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Analytics

# Emerging Healthcare: Microbiome Investment Trends

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## Written by:

**Andrew Olson, PhD**  
Manager  
SVB Analytics

**Xiaoqi Liu**  
Associate  
SVB Analytics

## Contributors:

**Steve Allan, CFA**  
Managing Director  
Head of External  
Insights and Analytics

**Julie Betts**  
Managing Director  
SVB Securities

**Jennifer Friel Goldstein**  
Market Manager  
Head of West Coast Life  
Science & Healthcare

# The Macro Potential of the Microbiome

The human microbiome consists of more than 10,000 microbes and microorganisms that live in and around our bodies. These communities of bacteria, described as the second genome, aid the immune system by protecting us from pathogens and help us absorb the nutrients in our food.

As science has advanced our understanding of the remarkable microbiome, researchers have now started to study how to manipulate one's microbiome to address health problems. In turn, entrepreneurs and investors are converting these ideas into business opportunities, ranging from new therapeutics to diagnostic testing to advanced bioinformatics.

In this report, we will focus on the microbiome therapeutics space as we explore investment trends and growth opportunities in this young but promising sector.

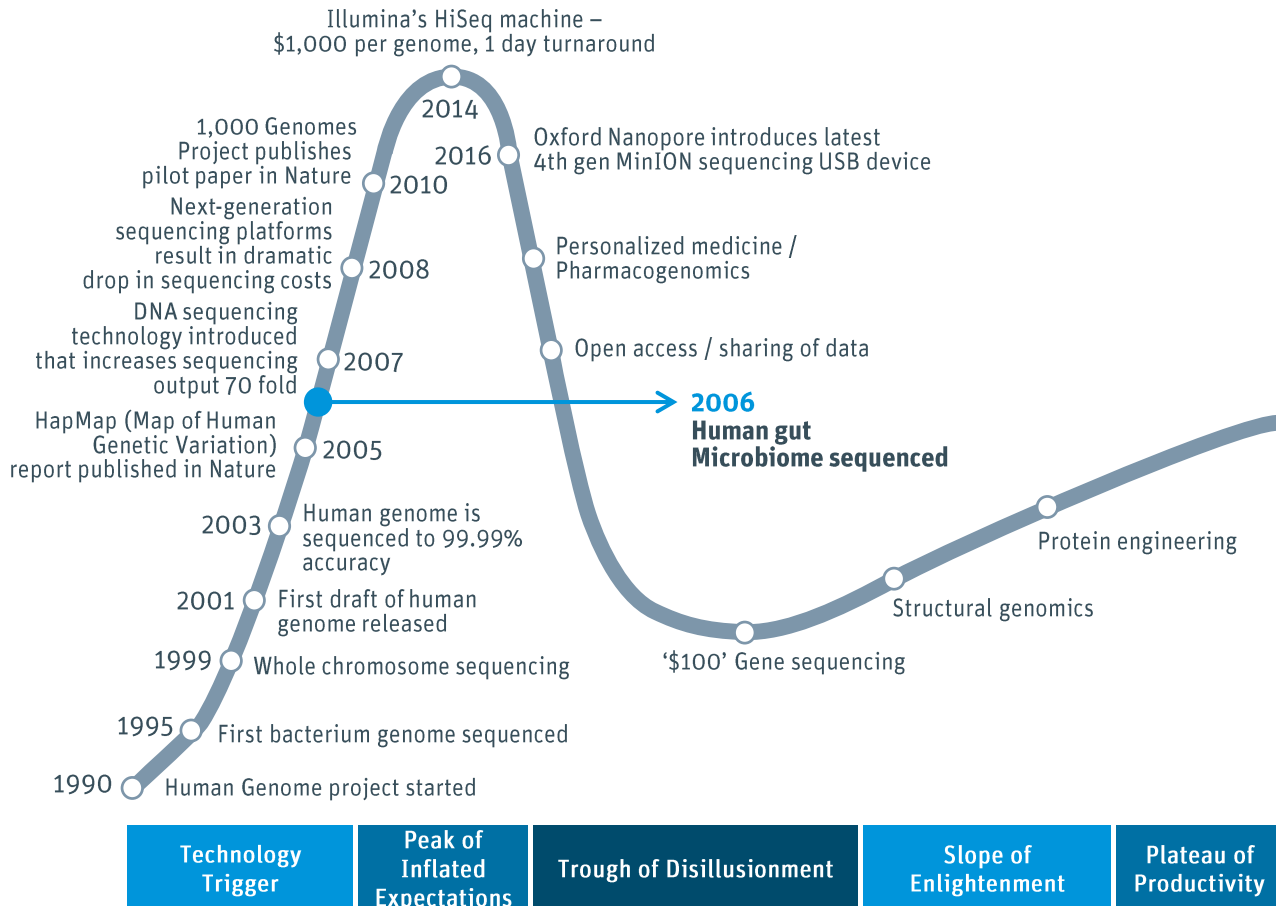
# Microbiome is Attracting Major Investments

