

**BREAKTHROUGHS IN  
BIOHEALTH  
CONVERGE IN WISCONSIN.<sup>®</sup>**



# WHY BIOHEALTH COMPANIES CHOOSE WISCONSIN

Companies looking to start, expand or relocate their operations in Wisconsin benefit from the state's central location, reliable infrastructure, talented workforce and business-friendly policies—all of which create competitive advantages that help businesses capitalize upon regional, national and global market opportunities.

Wisconsin's long history of innovation continues to fuel new solutions to challenges facing people, companies, nations and our very planet, with some of the most respected companies in the world drawing upon Wisconsin's plentiful natural resources, renowned research capabilities and the can-do spirit of its citizens to grow and succeed.

## TALENT

Wisconsin is well known for its industrious, Midwestern work ethic, and its educational system is universally admired. Wisconsin's high school graduation rate is consistently ranked among the top in the nation, and the University of Wisconsin System is regularly cited as a leader in terms of size and quality.

Wisconsin's public and private colleges support the resources, companies and policy makers throughout the state that are working to develop new, innovative products to fulfill market needs. And as the first state in the nation to develop a technical college system, Wisconsin has more than 100 years' experience training its workforce to fulfill ever-changing industry demands.

AMONG U.S. STATES, WISCONSIN RANKS  
 **#2** IN MANUFACTURING  
EMPLOYMENT  
CONCENTRATION

Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages, 2016

In the field of biohealth, distinct subsectors including medical device manufacturing, bioscience, digital health, diagnostics and biopharmaceuticals are converging into a single interconnected, synergistic field to create the best solutions to today's health challenges.

Wisconsin's historical strength in bioscience, manufacturing and technology makes it ideally positioned to take advantage of this convergence, and to lead the way in producing the integrated health solutions of tomorrow.

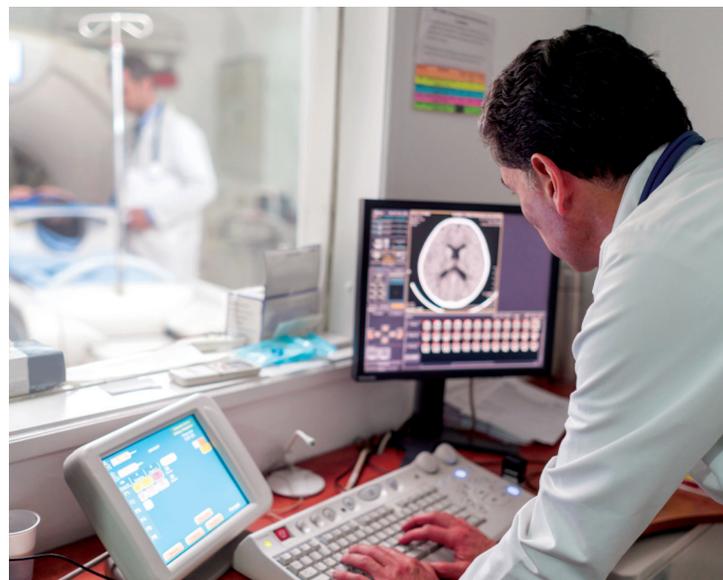
## BY THE NUMBERS

Wisconsin's biohealth sector is responsible for more than 44,000<sup>1</sup> jobs statewide, not including academic research institution and health systems jobs. Wisconsin's research universities are especially focused on bioscience relative to other fields, with \$887 million in bioscience academic research and development in 2014, accounting for 70 percent of all academic research at these institutions, compared with 61 percent for the national average.<sup>2</sup> Wisconsin is home to over 1,900 biohealth companies in all.<sup>3</sup>

<sup>1</sup> EMSI Q2 2017 dataset, class of worker category, QCEW Employees 2015 Employment and Infogroup

<sup>2</sup> TEconomy / BIO, "The Value of Bioscience Innovation in Growing Jobs and Improving Quality of Life 2016."

<sup>3</sup> Infogroup, 2017



# UNIQUE INDUSTRY ADVANTAGES

## Wisconsin's strength in biohealth is unique in that it spans four major subsectors:

- Medical devices and diagnostics.** Wisconsin is home to a number of medical imaging companies and groundbreaking medical imaging research. This subsector constitutes one of the state's chief export categories, including a wide variety of medical equipment—everything from MRI and dialysis machines to pacemakers and vacuum devices for negative pressure wound therapy, as well as diagnostic equipment, supplies and kits.
- Biotechnology and biopharmaceuticals.** From the development of drugs and therapies to translational and integrated science, Wisconsin has a long standing history of excellence in biotechnology and biopharmaceuticals. Wisconsin continues to demonstrate its strength in this sector with its flourishing hub for biomanufacturing and clinical trials, with over 2,000 active clinical trials for new medicines in collaboration with the state's clinical research centers, university medical schools and hospitals. <sup>4</sup>
- Digital health.** Innovations at the intersection of software and health solutions are empowering patients and health care systems to provide personalized care, improve quality and reduce costs. This is Wisconsin's fastest-growing biohealth segment.

- Health research institutes.** Wisconsin boasts some of the nation's top research institutes. Federal grants alone contribute over \$1 billion in funding to Wisconsin's economy each year, <sup>5</sup> with the National Institutes of Health supporting more than 900 grants in 2015 alone. <sup>6</sup> On its own, the University of Wisconsin System contributed more than 9,100 academic research and development projects in 2016. <sup>7</sup>

Wisconsin is also a world leader in animal genetics, with companies such as ABS Global, Accelerated Genetics and Alta Genetics.

