>
</tr>
<tr>
<td>June 2018</td>
<td>WindMil Therapeutics</td>
<td>$32,500,000</td>
<td>Venture Capital</td>
</tr>
</tbody>
</table>
# M&A in the BHCR

### May 2018
- **BeneVir**
  - Agreement to be acquired by **Janssen**
  - For up to **$1,040,000,000**

### Feb 2019
- **Danaher**
  - Acquires Biopharma Business of GE Life Sciences for **$21,400,000,000**

### 2018
- **Emergent Biosolutions**
  - Acquires in pharma acquisitions (PaxVax and Adapt Pharma) **$1,000,000,000**

### Mar 2019
- **Smith & Nephew**
  - Acquires **Osiris Therapeutics, Inc.** for **$660,000,000**

### Aug 2018
- **Stryker**
  - Acquired K2M in transaction valued at **$1,400,000,000**

### Sept 2018
- **Supernus Pharmaceuticals**
  - Acquires in transaction valued at **$185,000,000**

### Nov 2018
- **United Therapeutics**
  - Receives exclusive rights worldwide for ralinepag from **Arena Pharmaceuticals** for **$1,200,000,000**

### Sept 2018
- **United Therapeutics**
  - Acquires **SteadyMed Therapeutics** in transaction valued at **$216,000,000**
Additional BHCR Successes

**K2m** In LEESBURG acquired by **Stryker** for $1.6b and becomes and the hub going forward for Stryker spine innovation

**Adial Pharmaceuticals** Charlottesville successful IPO

**Fralin Biomedical Research Institute** at Virginia Tech Carilion receives $50m gift, and Virginia Tech announces $1B “Innovation Campus” adjacent amazon HQ2 in Alexandria

**All of Us** Program national enrollment launched successfully powered by **Vibrent Health** Fairfax, to create first ever Participant engaged national research cohort of +1 million Americans.

**NCATS CTSA** awarded to a new statewide clinical and translational research collaboration among **Inova, UVA, Virginia Tech** and **Carilion Clinic**, thus Virginia’s second NCATS CTSA awardee.

**Type zero** (artificial pancreas) Charlottesville acquired by **Dexcom**.
2019 Crab Trap Finalists

**BeCareLink** - Predictive Artificial Intelligence Digital Therapeutic Mobile Platform for Multiple Sclerosis and other neurological conditions.

**BRAINBox Solutions** - Multi-Modality capability to diagnose and provide prognostic information for mild Traumatic Brain Injury.

**Floreo Inc.** - Leveraging the power of virtual reality to develop a subscription platform that delivers immersive, fun, and affordable lessons for children and adults with autism spectrum disorder (ASD).

**Spine Align** - Spine Align is a medical device company developing technologies that enable spine surgeons to make real-time intraoperative measurements of spinal alignment.

**Unleash Immuno Oncolytics** - Developing armed, oncolytic viruses to treat metastatic cancers. Our platform combines tissue-specific control of both viral replication and the expression of human cytokines to provide a dual punch in cancer cells.
2016
In 2016, the initial prize was awarded to **Sonavex**, a commercial stage Johns Hopkins spin-out focused on Empowered Patient Care. The company’s first technology is a dual-component system comprising an FDA-cleared bioabsorbable implant (EchoMark) and an FDA-cleared custom automated ultrasound (EchoSure) to detect post-operative vascular complications prior to catastrophic surgical failures that represent a $3B annual market and cost hospitals up to $577,000 per instance. The company closed a $4.5M Series A in 2018, recently secured a $3M NIH grant and is currently raising its Series B.

2017
In 2017, the winner was another Johns Hopkins spin-out, **LifeSprout**, developer of a suite of products to address soft tissue needs in the aesthetic and reconstructive markets.

