

WIN.WIN.WIN.

UB Business and Entrepreneur Partnerships Impact Study 2017

**That's the power
of partnerships**



University at Buffalo

Business and Entrepreneur
Partnerships



Center of
Excellence
in Materials
Informatics
(CMI)



Buffalo Institute
for Genomics
and Data
Analytics (BIG)



Center for Advanced
Technology in Big Data
and Health Sciences
(UB CAT)

Connect. Commercialize. Grow.



University at Buffalo
Business and Entrepreneur
Partnerships



Center of Excellence
in Bioinformatics and
Life Sciences (CBLS)



START-UP NY



Center for
Computational
Research (CCR)



WNY Incubator
Network (WIN)

WIN.
It's a win for industry.

WIN.
It's a win for UB.

WIN.
It's a win for the region
and beyond.



10 Where it happens

6 How we build winning partnerships



26

What winning partnerships look like





UB Business and Entrepreneur Partnerships

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Prepared by



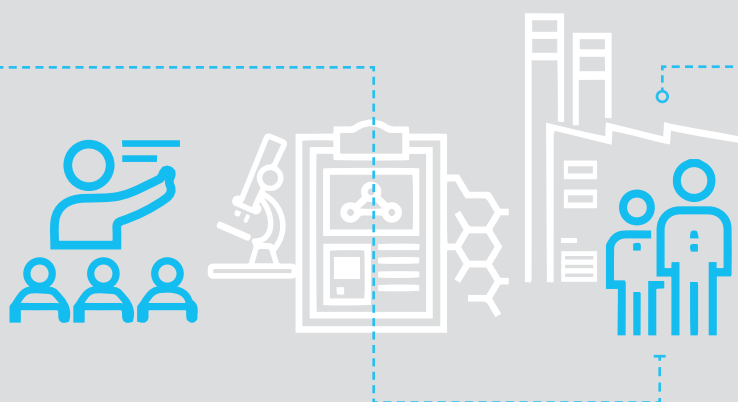
School of Architecture and Planning
UB Regional Institute

How we build winning partnerships

Together we work to earn everyday victories thanks to our business-friendly approach.

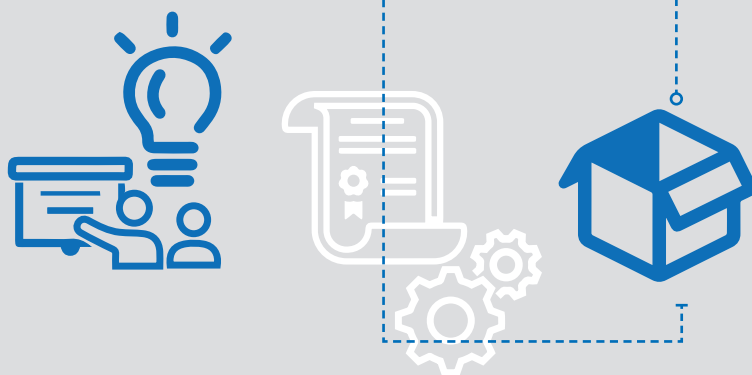
Connect.

Engage faculty and students with industry to collaborate on research, business development and experiential learning.



Commercialize.

Support the commercialization of inventions to drive them from idea to market.



Grow.

Enable NYS startups and existing businesses to grow.



To talent, state-of-the-art equipment, and world-class researchers.

With business expertise, entrepreneurial support and funds.

By leveraging resources and knowledge from UB.

The University at Buffalo's **Business and Entrepreneur Partnerships** team, a division of the Office of Research & Economic Development, works to enable and nurture the innovation economy. We serve as the bridge between academia and industry supporting partnerships to commercialize new technology, advance existing technology and provide pathways for students to experiential learning and jobs. With new programs, policies and incentives focused on facilitating industry engagement and technology commercialization, we make it **easy** to partner — a **win-win** for all involved.