## IN GOOD COMPANY

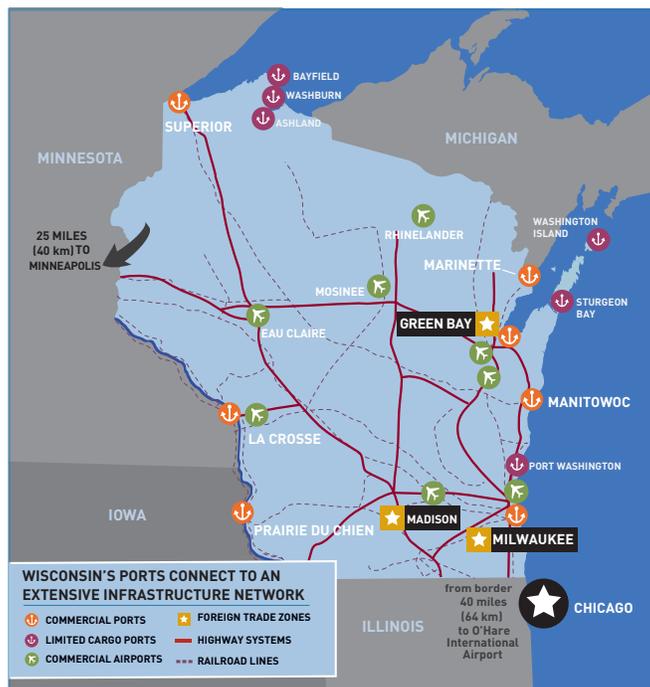
Wisconsin's vibrant biohealth sector includes companies such as:

- Exact Sciences
- GE Healthcare
- Phillips-Medisize
- Lucigen
- Promega
- Covance
- PPD
- Thermo Fisher Scientific
- Epicentre-Illumina
- Epic Systems
- Catalent Pharma Solutions
- Gilson Inc.
- Dohmen Life Science Services

## INFRASTRUCTURE

Wisconsin's central location and robust infrastructure give companies operating in the state one-day access to major markets throughout the U.S. and beyond. Wisconsin's roads, railways and ports provide seamless, convenient access to the world's busiest multimodal transportation hub, located just 55 miles south of the state's border.

<sup>4</sup> phrma.org "Research in Wisconsin" report, 2017  
<sup>5</sup> 2015 Wisconsin Bioscience Economic Development Report, Ernst & Young and BioForward  
<sup>6</sup> NIH State Funding Facts for Wisconsin, 2015  
<sup>7</sup> UW System: wisconsin.edu/economic-development/download/EconDevInfoGraphic-FINAL.pdf



## INFRASTRUCTURE IN WISCONSIN

**09 HIGHWAY SYSTEMS**  
 State commerce and industry relies on nine major highways covering more than 11,800 miles (18,990 km) to move our goods to market. Our interstate system connects us to major industrial cities across the U.S.

**13 RAILROAD LINES**  
 Rail traffic throughout the state continues to grow and move more than \$122 billion in freight each year, creating a seamless link in the nationwide intermodal system. Amtrak travels between Chicago and Milwaukee multiple times daily.

**08 COMMERCIAL AIRPORTS**  
 Eight commercial airport locations serving major industrial and metropolitan areas statewide. These airports are served by all major carriers, linking to every point in the nation within one business day. In addition, these larger airports are within driving distance:

**CHICAGO:** O'Hare is American's second largest hub, with 963 domestic flights daily to 153 U.S. cities and more than 100 direct flights daily to 55 international destinations.  
**MINNEAPOLIS:** 135 nonstop flights including 115 domestic and 20 international markets.

**13 COMMERCIAL PORTS**  
 Uniquely situated on the nation's greatest waterways, Wisconsin ships 39 million ton of product from commercial cargo ports and 6 limited cargo ports located along Lake Michigan, Lake Superior and the Mississippi River.

**03 FOREIGN TRADE ZONES (FTZ)**  
 Companies located in one of our three Foreign Trade Zones (FTZs) can import merchandise (by truck, rail, air or boat) without going through formal customs entry procedures or paying import duties. These companies have the option to pay tariffs after their product inventory is sold, improving cash flow and saving money. Other benefits include, but are not limited to: global market competitiveness, minimized bureaucratic regulations, and improved supply chain efficiencies.

# A PROUD LEGACY OF RESEARCH AND INNOVATION

The solutions emerging from Wisconsin's biohealth ecosystem are rooted in a long history of scientific discovery and innovation. Early in the 20th century, vitamins A and B were discovered at the University of Wisconsin-Madison, as was a method for enriching food with vitamin D to treat conditions including psoriasis and osteoporosis. Among many other transformative discoveries, the university-affiliated Wisconsin Alumni Research Association (WARF) holds the patent for the anticoagulant drug warfarin (named after the foundation, and sometimes sold under the brand name Coumadin®) taken by millions of Americans to lower their stroke risk.

It was at the Medical College of Wisconsin (MCW) that Lyme disease and its treatment options were first identified; it was also here that the first rapid, accurate test for lead poisoning was developed. More recently at MCW, researchers developed the functional magnetic resonance imaging (fMRI) technique for dynamic brain imaging that allows for real-time observation of changes in function and blood flow.

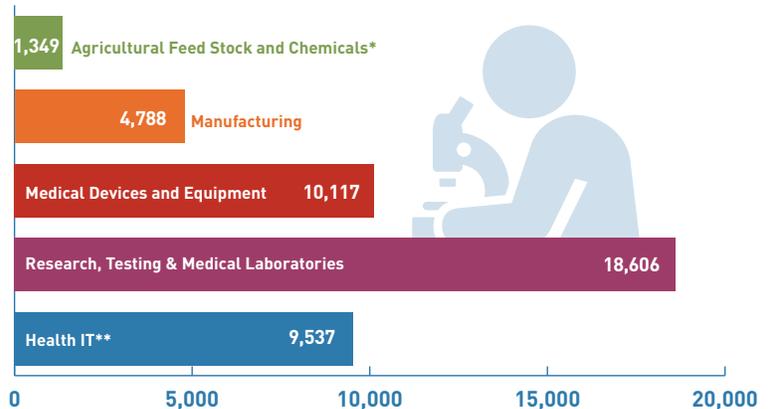
In 1998, one of the major milestones in the history of science took place at UW-Madison: developmental biologist James Thomson became the first in the world to isolate human embryonic stem cells and keep them alive indefinitely in culture. A decade later, Thomson's lab (concurrently with researchers in Japan) would develop a method for reverse engineering stem cells from human skin cells, thus avoiding the ethical considerations and debates involved with using cells from embryos. These "induced pluripotent stem cells" can be used to generate virtually all human cell types, with potential uses in regenerative medicine, drug screening and biomedical research.

