

THE NEXT GENERATION OF HEALTHCARE  
**2018 CLEVELAND**

**\$2.3B**  
INVESTED IN MORE THAN  
**400**  
BIOMEDICAL STARTUP  
COMPANIES\*

**700+**  
BIOMEDICAL  
COMPANIES

**36**  
CLEVELAND-AREA  
BIOMEDICAL  
INVESTORS



**159**  
NATIONAL AND  
INTERNATIONAL  
INVESTORS IN  
CLEVELAND  
COMPANIES

**67 EXITS\*\***

**\$5.6B**  
BIOMEDICAL  
SECTOR



# The Medical Capital

CLEVELAND

Internationally renowned clinical, educational, and research institutions, supportive philanthropies, government and economic development engines, funding, talent, strong biomedical innovation, and an abundant workforce.



## ASSETS & RESOURCES

### CLINICAL AND RESEARCH INSTITUTIONS

Globally recognized clinical and research institutions provide the platform for Cleveland's biomedical industry. Together these organizations conduct over \$735 million in annual sponsored research and are nationally ranked in multiple specialty areas. The institutions collaborate closely with regional biopharmaceutical, medical device and health IT companies to advance innovation.

#### SELECTED INSTITUTIONS INCLUDE:

##### CLEVELAND CLINIC

Nationally ranked #2 in Best Hospitals Honor Roll. 23 specialty rankings include #1 in heart and heart surgery for 23 years in a row; #1 in urology; #2 in gastroenterology & GI surgery, nephrology, and rheumatology

##### UNIVERSITY HOSPITALS

Nationally ranked in 17 specialties, including ear, nose & throat, gastroenterology & GI surgery, gynecology, nephrology, and neurology & neurosurgery

##### AKRON CHILDREN'S HOSPITAL

Nationally ranked in pediatric urology and neonatology

##### METROHEALTH MEDICAL CENTER

Northeast Ohio's only Level 1 pediatric trauma center and home to the only adult and pediatric burn unit in the State of Ohio

##### LOUIS STOKES CLEVELAND VA MEDICAL CENTER

Eight centers of excellence, including open heart surgery and geriatric evaluation and management

##### CASE WESTERN RESERVE UNIVERSITY

Ranked 13<sup>th</sup> in the country for commercialization of research; School of Medicine ranked Top 25 in research

### EDUCATIONAL INSTITUTIONS

Northeast Ohio is home to 25 universities that offer graduate and undergraduate programs, as well as certificates and diplomas, serving the region's healthcare, health IT, and bioscience industries. Since 2006, these institutions have awarded more than 23,000 bioscience degrees.

#### SELECTED INSTITUTIONS INCLUDE:

##### CLEVELAND STATE UNIVERSITY

Among the top 20 percent of U.S. universities for research and development, the College of Sciences and Health Professions enrolls more than 2,600 students annually, and includes 14 masters' programs and 16 undergraduate programs focused on educating future researchers, clinicians and bioscience workers.

##### KENT STATE UNIVERSITY

The birthplace of liquid crystal displays, Kent State is home to the world's first Liquid Crystal Institute.

##### NEOMED

For more than 40 years, Northeast Ohio Medical University (NEOMED) has worked in collaboration with its educational, clinical and research partners to successfully train health professionals and medical researchers who serve and impact the region and beyond. The University trains students in a team-based, interprofessional environment and offers Doctor of Medicine (M.D.) and Doctor of Pharmacy (Pharm.D.) degrees, as well as masters' and doctoral degrees and research opportunities in additional areas.

##### THE UNIVERSITY OF AKRON

The University of Akron maintains the nation's largest Ph.D. student body in polymer science and polymer engineering. The program is the largest and broadest in the U.S., dating from 1910.



Northeast Ohio institutions have been awarded over **\$525 million** to develop centers of innovation in cardiovascular therapies, biomaterials, neurostimulation, medical imaging, and regenerative medicine.