## Key findings:

- The opportunity to create therapeutics that leverage the microbiome has attracted \$840M in 45 disclosed equity investments since 2010. Microbiome investment levels are set for a record 2017.
- The highest density of microbes is in the human gut, and companies with therapies addressing gastrointestinal (GI) and infectious diseases have captured almost half of the investment dollars.
- 2014 saw an inflection point, with the number and dollar amount of investments in private microbiome companies surging.
- Pre-money valuations of early-stage microbiome companies closely align with values in the broader biotech industry.

# Will the Microbiome Follow Same Hype Cycle as Gene Sequencing?

## Gene Sequencing Cycle 1990-2017

















The Gartner Hype Cycle identifies key inflection points as technologies launch, gain traction and mature. When applied to the evolution of gene sequencing, it highlights how long it has taken genomics to realize consumer applications such as personalized medicine. The microbiome is expected to have similarly profound impacts on human health, but, if the gene-sequencing cycle is any guide, the hype may outpace applications by several years.

There have been advancements in developing more powerful and cheaper computing processing that will enable more efficient analysis than was available in early gene sequencing. Still, hurdles are significant. They include FDA review, insurance reimbursement, patents and ethical and legal issues. And on the technology side, questions remain about how to handle mass genome sequencing and structure, aggregate and share the data.

# Microbiome Companies Are Focused on GI and Infectious Disease Therapeutics

## Microbiome Therapeutics Market Landscape\*

	Pre-clinical	Phase I	Phase II
Multiple Therapeutic Areas <sup>(2)</sup>	 Kaleido BIOSCIENCES  synbiotix BIOTHERAPEUTICS  synlogic  RondinX  Microbiome Intelligence  BiomX  BLUE TURTLE BIO  WHOLE BIOME	 CAELUS HEALTH  SECOND GENOME  THE MICROBIOME COMPANY	 Rebiotix  Microbiota Restoration Therapy
Gastrointestinal and Infectious Disease	 ELIGO BIOSCIENCE  EPIBIOME  PRECISION MICROBIOME ENGINEERING  TargetDys  TARGETING EATING DYSFUNCTIONS  SYMBIOTIC HEALTH  Bios Health  Evolve BioSystems™  SciBac	 assembly biosciences  MaPât  FINCH THERAPEUTICS	 SERES THERAPEUTICS™  SEL  Synthetic BIOLOGICS
Dermatology	 DERMALA  QUORUM THERAPEUTICS  NAKED BIOME™  azitra  Xycrobe THERAPEUTICS INC.  S-BIOMEDIC		 AOBIOIME
Cancer and Autoimmune	 Symberix, Inc.  Amrita THERAPEUTICS  VEDANTA BIOSCIENCES  EVELO BIOSCIENCES		
Central Nervous System	 AXIAL BIOTHERAPEUTICS  KALLYOPE  Holobiome		

Since the highest density of microbes is in the human gut, companies addressing GI and infectious diseases have captured almost half of the total dollars invested.