2018
Last year’s winner, **Galen Robotics**, is developing, in partnership with JHU, a surgical robot to make minimally invasive surgeries faster, safer and more precise. The company plans a 510k submission next year, is raising Series A financing, and will be relocating the HQ team in CA to join their engineering experts in Baltimore.
## 2018 BHCR Investment Conference Recap

### 95 Invited Companies

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<td>Advanced BioNutrition</td>
<td>ExPrimary, Inc.</td>
<td>Perceptive Navigation, LLC</td>
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<td>Akan Biosciences</td>
<td>gel-e, Inc.</td>
<td>Remedy Plan Therapeutics</td>
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<td>Algometrx, Inc.</td>
<td>Gemstone Biotherapeutics, LLC</td>
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<td>American Gene Technologies</td>
<td>Glutaral Medical</td>
<td>Salveo Diagnostics</td>
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<td>Antidote Therapeutics, Inc.</td>
<td>Glyscend, Inc.</td>
<td>SciTech Development</td>
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<td>Anven Biosciences, Inc.</td>
<td>HeMemeics</td>
<td>Select OcuFLOW, Inc.</td>
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<td>AscelpiX Therapeutics</td>
<td>HemoShear Therapeutics, LLC</td>
<td>Sequella, Inc.</td>
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<td>Asulon Therapeutics Inc.</td>
<td>Ikigai Biotech Group Inc.</td>
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<td>Atrin Pharmaceuticals</td>
<td>Immunarray Ltd</td>
<td>Sisu Global Health Inc.</td>
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<td>Avant Diagnostics</td>
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<td>Sonavex, Inc.</td>
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<td>Avidea Technologies, Inc.</td>
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<td>Stuart Therapeutics, Inc.</td>
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<td>BioGraph 55, Inc.</td>
<td>KinaRx</td>
<td>SurgiBox, Inc.</td>
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<td>Bonumose LLC</td>
<td>Landos Biopharma</td>
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<td>BrainScope Company, Inc.</td>
<td>LifeSprout, Inc.</td>
<td>TaiRx US, Inc.</td>
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<td>BraneQuest</td>
<td>Liffey Biotech Ltd.</td>
<td>Teralimmune</td>
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<td>CARISMA Therapeutics</td>
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<td>Micro Interventional Devices, Inc.</td>
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<td>Ceres Nanosciences, Inc.</td>
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<td>NexImmune Inc.</td>
<td>Veralox Therapeutics, Inc.</td>
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<td>Cupron Inc.</td>
<td>NexStep Robotics Inc.</td>
<td>Weinberg Medical Physics, Inc.</td>
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<td>eKare Inc.</td>
<td>Opsidio, LLC</td>
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<td>Empower Telehealth</td>
<td>Orbit Genomics</td>
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### 32 Invited Investors

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<td>CrossRoads Capital Strategy</td>
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<td>Falls River Group</td>
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<td>Keiretsu Forum</td>
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<td>Leukemia &amp; Lymphoma Society</td>
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<td>Maryland Venture Fund (TEDCO)</td>
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<td>Maryland Venture Fund (TEDCO)</td>
<td>Middleland Capital (VTC Innovation Fund)</td>
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<td>Predictive Tech Group</td>
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<td>Prevail Partners</td>
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<td>Taiwania Capital</td>
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OCTOBER 15 + 16, 2019

Investment Conference
October 15 + 16, 2019
BY INVITATION

To connect Quality emerging BioHealth companies seeking capital to Investors looking for Quality deals.

SPONSORED BY: WSGR, BioHealth Innovation, J.P. Morgan, AstraZeneca

TOP 3 BY 2023

For more information contact: BHI@BioHealthInnovation.org
SAVE THE DATE  October 10th, 2019

6th Annual BioBowl

Come join us for the 6th Annual BioBowl!
You and your company team will be competing against other biotech firms to win the coveted BioBowl Trophy and bragging rights! ...Until next year

Date: Thursday, October 10th, 2019
Time: 4:00 - 6:30 PM (TBC)
Location: Bowlmor – 15720 Shady Grove Rd Gaithersburg, MD 20877

Invitation to follow.

Hosted By: BioHealth Innovation & AstraZeneca
SAVE THE DATE

BioHealth Capital Regional Forum
April 15 + 16, 2020
1 MedImmune Way, Gaithersburg, MD
BHCR Next Steps

• Continue marketing the Brand

• Increased Collaboration

• Leverage our Extensive Assets

• Accelerate Commercialization

• Grow the BioHealth Capital Region Cluster

Our Goal: To become a Top 3 BioHealth Hub by 2023
SPONSOR NETWORKING TABLES
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

THIS “US” IS STILL YOU!
A BIG THANK YOU TO

AstraZeneca

TAYLOR MADE EXPERIENCE