Wisconsin is also home to a power player in the health technology space: Epic Systems. The market leader in electronic health records, with more than 190 million patients<sup>1</sup> served by its record systems, is based in Verona, just outside Madison.

The location of this strong industry leadership in Wisconsin has led to a critical mass of small and midsize companies in related fields also deciding to locate here.

<sup>1</sup> Epic Systems website, 2017

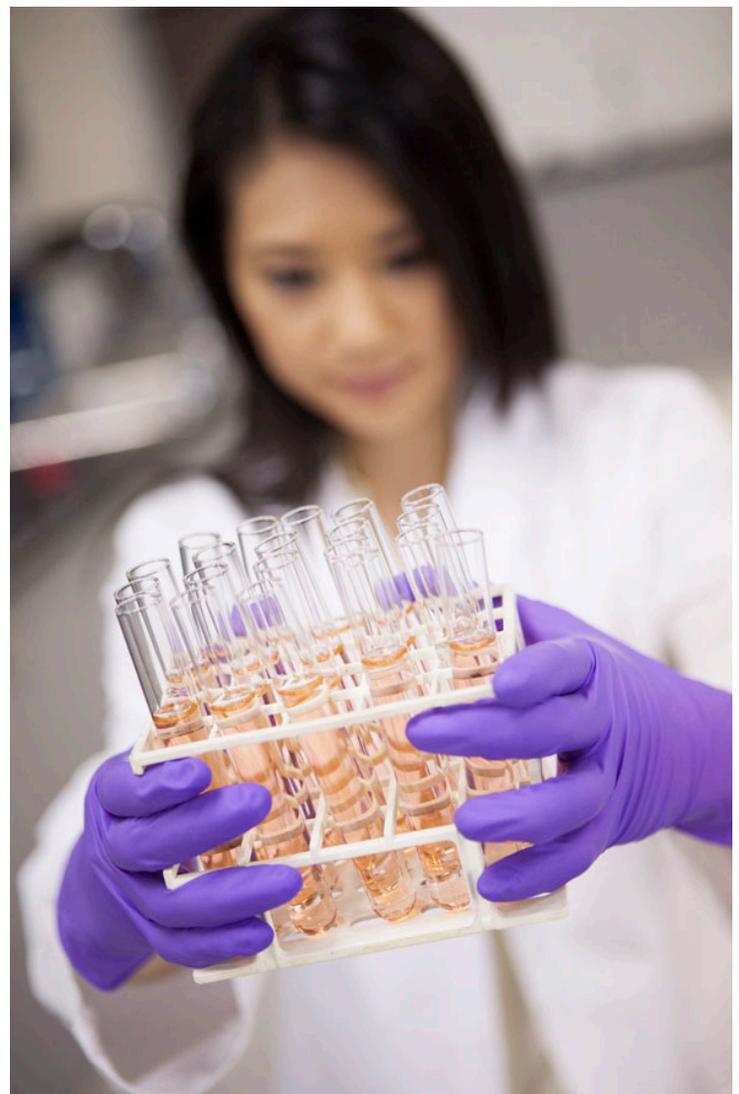
## BIOHEALTH JOBS IN WISCONSIN



\*Includes employee counts from EMSI and Infogroup

\*\*Infogroup employment numbers based on 82 selected companies

Source: EMSI Q2 2017 Dataset class of worker category, QCEW Employees 2015 Employment



# HOWEVER YOU DEFINE MANUFACTURING, WISCONSIN EXCELS



We build things in Wisconsin, and we're good at it. Wisconsin established its manufacturing excellence in the industrial age, and its leadership continues today. Wisconsin manufacturers benefit from an integrated, versatile and responsive supply chain that supports a diverse biohealth industry. All phases of manufacturing, from prototyping to sourcing components and ingredients, all the way to the final packaging, can be completed right here in Wisconsin.

Within the sphere of manufacturing, Wisconsin excels in the manufacturing of diagnostics, molecules, cells and tissues—a field known as biomanufacturing that is emerging as a substantial industry in the U.S. and globally. Active pharmaceutical ingredient (API) manufacturers such as Scientific Protein Labs, Alcami, SAFC and Catalent manufacture the molecules and compounds needed for discovering and testing new drugs, as well as molecules whose efficacy is well established. For example, Waunakee-based Scientific Protein Labs is among the largest commercial suppliers of heparin sodium, a widely used anticoagulant administered to treat and prevent blood clots. Ongoing stem cell research at UW-Madison and its

affiliated institutes has led to a concentration of companies that seek to use these cells therapeutically and commercialize those therapies.