Our centers and programs

Center of Excellence in Bioinformatics and Life Sciences (CBLS)

Center of Excellence in Materials Informatics (CMI)

Center for Computational Research (CCR), *NYS High Performance Computing Consortium*

Center for Advanced Technology in Big Data and Health Sciences (UB CAT)

Buffalo Institute for Genomics and Data Analytics (BIG)

WNY Incubator Network (WIN), *NYS Innovation Hot Spot*

START-UP NY

Hundreds of companies have partnered with us to connect, commercialize and grow their business...

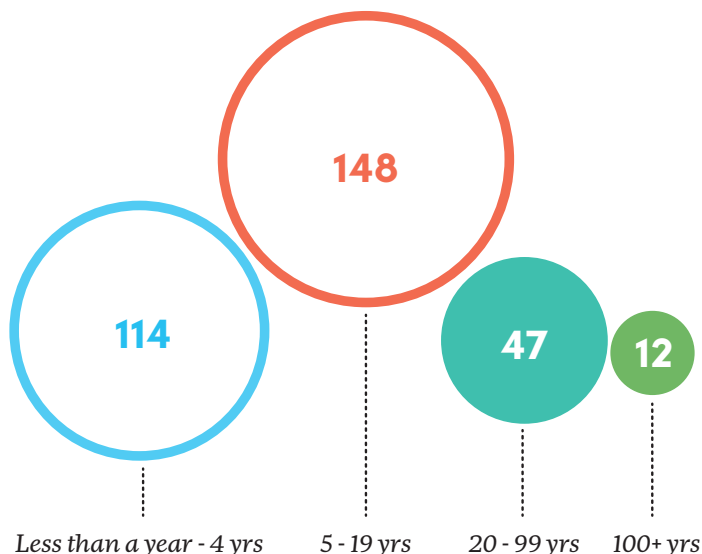
380+
industry partners
since 2012

...with plenty of everyday victories along the way.

No matter the size, age or industry, we want to see our partners succeed. For some companies that means connecting them to equipment and facilities, for others it's helping them advance their technology products through faculty expertise.

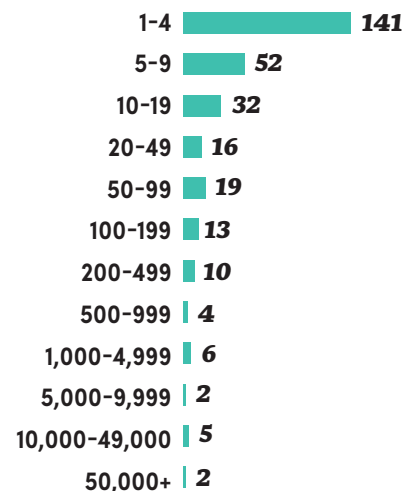
Many of our industry partners are young.

INDUSTRY PARTNERS
BY AGE



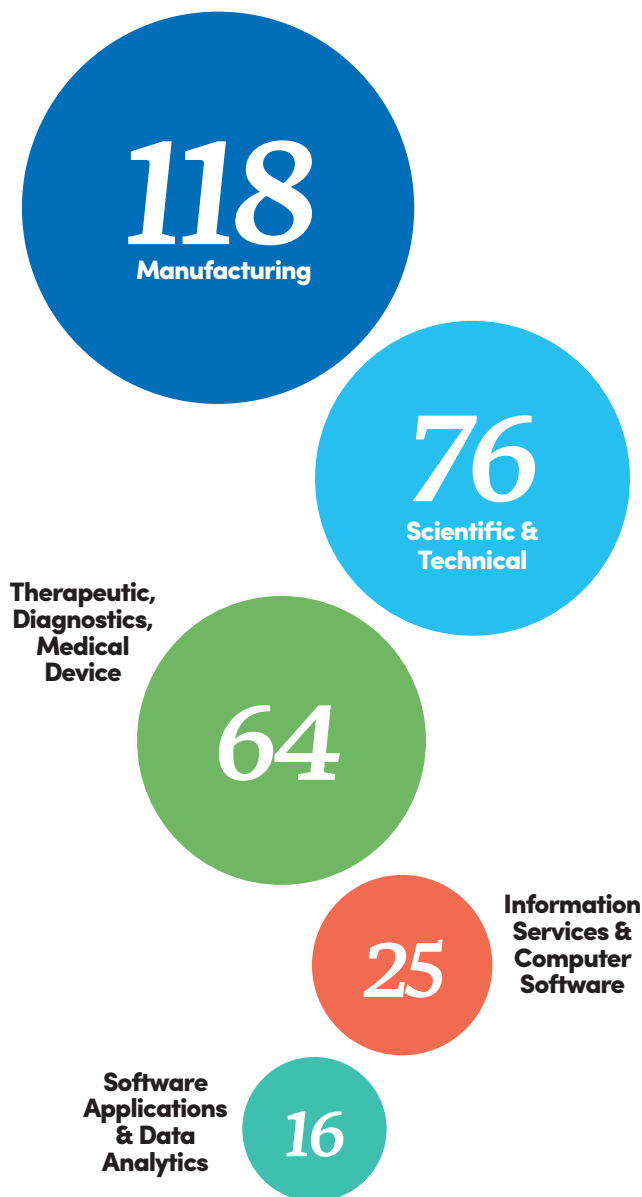
Most of our partner companies are small to mid-sized.