## INNOVATION HUBS

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### GLOBAL CENTER FOR HEALTH INNOVATION

The Global Center for Health Innovation, located in Cleveland, is the platform where global healthcare leaders – industry, health systems, investors, and innovators – convene and collaborate to develop solutions to solve high-priority healthcare issues. Engaged brands include BioEnterprise, Cardinal Health, Case Western Reserve University, Cleveland Clinic, DHG Healthcare, G2G consulting, GE Healthcare, Gleeson, HIMSS, Innovation Fund Northeast Ohio, JumpStart, MetroHealth System, OnBase by Hyland, NGP Capital, Philips Medical, Plug and Play, RiverVest Ventures, RRE Ventures, Siemens, SmartShape, Steris, TeamNEO, University Hospitals System and multiple digital health, medical device and biotechnology startups.

### HEALTH-TECH CORRIDOR

Located in the heart of Cleveland, the Health-Tech Corridor is a three-mile thoroughfare that houses more than 170 biomedical, healthcare, and technology companies that take advantage of close proximity to healthcare institutions, including Cleveland Clinic and University Hospitals, business incubators, and academic centers, including Case Western Reserve University.

### AKRON BIOMEDICAL CORRIDOR

Focusing on orthopedics, wound healing, burns, imaging and biomaterials, the Akron Biomedical Corridor connects three hospitals, including the Summa Health System, Cleveland Clinic Akron General, and Akron Children's Hospital, and two universities, NEOMED and The University of Akron. The Corridor is home to Bounce Innovation Hub, Akron Global Business Accelerator, and the Akron BioInvestments Funds.

## ENTREPRENEURIAL SUPPORT

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### BIOENTERPRISE

BioEnterprise guides the growth of the biomedical industry in Northeast Ohio. The initiative provides biotechnology, medical device, and health IT companies access to: funding opportunities, privileged relationships with world-class research and clinical institutions, management guidance, business development and alliance support for strategic partnerships, and strategic marketing and communications. In addition, BioEnterprise convenes and leads strategy for industry-transforming initiatives such as The Medical Capital, HIT in the CLE, and the Global Center for Health Innovation.

### GLOBAL CARDIOVASCULAR INNOVATION CENTER

The Global Cardiovascular Innovation Center (GCIC) houses startup companies developing innovative solutions for the diagnosis and treatment of cardiovascular diseases. Strategically located near the main campuses of Cleveland Clinic, Case Western Reserve University and University Hospitals, the incubator offers 50,000 sq. ft. of state-of-the-art space. Clients enjoy customizable laboratory facilities for new product research and development activities, conference rooms, and flexible office space. The facility provides clients with convenient access to world-leading clinicians and investigators along with all of GCIC's business support services.

### REDIZONE

Located on the campus of NEOMED, the Research, Entrepreneurship, Discovery, and Innovation Zone (REDIzone) is a biomedical business incubator focused on company attraction and growth in the areas of auditory neuroscience, community-based mental health, metabolic and cardiovascular disease, and musculoskeletal biology.

### SEARS THINK[BOX]

An innovative home for out-of-the-box thinkers, Case Western Reserve University's think[box] provides a space for product design, development, and commercialization. The facility is open to students, faculty and staff, and community entrepreneurs.

### FLASHSTARTS

Flashstarts is a startup accelerator and venture fund focused on the innovation of software and technology. The accelerator provides entrepreneurs with mentors, startup capital, office space, and other customized resources.

### TEAMNEO

TeamNEO markets Northeast Ohio to the world and collaborates with its partners and others to attract new businesses, help those that are here to grow, and accelerate the pace and impact of innovation in the region.



Greater Cleveland's biohealth industry has created over 5,000 jobs and **\$273 million** in new capital expenditures since 2012.

**PLUG AND PLAY CLEVELAND DIGITAL HEALTH ACCELERATOR**  
Silicon Valley's Plug and Play established a digital health innovation accelerator located in the Global Center for Health Innovation. The accelerator will operate two 10-week cohort programs annually, attracting dozens of startups and connecting its sponsors, members, and partners.

**BOUNCE**  
Bounce Innovation Hub brings together startup founders, small businesses, large corporations, investors, makers, individual innovators, artists, and universities to create meaningful connections that serve Northeast Ohio's entrepreneurial and innovation community.