Madison's inordinately large life science industry relative to its size, and its proximity to medical device and pharmaceutical hubs such as Minneapolis, Chicago and Indianapolis have made it a Midwest epicenter for biomanufacturing innovation. In addition, Wisconsin has a robust medical device manufacturing industry in its own right: Wisconsin exported \$2.3 billion worth of medical and scientific instruments in 2016,<sup>2</sup> making it the state's second-largest export category, and 158 medical device manufacturers are based in Wisconsin.<sup>3</sup>

In particular, Wisconsin ranks #1 in the nation for employment concentration for irradiation apparatus manufacturing. This industry employs more than 4,000 people in Wisconsin—a greater number than are employed in this industry in California, New York and Texas combined.<sup>4</sup>

<sup>2</sup> U.S. Census Bureau Foreign Trade Division data via WISERTrade, 2016  
<sup>3</sup> Infogroup

<sup>4</sup> Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Annual 2016 Employment

# GLOBAL LEADERSHIP

Biohealth products made in Wisconsin are helping improve people's health around the world, with 46 percent of all U.S. computed tomography apparatus exports coming from Wisconsin, as well as 51 percent of U.S. exports of adrenal cortical hormones and their derivatives. Wisconsin also leads the U.S. in the export of human and animal blood preparations and cultures (22 percent of U.S. exports).<sup>1</sup>

Due to Wisconsin's strength in multiple subsectors of biohealth, the state has become an attractive destination for foreign direct investment (FDI) and acquisition targets from multinational corporations. Wisconsin has many examples of startups that have grown into thriving companies before being purchased by global companies that wish to integrate the Wisconsin companies technology into their offerings.

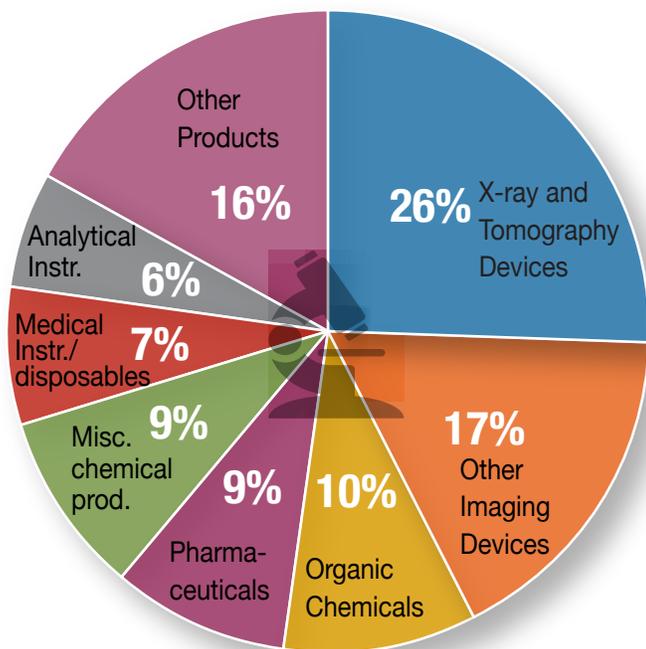
<sup>1</sup> U.S. Census Bureau Foreign Trade Division data via WISERTrade, 2016

An example of such an investment was the sale of Milwaukee-based Marquette Electronics to GE Healthcare in 1998 for \$808 million. At the time, the company was known as GE Medical Systems and was already the world's leading manufacturer of equipment for MRI and CT scans; the acquisition added heart monitoring machines to GE's product line.

Other examples of acquisitions of Wisconsin biohealth companies include:

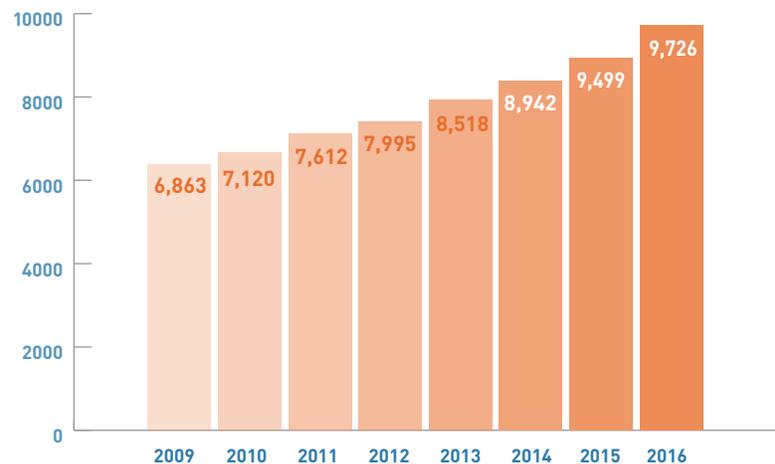
- **Agro Biosciences** (Church & Dwight)
- **Cellular Dynamics** (FUJIFILM)
- **MilliporeSigma** (Merck KGaA)
- **Neuwave Medical** (J&J)
- **NimbleGen Inc.** (Roche)
- **Scientific Protein Laboratories** (Hepalink)
- **Stratatech** (Mallinckrodt Pharmaceuticals)

## WISCONSIN'S BIOHEALTH EXPORTS



Source: U.S. Census Bureau Foreign Trade Division Data via WISERTrade, 2016

## UW SYSTEM STEM DEGREES AWARDED



Source: NCES IPEDS Database

WISCONSIN IS  
**ONE** OF ONLY TWO FULLY FUNDED STATE PENSION SYSTEMS IN THE U.S.

Source: Center for Retirement Research at Boston College, 2016

# CUTTING-EDGE ACADEMIC PROGRAMS AND INDUSTRY-ACADEMIC COLLABORATIONS

Biohealth companies in Wisconsin benefit from a vast array of assets and resources that exist to support the industry, above and beyond the fellowship that comes with a critical mass of companies doing related work.



The **UNIVERSITY OF WISCONSIN-MADISON** is an academic heavy-weight, with more

than 40,000 students and an annual budget of nearly \$3 billion. Founded in 1848, the university ranks in the top 10 for research spending nationally, and has for many years. It is home to more than 100 research centers, many of them in the biological and health sciences, and the university-affiliated WARF holds patents for more than 1,700 technologies.



The **MEDICAL COLLEGE OF WISCONSIN** (MCW) is a distinguished leader and innovator in the education and development of the next generation of physicians, scientists, pharmacists and health professionals.