INDUSTRY PARTNERS
BY NUMBER OF EMPLOYEES



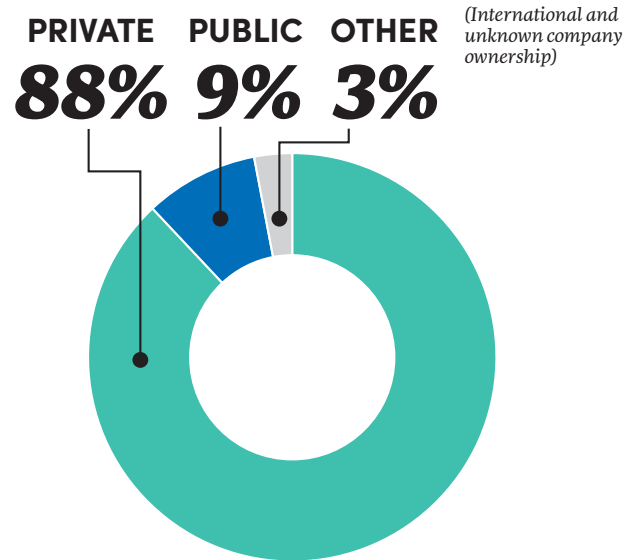
We help companies across sectors, especially in manufacturing.

**INDUSTRY PARTNERS
BY INDUSTRY**



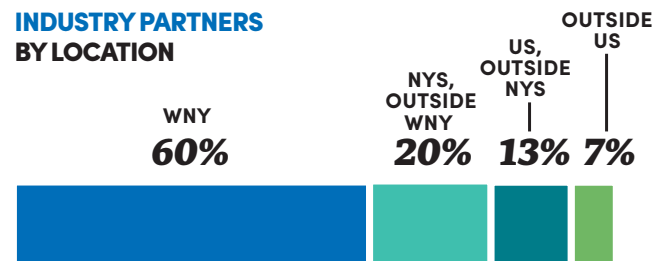
The majority of our industry partners are privately owned.

**INDUSTRY PARTNERS
BY OWNERSHIP**



Our industry partners are primarily in NYS, with more than half in WNY.

**INDUSTRY PARTNERS
BY LOCATION**



Data Source: Data on companies reflects findings from a company partner survey conducted in 2017 for the 2016-2017 fiscal year. Data from D&B Hoovers and Infogroup Inc. was also used to supplement survey findings.

Where it happens

Our centers, programs and people.
Ready to win you over.

We can connect you to faculty expertise, cutting edge technology, incubation space, mentoring, funding resources and networking to grow your business.



**Center of Excellence in
Bioinformatics and Life
Sciences (CBLS)**



**Center of Excellence in
Materials Informatics
(CMI)**



**Center for
Computational
Research (CCR)**



**Center for Advanced
Technology in Big Data
and Health Sciences
(UB CAT)**

When you win, we win.
Ready for a victory?