### CONTRACT RESEARCH, REGULATORY AND MANUFACTURING

Northeast Ohio is home to some of the industry's leading CRO and regulatory experts including NAMSA, Clinical Research Management, IMARC and WIL Laboratories. The region also has a robust local biomedical manufacturing base, from full-service custom product design to component and finished product manufacturing.

## CRITICAL MASS

Cleveland's biomedical industry has grown from 300 companies in 2002 to over 700 companies in 2017. Medical device companies make up half of the total and include firms such as Philips, Hitachi, STERIS, Siemens, and GE Healthcare. Regional biopharmaceutical companies include Oakwood Labs, BioMotiv, Athersys, Charles River Labs, Xelia Pharmaceuticals, and Abeona Therapeutics. A growing number of healthcare IT and services companies, including Hyland Software, Explorys (an IBM Company), COMS, CoverMyMeds (a McKesson company), and OnShift complete the industry composite.

In 2017, seven Northeast Ohio biomedical companies were acquired by global concerns.

### 7 EXITS IN 2017

ACQUIRER	TARGET
Quest Diagnostics	Cleveland HeartLab
Kerry Group	Ganeden
Great Hill Partners	PartsSource
ERT	ImageIQ
Centauri Health Solutions	Human Arc
McKesson	CoverMyMeds
LED Dental	Apteryx



**67 EXITS**  
SINCE 2002

Not only are biomedical companies raising record amounts of private capital and exiting at an increased pace, but maturing companies are actively merging and acquiring companies as well.

In 2017, three Northeast Ohio biomedical companies made acquisitions to further build their capabilities.

### 3 ACQUISITIONS IN 2017

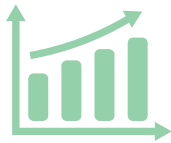
ACQUIRER	TARGET
Nordson	Vention Medical (product line)
Hyland Software	Lexmark (perceptive portfolio)
Alpha Imaging	Medical Imaging Systems



# INNOVATION

## STARTUP ACTIVITY

An ever-growing pipeline of funded startup companies demonstrates the vibrant biomedical environment in Cleveland.



\$2.3 BILLION IN GROWTH CAPITAL\*\*



30+

CLINICAL, RESEARCH, AND EDUCATIONAL INSTITUTIONS

\$300M+

IN LICENSING REVENUE\*

\$140M+

IN SBIR GRANTS TO REGIONAL BIOSCIENCE STARTUPS\*\*\*

159

NATIONAL AND INTERNATIONAL INVESTORS IN CLEVELAND COMPANIES

IN 2017 62 COMPANIES RAISED

\$218M

\*SINCE 2000  
\*\*SINCE 2001  
\*\*\*SINCE 2003

## 36 CLEVELAND-AREA BIOMEDICAL INVESTORS (2002-Present)

### VENTURE CAPITAL & GROWTH EQUITY FUNDS

Acquire Investments  
Arsenal Venture Partners  
Blue Point Capital  
Bridge Investment Fund  
Cascade Partners  
Early Stage Partners  
Edgewater Capital  
Everett Partners  
Glengary Ventures  
Hopen Life Science Ventures  
Kirtland Capital Partners  
Morgenthaler  
Mutual Capital Partners  
NDI Healthcare Fund  
NewVista Group  
North Coast Venture Fund  
Primus Capital  
RIK Enterprises  
Riverside Company  
RiverVest Ventures  
Roulston Ventures

### ANGEL FUNDS & NETWORKS

Akron ARCHAngel Network  
North Coast Angel Fund  
RMS Investment Corporation  
Second Generation  
Zapis Capital Group

### SEED FUNDS

Akron BioInvestments Funds  
Cleveland Clinic Biovalidation Fund  
Digital C  
Flashstarts  
GLIDE Fund  
Global Cardiovascular Innovation Center  
The Harrington Institute  
JumpStart Funds  
Lorain Community College Fund  
Valley Growth Ventures