Its mission includes discovering and translating new knowledge in the biomedical and health sciences; providing cutting-edge, collaborative patient care of the highest quality; and improving the health of the communities it serves. The school invests more than \$225 million in research each year, making it the second-largest research institution in Wisconsin. Among many other excellent programs, its newly launched school of pharmacy has the only three-year pharmacy program in the Midwest located at an academic medical center. The school also collaborates with Marquette University in a combined Department of Biomedical Engineering, allowing the department to draw on the strengths of both institutions.

**\$1 BILLION+** UW-MADISON INVESTS ANNUALLY IN RESEARCH AND DEVELOPMENT

Source: UW-Madison 2016-17 Budget in Brief



Founded in 1907, its **SCHOOL OF MEDICINE AND PUBLIC HEALTH**

(SMPH) is recognized across the state, nation and world as a leader in education, research and service. The school was the nation's first to fully integrate medicine and public health—a revolutionary synthesis that seeks to develop new approaches for not just diagnosing and treating but also preventing illness, focusing simultaneously at the level of the individual and of entire populations. The school has a long tradition of rapidly translating discovery into application.



As Wisconsin's only public urban research university, the **UNIVERSITY OF WISCONSIN-**

**MILWAUKEE** (UWM) has established an international reputation for excellence in research, community engagement, teaching and entrepreneurship. UWM educates 26,000 students and is an engine for innovation in southeastern Wisconsin. UWM proudly excels at serving a diverse student base—fully one-third are students of color, and more veterans attend UWM than any other school in Wisconsin. Due in large part to the efforts of the UWM Department of Chemistry, southeastern Wisconsin is considered a center of excellence for applied chemistry.

**IN 2016, WISCONSIN'S COLLEGES AND UNIVERSITIES AWARDED MORE THAN**

**4,000** ACADEMIC DEGREES

**IN ENGINEERING AND ENGINEERING TECHNOLOGY FIELDS, INCLUDING CERTIFICATES, ASSOCIATE DEGREES, BACHELOR'S AND ADVANCED DEGREES.**

Source: National IPEDS database published by the U.S. Department of Education's NCES



### Wisconsin Network for Health Research

UW Institute for Clinical and Translational Research

### The WISCONSIN NETWORK FOR HEALTH RESEARCH

is a partnership among UW-Madison SMPH, the Marshfield

Clinic Research Institute, Aurora Health Care and Gunderson Health System. Established in 2005, the network provides researchers with statewide reach and a diverse patient population, with potential access to more than 5 million patients. The network was established to promote statewide research and to assist in moving research results from bench to bedside by allowing investigators to perform clinical, translational, comparative effectiveness and health outcomes research across a variety of platforms.

## BUILDING A BETTER WORKFORCE



Founded in 1984 as a partnership between two Milwaukee hospitals, St. Luke's Medical Center and Good Samaritan Medical Center,

**AURORA HEALTH CARE** is an integrated nonprofit health care provider network serving communities throughout eastern Wisconsin and northern Illinois. In addition to a focus on community-based treatment and prevention, Aurora is committed to supporting research through the Center for Urban Population Health, a partnership with UW-Madison SMPH and UWM. Among this and other research centers, Aurora typically has more than 700 clinical research projects, including more than 400 clinical trials, under way.



### Marshfield Clinic

more than 6,000 additional employees. Its affiliated research institute has approximately 450 clinical trials and its Personalized Medicine Research Project, which with more than 20,000 participants, is one of the largest population-based genetic research projects in the U.S. Located in north central Wisconsin, Marshfield Clinic is one example of biohealth strength that spans the entire state, even beyond its major cities

**MARSHFIELD CLINIC**, one of only a few large, independent nonprofit medical clinics in the U.S., is the largest private group medical practice in Wisconsin and one of the largest in the U.S., with more than 700 physicians and



**MADISON COLLEGE** is contributing to this sector's growing workforce demands by offering a post-baccalaureate certificate in biotechnology.

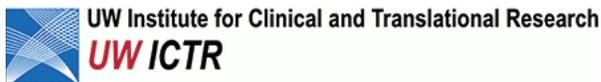
The college was also awarded a grant from the National Science Foundation to work collaboratively with City College of San Francisco to bring stem cell education into technical colleges, as well as middle and high schools, nationwide.

Many other institutions across Wisconsin—including **MILWAUKEE AREA TECHNICAL COLLEGE** and **WAUKESHA COUNTY TECHNICAL COLLEGE**—are educating the workforce of the future in health care, research and other biohealth careers. Notably, the **CONCORDIA UNIVERSITY WISCONSIN SCHOOL OF PHARMACY** offers a master's degree in product development—a unique program that was designed in close collaboration with private sector partners.



Founded in 1993, the **BIOPHARMACEUTICAL TECHNOLOGY CENTER**

**INSTITUTE** exists to offer training in biotechnology and biopharmaceutical manufacturing; promote the exchange of information among industry, educators and the general public; support the development of high-tech industries; facilitate science, technology, nature discovery and arts programs for children and young adults; encourage greater understanding of the creative process; and enable community organizations to offer educational and cultural programs.



Clinical & Translational Science Institute

Wisconsin has two translational research centers with funding from the National Institutes of Health: the **INSTITUTE FOR CLINICAL AND TRANSLATIONAL RESEARCH** at UW-Madison,

and the **CLINICAL AND TRANSLATIONAL SCIENCE INSTITUTE (CTSI)** at the Medical College of Wisconsin. CTSI is a consortium of eight Milwaukee area institutions dedicated to transforming biomedical research:

- Marquette University
- Milwaukee School of Engineering
- University of Wisconsin- Milwaukee
- Medical College of Wisconsin
- Froedtert Health
- Children's Hospital of Wisconsin
- The Milwaukee Veterans' Administration
- Blood Center of Wisconsin

CTSI's research portfolio currently supports more than 1,000 researchers and more than 200 clinical trials.