**Buffalo Institute for
Genomics and Data
Analytics (BIG)**



**WNY Incubator
Network (WIN)**



START-UP NY

From mature companies to innovative startups, some of the world's leading life sciences companies choose to partner with CBLS.

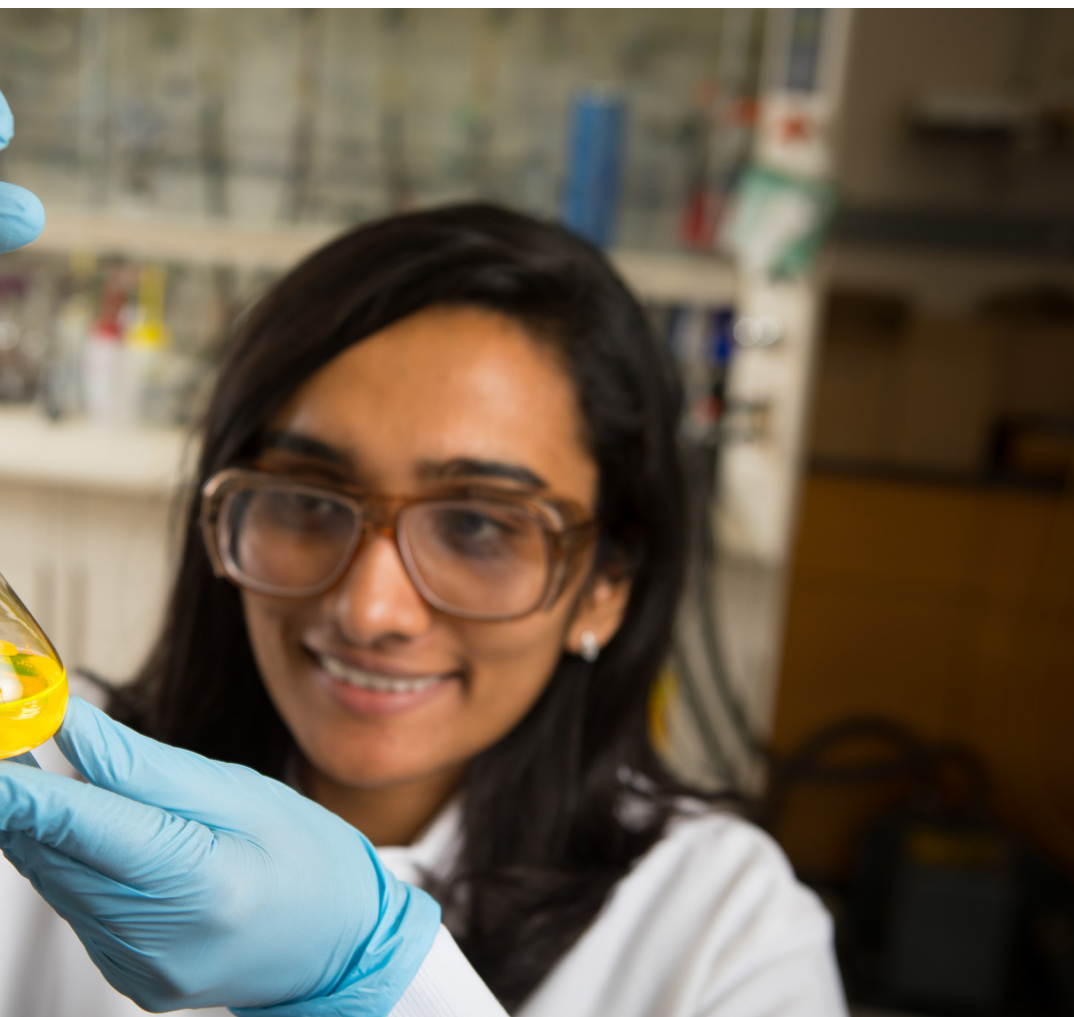
We're on a mission to foster new biomedical discoveries by connecting academia and industry.