Given the nascence of the microbiome therapeutics industry, it's not surprising that most of the companies are pre-clinical. No microbiome therapeutics have gained FDA approval.

\*37% of companies in this chart are SVB clients.

Notes:

- 1) Throughout this analysis, only microbiome therapeutic companies were considered and any non-pharmaceutical applications (diagnostics, agriculture, consumer cosmetics, etc.) were excluded
  - 2) Development programs with indications in multiple categories on this chart and/or indications not represented
- Source: Company Websites, PitchBook and press releases.



# Microbiome Funding Sources Are Highly Fragmented

## Most Active Investors\* in Microbiome Therapeutics 2010–1H 2017



87% of microbiome investors have made only one investment in the subsector. Of the most active investors:

- J&J\*\* established the Janssen Human Microbiome Institute
- Europe's Seventure Partners, whose investors include Novartis and Danone, raised a \$175M+ microbiome focused fund in 2015
- Illumina's\*\*\* interest in the microbiome is not surprising given the overlapping history with genomics.

\*N = 112 investors, 33 companies, from 2010-1H 2017. Reflects VC equity investments; excludes grants and convertible debt financings.

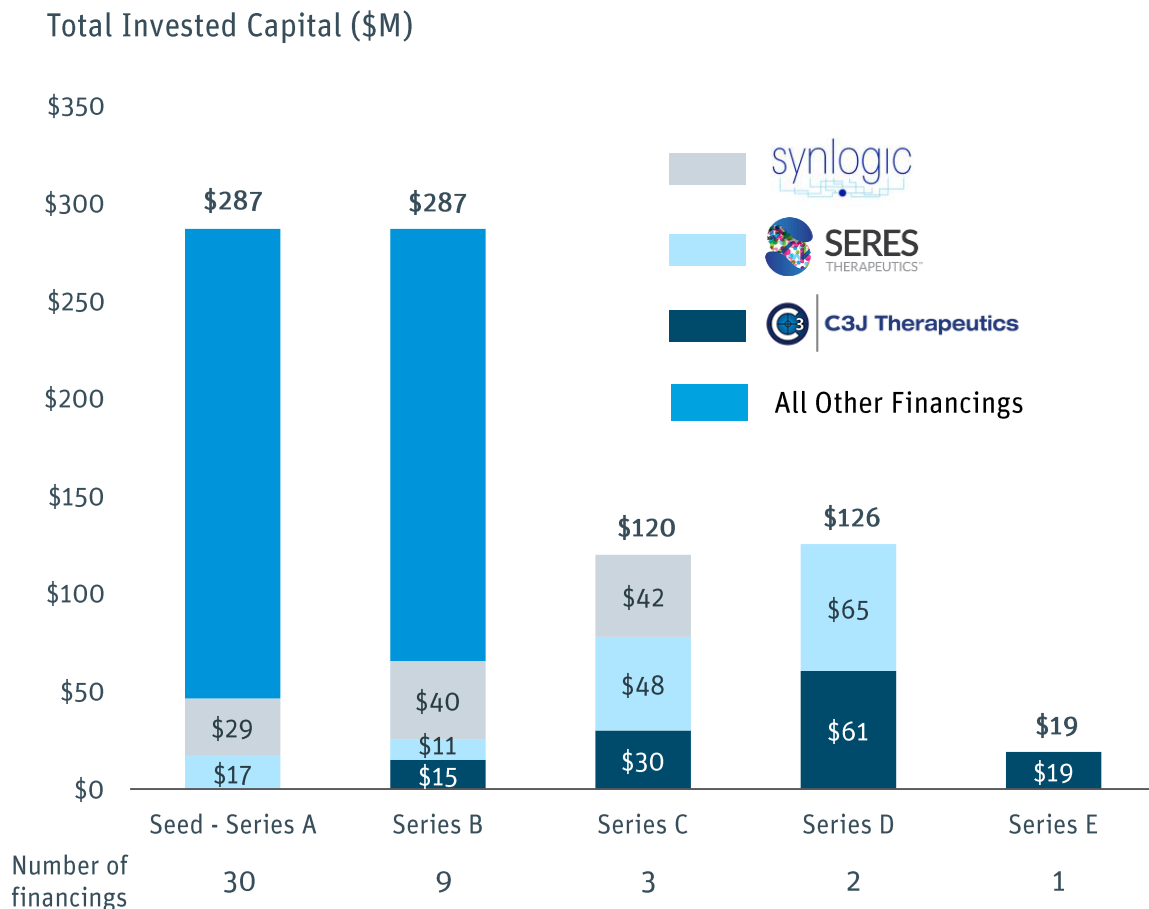
\*\*Includes JJDC and Jlabs

\*\*\*Includes Illumina, Illumina Accelerator, and Illumina Ventures

Source: Company Websites, PitchBook and press releases.

# Less than \$1B Has Been Invested

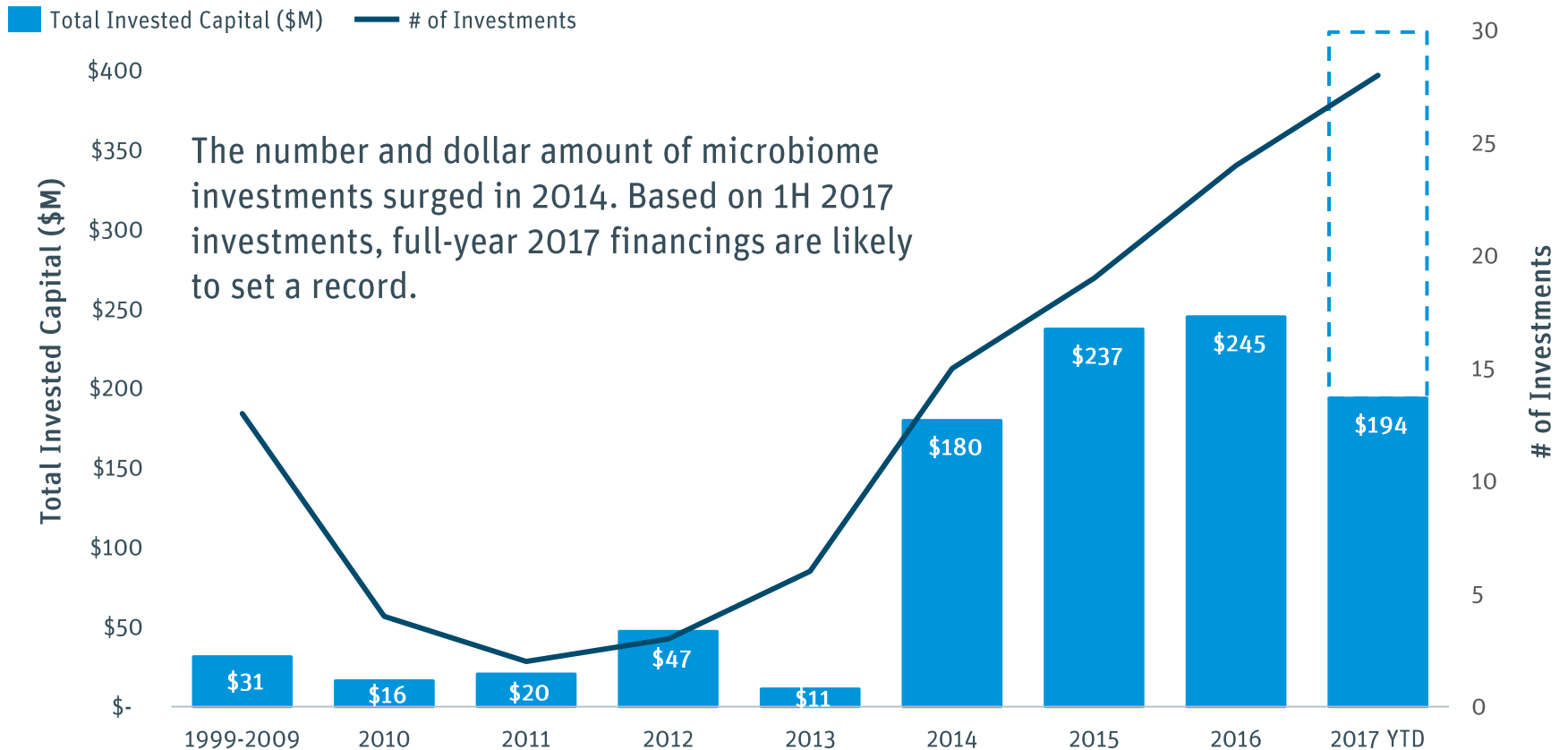
## Total Invested Capital by Series 2010–1H 2017\*