The **UWM RESEARCH FOUNDATION** supports research and innovation through scholarship and grant funding, and through the facilitation of university-corporate partnerships.



With a vision of enabling UW-Madison research to solve the world's problems, the

**WISCONSIN ALUMNI RESEARCH**

**FOUNDATION (WARF)** supports scientific research within the UW-Madison community by providing financial support, actively managing assets, and moving innovations to the marketplace for a financial return and global impact. WARF invests in the university by partnering with UW-Madison to steward the cycle of research, discovery, commercialization and investment. Founded in 1925 by visionary alumni, WARF is among the oldest and most successful technology transfer offices in the nation. As the designated patent and licensing organization for UW-Madison, WARF advances transformative discoveries to the marketplace to benefit humankind across Wisconsin and the world.

In addition, technology transfer offices at the **WISCONSIN SYSTEM TECHNOLOGY FOUNDATION, MEDICAL COLLEGE OF WISCONSIN, MARQUETTE UNIVERSITY** and the **BLOOD CENTER OF WISCONSIN** provide assistance for researchers and inventors to commercialize their discoveries, helping to ensure that scientific breakthroughs reach their potential to save and enhance lives.



Established in 1984, the UW-Madison-affiliated

**UNIVERSITY RESEARCH PARK** is an internationally recognized research and technology park that supports early-stage and growth-oriented businesses in a wide range of sectors, including engineering, computational and life sciences. The research park spans 255 acres and is home to more than 125 companies that together employ about 3,800 workers. Above and beyond the role of an average office park, the research park supports programs and events that leverage the university's strengths and contribute to the local technology ecosystem.



Within the research park, the **MADISON GAS & ELECTRIC INNOVATION CENTER** serves as a technology incubator, offering unique opportunities and incentives for startups in a specialized growth environment. Since 1989, more than 70 early-stage companies have taken advantage of the office and laboratory space, benefiting from the center's top-flight equipment, amenities and community.

Milwaukee's **TECHNOLOGY INNOVATION CENTER AT RESEARCH PARK** is a community of constant innovation, where ideas flow out of laboratories and into the forefront and where entrepreneurs drive the innovations that move us all ahead. The Technology Innovation Center provides its exceptional community of entrepreneurs with the environment, the support and resources they need—not just to grow, but to thrive.

The **UW-MADISON BIOTECHNOLOGY CENTER** offers state-of-the-art research services with competitive user fees. Services offered include DNA synthesis and sequencing, peptide synthesis, peptide sequencing and mass spectrometry of phosphopeptides and small metabolites, production of transgenic/knockout mice and rats, education programs and multimedia technology resources.



**MORGRIDGE**  
INSTITUTE FOR RESEARCH

The **MORGRIDGE INSTITUTE FOR RESEARCH** is an independent biomedical institute exploring uncharted

scientific territory to discover tomorrow's cures. Using mechanisms unique to a private institute, it helps UW-Madison recruit top scientific talent, build powerful research collaborations and provide shared resources to bolster university science. Its research focus areas include bioethics, core computation, medical engineering, metabolism, regenerative biology and virology.



**Center for Predictive Computational Phenotyping**

UW-Madison's **CENTER FOR PREDICTIVE COMPUTATIONAL PHENOTYPING** is developing innovative computational and statistical methods and software for a broad range of problems that can be cast as computational phenotyping. The center investigates how to exploit a wide array of data types for these tasks, including molecular profiles, medical images, electronic health records and population-level data. The center also provides training in biomedical "big data" analysis to scientists and clinicians, and is investigating the bioethical issues surrounding the development of this technology.



UWM's **INSTITUTE FOR DRUG DISCOVERY** was established to advance research and later-stage

development of new drugs from research at the university and its collaborating institutions in areas including neuroscience, cancer and infectious diseases. Its capabilities include organic compound synthesis, medicinal chemistry and drug design, metallo-chemistry, drug compound SAR, diversity synthesis, analytical chemistry, enzymology, natural products chemistry, cell-based assay development, high-throughput screening, molecular biology, fermentation and protein separations, and x-ray crystallography.

Once completed, the new **ATHLETIC PERFORMANCE RESEARCH CENTER**, a partnership between Aurora and Marquette University, will serve as a central hub for research in emerging fields including exercise physiology, athletic training, biomedical engineering, nutrition and rehabilitation.

# A THRIVING ECOSYSTEM FOR BIOHEALTH ENTREPRENEURSHIP

When it comes to biohealth, Wisconsin's competitive advantage stems from the existence of not only a rich ecosystem of companies and researchers, but also a highly integrated economic development network to ensure that innovations are successfully brought to market.



The **I-CORPS PROGRAM**, a joint project of five Milwaukee universities with funding from the National Science Foundation,

works to foster commercialization of applied academic research and faculty/student innovation; build an innovation/commercialization network that supports faculty and/or student ventures; and broaden the pool of students and faculty fluent in Lean LaunchPad methodology.



The **WEINERT CENTER FOR ENTREPRENEURSHIP** at the UW-Madison Wisconsin School of Business aims to improve society and the lives of the school's students with a focus on launching entrepreneurial ventures and helping them navigate crucial transitions; evaluating and managing the risks of funding startup and early-stage companies; understanding and influencing local, state and national public policies that facilitate successful entrepreneurship moving science and knowledge into entrepreneurial ventures; and using for-profit ventures to accomplish social goals.



**LUBAR ENTREPRENEURSHIP CENTER**

UWM's

planned **LUBAR ENTREPRENEURSHIP CENTER** will be a 20,000-square-foot space for co-working and collaboration, flexible instruction, innovation labs and "maker" spaces, and touchdown and launch space for companies.