CBLS is a catalyst for life sciences innovation and commercialization. Our assets include faculty and staff and some of the latest equipment and technology in the Western New York region for research, including the Center for Computational Research, the Genomics and Bioinformatics Core, and the Proteomics and Bioanalysis Core. It is a hub for the region's growing life sciences industry cluster and supports the entrepreneurial ecosystem while cultivating collaborative opportunities among UB faculty, students, clinicians and industry. The Center is a focal point for our startup community and welcomes those with new ideas looking to engage with the university. It also serves as a hub for students exploring STEM through K-12 outreach programs. CBLS is one of 12 New York State Centers of Excellence.



Connect to Expertise, Equipment and Facilities

- 25,000 square feet of BSL2 lab space
- Industrial chemistry hoods
- Genomics and Bioinformatics Core
- Proteomics and Bioanalysis Core
- ISO 7 Certified Clean Room
- Shared Equipment and Software
- High-Performance Computing
- START-UP NY Designated Space



What winning partnerships with industry looked like in fiscal year 2016-17:

A WIN FOR INDUSTRY

\$41.9M

Funding Raised
(from federal, state or non-governmental funds)

A WIN FOR NYS

Total Employment in NYS

1,087 jobs

Including

239 new jobs

Spending in NYS

\$23.2M

A WIN FOR UB

Faculty gain access to industry resources, knowledge and critical collaboration that drives breakthroughs for licensing or investment. Students gain hands-on experience, preparing them for the workforce.

Source: Data reflects findings from a survey of 42 company partners conducted in 2017 that collected economic impact data for the 2016-17 fiscal year relating to their interaction with UB Business and Entrepreneurship Partnerships' centers and programs.

Funding Raised reflects the total federal, state, or non-governmental funding raised by companies (not including revenue from the sale of goods or services). Jobs Supported reflects full-time equivalent employment at industry partners who are living in New York State. (1 full time job=1 FTE, 1 part time job =0.5 FTE) New Jobs reflect permanent, full-time positions created as a result of business expansion resulting from UB program efforts. Spending in NYS reflects estimated spending by industry partners on the purchase of goods and services in NYS excluding payroll.

Companies collaborate with CMI to solve R&D problems, discover new materials and processing methods and create high-technology jobs.

We're on a mission to leverage innovative materials science, big data analytics and advanced manufacturing expertise to drive critical research and development activities that support industry growth.

CMI is a network of over 100 UB faculty members engaged in innovative materials-related research with broad applications, including new techniques for 3D printing of metals, safer and longer lasting hip implants, low-cost solar cells and more. The Center's scientists and engineers work directly with industry partners to solve R&D problems and discover new materials and processing methods. Through CMI, businesses have access to UB's faculty expertise, advanced scientific and engineering equipment, funding resources and student interns. CMI is one of 12 New York State Centers of Excellence.



Connect to Expertise, Equipment and Facilities

Shared Equipment and Software

High-Performance Computing

Research Areas

Biological and Biomedical
Materials and Devices

Continuum and Multiscale
Modeling

Data Analytics and Machine
Learning

Digital and Additive
Manufacturing

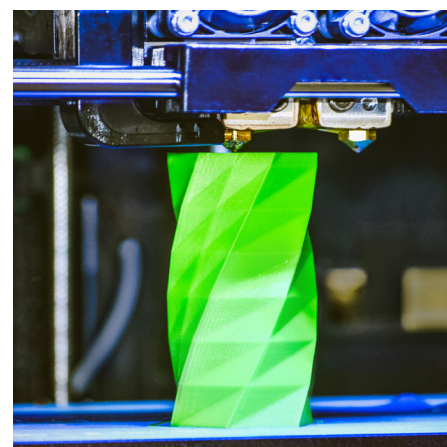
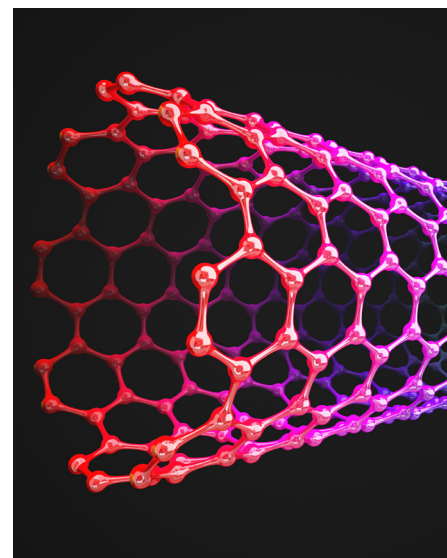
Inorganic Materials Synthesis
and Processing