## 116 NATIONAL & 7 INTERNATIONAL INVESTORS IN CLEVELAND COMPANIES (2002-Present)

### BOSTON

Ampersand Capital Partners  
Bain Capital Ventures  
Boston Scientific  
Capital Resource Partners  
CompuGroup Medical  
DSM Venturing  
Excel Venture Management  
Fidelity Biosciences  
Fletcher Spaght Ventures  
HealthCare Ventures  
JDRF  
MPM Capital  
Nautic Partners  
Norwich Ventures  
Polaris Partners  
RA Capital  
Siemens Venture Capital  
Summit Partners  
Tekla Capital Management

### NEW YORK AREA

Accelerator Corporation  
Accipiter Capital Management  
Aisling Capital  
Amphion Innovations  
Aperture Venture Partners  
Behrman Capital  
Clayton, Dubilier & Rice  
CortecGroup  
Cowen Group  
Easton Capital Investment Group  
Foundation Medical Partners  
Frontcourt Ventures  
Goldman Sachs  
Great Point Partners  
Greatbatch  
Investor Growth Capital  
Johnson & Johnson Innovation  
Life Sciences Capital  
MSD Capital  
New Science Ventures  
North Peak Capital  
Oak Investment Partners  
OrbiMed Advisors  
Psilos Group

Radius Ventures  
Sunrise Equity Partners  
Tenex Capital  
Toucan Capital  
Welsh, Carson, Anderson & Stowe

### SOUTH

Austin Ventures  
Black Beret Life Sciences  
EDG Partners  
ExOxEmis  
Green Park & Golf Ventures  
Heritage Group  
Maverick Capital  
Mayport Venture Partners  
MB Venture Partners  
Pappas Ventures  
River Associates Investments  
Santé Ventures  
Tiberius II  
TriStar Technology Ventures

### WEST COAST

3X5 Partners  
ABS Capital Partners  
Alexandria Venture Investments  
Alliance of Angels  
The Compass Group  
DW Healthcare Partners  
Francisco Partners  
Health Velocity Capital  
HLM Venture Partners  
Invesco  
Kearny Venture Partners  
Keiretsu Forum Northwest  
Palo Alto Investors  
SV Life Sciences  
Takeda Ventures  
TPG Biotech  
U.S. Venture Partners  
Visionary Venture Fund  
Vivo Capital  
WRF Capital  
Watson Fund  
Western Technology Investment

### MIDWEST\*

AbbVie  
Advantage Capital Partners  
Allos Ventures  
Arch Venture Partners  
Aspire Capital  
Baird Capital Partners  
Beecken Petty O'Keefe & Company  
Blue Chip Venture Company  
Bluestem Capital  
Charter Life Sciences  
Chrysalis Ventures  
CID Capital  
CoreNetwork Fund  
Cressey & Company  
Draper Triangle Ventures  
Drive Capital  
Eli Lilly  
First Analysis  
Kentucky Seed Capital Fund  
Medtronic  
Ohio Innovation Fund  
Ohio TechAngels  
Osage University Partners  
Queen City Angels  
Rev1 Ventures  
River Cities Capital Funds  
SWMF Life Science  
Thoma Bravo  
Thomas, McNerney & Partners  
Triathlon Medical Venture Partners  
Venture Investors  
West Capital Advisors

### INTERNATIONAL

Arix Bioscience  
Medicxi  
MBL Venture Capital  
Sanofi  
TIE  
WuXi AppTec  
Xeraya Capital

\* Cleveland-area biomedical investors listed separately

# The MedicalCapital

CLEVELAND

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*The Medical Capital initiative is a collaboration of Cleveland's internationally renowned clinical, educational, and research institutions, philanthropies, government, and economic development engines. Convened by BioEnterprise, the initiative promotes the vibrant biomedical and healthcare industry in the 18-county Northeast Ohio region. The Medical Capital includes more than 700 biohealth companies, 30 clinical, research and educational institutions, \$735 million annually in research funding, and more than \$200 million annually in private startup funding. For more information: [www.themedicalcapital.com](http://www.themedicalcapital.com).*