College of Business Administration  
Kohler Center for Entrepreneurship

At Marquette University, students have access to the **KOHLER CENTER FOR ENTREPRENEURSHIP**, which helps them develop entrepreneurial skills through a combination of mentoring, workshops and speakers, funding opportunities and community partnerships.



Photo courtesy of the Biopharmaceutical Technology Center Institute

**LAW AND ENTREPRENEURSHIP CLINICS** at UW-Madison and Marquette University provide pro bono assistance to help entrepreneurs navigate the legal issues associated with starting their companies and commercializing their ideas.

The Wisconsin Economic Development Corporation (WEDC) certifies companies as **QUALIFIED NEW BUSINESS VENTURES**, allowing them to attract investment more easily since investors can receive tax credits for the amount they invest in certified companies. WEDC also offers **TECHNOLOGY DEVELOPMENT LOANS** to help companies clear the hurdles associated with bringing new technologies, products and concepts to market.

Through the **CAPITAL CATALYST PROGRAM**, WEDC makes seed grants available to highly structured and well-funded organizations that are dedicated to stimulating entrepreneurship—including, notably, **Bridge to Cures**, a Milwaukee-based organization that focuses on innovations with the potential to address unmet medical needs.



Through UW-Extension's **CENTER FOR TECHNOLOGY COMMERCIALIZATION**, WEDC also

supports Entrepreneurial Micro-grants that can be used to obtain the services of a qualified provider for the purpose of developing an application for a federal Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) grant, as well as matching grants for SBIR/STTR funding to cover costs that are not covered by the federal grants.



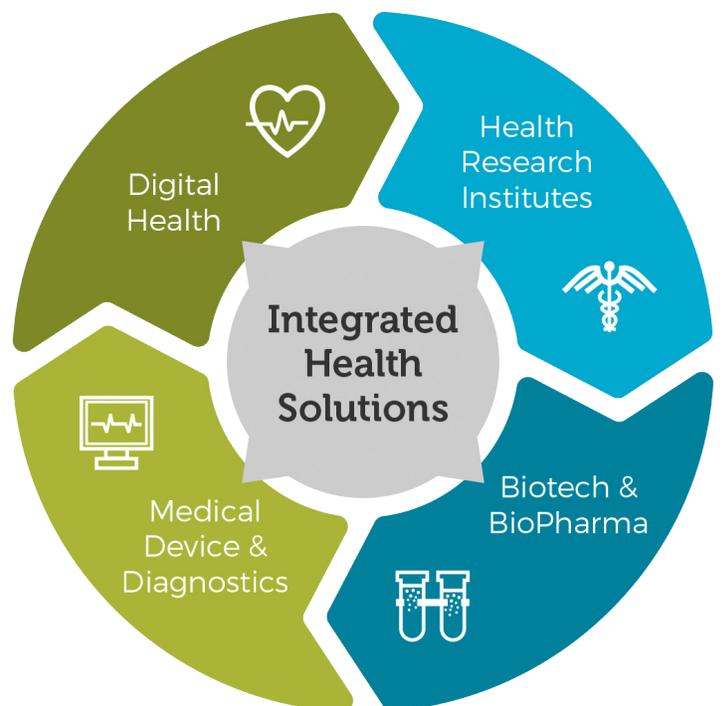
# BOOSTING THE BIOHEALTH SECTOR



Biohealth companies in Wisconsin benefit from the presence of BioForward, a sector development and advocacy organization with more than 200 member companies.

BioForward serves as the independent voice of Wisconsin's biohealth industry, supporting members and the entire sector through networking events, legislative advocacy, marketing and educational programming.

A particular focus is working to attract the next generation of talent by articulating the benefits of Wisconsin's biohealth industry, the impact on their careers, and the potential to make an impact through their work.



# WISCONSIN BIOHEALTH COMPANIES

## GE HEALTHCARE

Waukesha, Wauwatosa, Milwaukee,  
West Milwaukee, Oak Creek, Madison, Pewaukee



GE Healthcare is an \$18 billion unit of General Electric Co., employing more than 52,000 people worldwide and serving health care professionals in more than 100 countries. The company's imaging and clinical care practices, which include ultrasound, magnetic resonance imaging (MRI), computed tomography (CT), patient monitoring, maternal-infant care and X-Ray technologies, are headquartered in Wisconsin, where the largest concentration of GE Healthcare's workforce—6,000 employees—is located. In total, the ripple effect of GE Healthcare supports more than 20,000 jobs in Wisconsin through its supply chain participants in the state.

GE Healthcare's Wisconsin employees have collectively earned nearly 3,000 engineering degrees, many from Wisconsin institutions that work collaboratively with the state's businesses to ensure that the skills taught match industry needs. To meet the rising demand for science, technology, engineering and mathematics (STEM) graduates, Wisconsin has steadily increased the number of degree holders in these fields, with significant growth in programs not only at the University of Wisconsin-Madison and other UW System schools, but also in the state's technical colleges. The growth rate for Wisconsin's pool of graduates is especially high in computer and information sciences and support services, a positive trend for GE Healthcare, which plans to add about 5,000 software engineers globally in the next several years to support a broad push toward digitization.

## PROMEGA

Fitchburg



With a portfolio of more than 3,500 products covering the fields of genomics, protein analysis, cellular analysis, drug discovery, and genetic identity, Promega is a global leader in providing innovative solutions and technical support to life scientists in academic, industrial and government settings.

Promega products are used by life scientists who are asking fundamental questions about biological processes, as well as by scientists who are applying scientific knowledge to diagnose and treat diseases, discover new therapeutics, and use genetics and DNA testing for human identification.

Promega holds significant intellectual property rights and licenses in several key areas that form a foundation for its diverse portfolio, including bioluminescence (including engineered luciferases, luciferase reporter vectors and luciferase substrates); short tandem repeat (STR) detection for cell line authentication, human identification, cell and tissue characterization, and mixed sample detection; and HaloTag® protein labeling and capture technology.