Materials Characterization and
Spectroscopy

Photonic and Electronics Devices

Polymeric and Macromolecular
Materials Synthesis and
Processing

Quantum, Atomistic and
Molecular Modeling



What winning partnerships with industry looked like in fiscal year 2016-17:

A WIN FOR INDUSTRY

\$60.5M

Funding Raised
(from federal, state or non-governmental funds)

A WIN FOR NYS

Total Employment in NYS

129 jobs

Including

31 new jobs

Spending in NYS

\$11.6M

A WIN FOR UB

Faculty become engaged in industrial research and development projects and build critical collaborations through seed grant projects that help faculty secure larger federal grants and sustained industrial support for research.

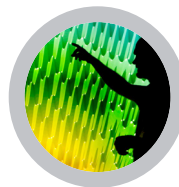
Source: Data reflects findings from a survey of 20 company partners conducted in 2017 that collected economic impact data for the 2016-17 fiscal year relating to their interaction with UB Business and Entrepreneurship Partnerships' centers and programs.

Funding Raised reflects the total federal, state, or non-governmental funding raised by companies (not including revenue from the sale of goods or services). Jobs Supported reflects full-time equivalent employment at industry partners who are living in New York State. (1 full time job=1 FTE, 1 part time job =0.5 FTE) New Jobs reflect permanent, full-time positions created as a result of business expansion resulting from UB program efforts. Spending in NYS reflects estimated spending by industry partners on the purchase of goods and services in NYS excluding payroll.

For expertise in advanced computing and data analytics, companies partner with CCR.