- Since 2010, microbiome companies have attracted \$840M in 45 disclosed equity investments.
- Just four microbiome therapeutic companies have gone public: Synthetic Biologics (IPO July 2007), Assembly Biosciences (reverse merger March 2015), Seres Therapeutics (IPO June 2015), and Synlogic (reverse merger May 2017).
- The median round size of Seed-Series A was \$6M and of Series B was \$30M.
- GI and infectious disease accounted for 47% of investments, followed by cancer and autoimmune combined at 13%, CNS at 6% and Dermatology at 4%.

# Microbiome Investment Levels Set for Record 2017

## Investment Deals by Year 2010–1H 2017\*

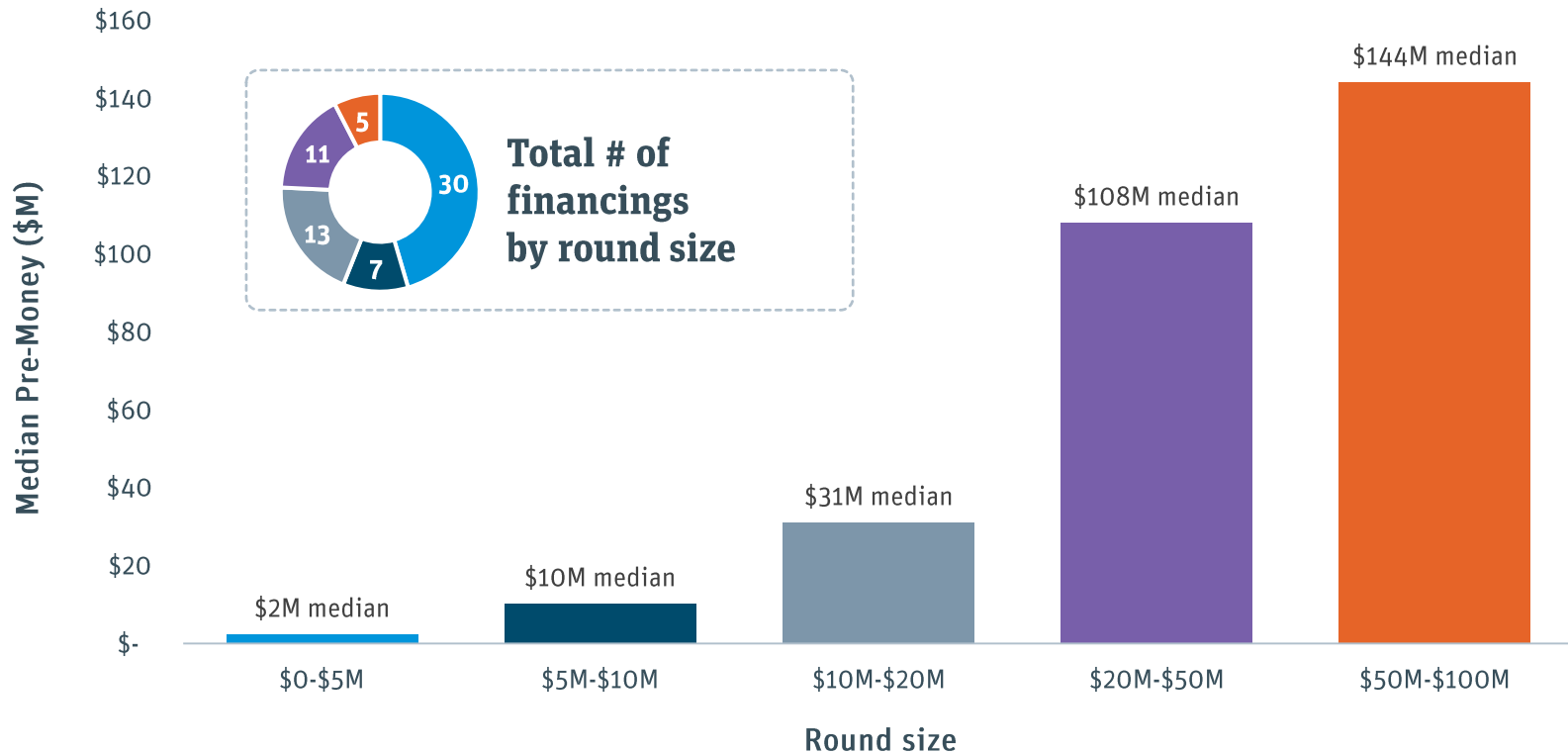




# Microbiome Pre-Money Valuations Match Overall Biotech

## Disclosed Median Pre-Money Valuation 2010–1H 2017\*

Early-stage pre-money valuations of microbiome companies closely align with values in the broader biotech industry.



\*The pre-money valuation data is based on SVB proprietary data and publicly available information and represents slightly less than half of the publicly disclosed financings that have occurred since 2010. The sample for later-stage activity is too small to identify trends.

Total financings: Includes rounds without pre-money data; N=66 financings, 35 companies, from 2010-1H 2017

Pre-money statistics: N=29 financings, 16 companies, from 2010-1H 2017

Source: SVB proprietary data, Company Websites, PitchBook and press releases.

# About the Authors



**Andrew Olson, PhD**  
Manager  
SVB Analytics  
[aolson@svb.com](mailto:aolson@svb.com)

Andrew Olson, PhD is a life sciences manager at SVB in San Francisco, where he performs valuations and strategic advisory services with a focus on biotech mergers and acquisitions. Combining his extensive training as a chemist with his passion for the commercial side of innovation, Andrew is a valuable partner to both early-stage and larger biotech companies.