Founded in 1978 in Fitchburg and still headquartered there, Promega has branches in 16 countries, and has more than 50 global distributors serving 100 countries. A cornerstone of Promega business practice is supporting customers, community and employees.

# WISCONSIN

## DOHMEN LIFE SCIENCE SERVICES Milwaukee



In 1858, Dohmen opened as a small apothecary in Milwaukee's Third Ward. Nearly 160 years later, Dohmen has grown to a portfolio of companies, each serving a unique role in the company's vision to create a more efficient, effective and easy-to-use health experience. A trusted partner to hundreds of clients from Fortune 500 companies to startups, Dohmen now has more than 1,000 employees and operates from over 1 million square feet of space across seven states.

Dohmen's largest division, Dohmen Life Science Services (DLSS), is the leading business process outsourcing partner to pharmaceutical and biologics companies. Whether it's navigating regulatory requirements during a clinical trial, launching new products or providing patient-centric care in support of products for a rare disease, DLSS helps drug manufacturers build patient relationships, create economic value, achieve operational excellence and reduce risk with compliance, finance, technology, and patient and supply chain services.

Red Arrow, a Dohmen company also headquartered in Milwaukee, creates transformative technology for life science and health care organizations. With in-market software, including the HORIZON laboratory information management system, and groundbreaking technology innovations such as Compass-PRM, a patient relationship management tool for companies with rare disease products, Red Arrow's products promise to create efficiencies and ease of use in health care.

## EXACT SCIENCES Madison



Exact Sciences is a molecular diagnostics company committed to playing a role in the eradication of colorectal cancer, the second-deadliest type of cancer in the U.S. As part of this mission, Exact Sciences developed Cologuard, the first noninvasive screening test for colorectal cancer that analyzes both DNA and blood biomarkers in a stool sample. Available by prescription through health care providers, Cologuard offers people 50 and older with average levels of colorectal cancer risk a non-invasive, easy-to-use screening option.

Colorectal cancer is among the most preventable cancers, yet is also among the least detected: more than one in three Americans eligible for screening are not current with the recommended guidelines. With Cologuard, Exact Sciences seeks to change this by offering a screening option that can be used in the privacy and comfort of a patient's home. Recognizing the potential for Cologuard to change lives, the U.S. Centers for Medicare and Medicaid Services and the Food and Drug Administration reviewed the product concurrently, an unprecedented pathway to approval and coverage for Medicare beneficiaries.

Since relocating to Wisconsin in 2009, Exact Sciences has grown from three employees to a team of more than 1,000. In 2016, the company's Madison-based lab completed more than 240,000 Cologuard tests, and in 2017 it expects to complete more than 470,000 Cologuard tests. Building on its proprietary technology platform and partnership with the Mayo Clinic, Exact Sciences is now working to bring new cancer screening tests to patients, including a blood-based test for lung cancer.

# BIOHEALTH COMPANIES

## LUCIGEN CORP.

Middleton



Lucigen Corp. works to improve people's lives by providing quality products and services to life science and health care professionals. Core competencies include enzyme evolution, protein expression, cloning, cellular engineering, next-generation sequencing, and molecular diagnostics.

Lucigen discovers, manufactures and commercializes molecular biology and biochemical products used across the spectrum from basic and applied research to molecular diagnostics, selling to academic, agricultural, government, biotech and pharmaceutical researchers around the world. It also offers product customization for customers, diagnostic companies and original equipment manufacturer (OEM) partners. Lucigen prides itself on being fast, flexible and responsive, handling planning and logistics so its customers can get to market faster, reduce development costs and focus on their core research.

Lucigen's products are sold in more than 50 countries around the world, and it is focused on further global growth. Because of its excellence in development of business on a global scale, the company received the Wisconsin Governor's Export Achievement Award and the U.S. President's E Award for Exporting in 2017.

## PHILLIPS-MEDISIZE

Hudson, New Richmond, Menomonie, Phillips, Medford, Eau Claire



Phillips-Medisize is a global leader in outsource design, development and technology-driven manufacturing. With unparalleled experience in advanced molding and assembly, Phillips-Medisize has become a dominant force in the medical device and diagnostics, drug delivery, primary pharmaceutical packaging, and commercial markets. The company has 85 percent of its total revenue coming from drug delivery, medical device and diagnostic products such as disposable insulin pens, glucose meters, specialty inhalation drug delivery devices, single-use surgical devices and consumable diagnostic components.

Phillips-Medisize's customers include blue chip medical device, pharmaceutical and commercial firms. The company partners with its customers to provide design and development services that accelerate speed-to-market of innovative products and works with customers to deploy advanced automated assembly and quality control technologies that reduce manufacturing cost while improving quality.

Phillips-Medisize is headquartered in Hudson, Wisconsin, and employs over 5,400 people in 21 locations throughout the U.S., Mexico, China and Europe. Over 2,000 of these employees are in Wisconsin; in 2015, the company embarked on a \$30 million expansion at its Wisconsin facilities. Company executives say Wisconsin's skilled workforce and friendly business climate have helped Phillips-Medisize succeed on a global scale.

The Wisconsin Economic Development Corporation (WEDC) leads economic development efforts for the state by advancing and maximizing opportunities in Wisconsin for businesses, communities and people to thrive in a globally competitive environment. WEDC provides resources, operational support and financial assistance to companies, partners and communities in Wisconsin. WEDC achieves its mission through initiatives driven by five strategic pillars: business development; community and economic opportunity; strategic economic competitiveness; state brand management and promotion; and operational and fiscal excellence. Working with more than 600 regional and local partners, WEDC develops and delivers solutions representative of a highly responsive and coordinated economic development network.

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