**Xiaoqi Liu**  
Associate  
SVB Analytics  
[xliu@svb.com](mailto:xliu@svb.com)

Xiaoqi Liu is an analytics valuations associate in Life Sciences at SVB in Boston, Mass., where he's a trusted source for strategic advice, valuations and research in the biopharmaceutical field. In this role, Xiaoqi steers biopharma entrepreneurs through the challenges they face in technology commercialization, pointing the way toward the best path to value creation.

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## Contributors



**Steve Allan, CFA**  
Managing Director, Head of Analytics  
SVB Analytics  
[sallan@svb.com](mailto:sallan@svb.com)

As Head of SVB Analytics and SVB Securities Strategic Advisory, Steve Allan is responsible for the three areas of information services provided to the innovation economy, Strategic Advisory Services, Compliance Valuations, and Insights.



**Julie Betts**  
Managing Director  
SVB Securities  
[jbetts@svb.com](mailto:jbetts@svb.com)

Julie Betts leads SVB's Life Science Strategic Advisory effort, where she is responsible for managing client engagements and leading execution for advisory projects, including deal sourcing and introductions, benchmarking, strategic valuations, structuring and transaction support.



**Jennifer Friel Goldstein**  
Managing Director, Life Sciences West Coast Manager  
SVB Analytics  
[jgoldstein@svb.com](mailto:jgoldstein@svb.com)

Jennifer is responsible for SVB's West Coast Life Science and Healthcare Practice, runs the National Accelerator for Healthcare, and serves as the Head of our Biotechnology and Diagnostics Practice. She is also focused on Corporate Venture initiatives across the bank within the Healthcare vertical.



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