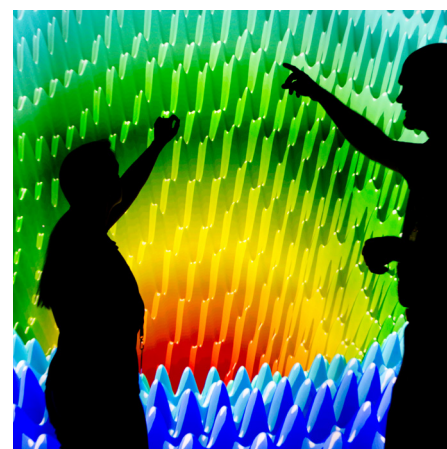
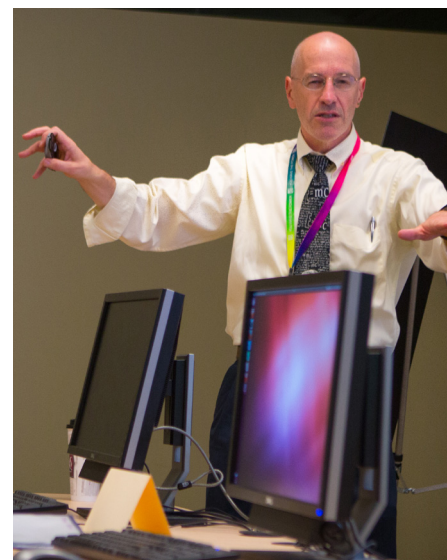
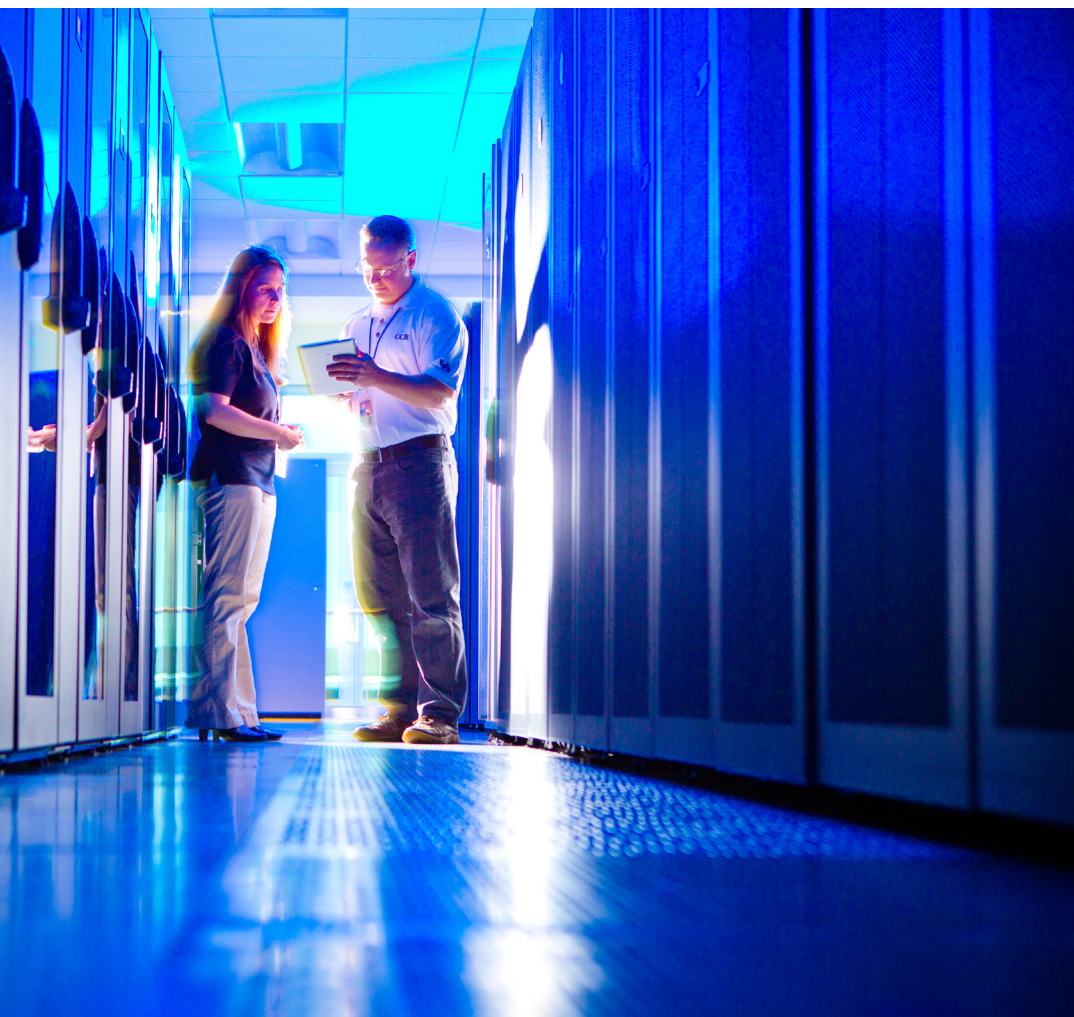
**We're on a mission
to help companies
grow by enabling
data-driven
discovery and
analysis.**

CCR maintains a world-class computing infrastructure for NYS companies and faculty. The Center's computational scientists and software engineers are experts in modeling and simulation, software engineering, bioinformatics, machine learning, data analytics, parallel computing and medical visualization. CCR provides NYS businesses access to advanced computing resources to help them innovate, reduce time to market and support their R&D activities. The Center also offers educational programs like a summer workshop for high school students, and higher-level training in areas such as parallel computing, data analytics, R, and Python programming.



Connect to Expertise, Equipment and Facilities

Computing Resources & Infrastructure
Computational Scientists & Software Engineers
High-Performance Computing
High-Speed Networking
Modeling & Simulation
Machine Learning
Data Warehouse & Analytics



What public-private partnership wins look like:

VADER SYSTEMS

3D printer manufacturer

VADER

By collaborating with UB, Vader Systems accessed expertise and state-of-the-art computational electromagnetic and fluid dynamic (CFD) modeling capabilities needed to help optimize performance of the Vader Systems 3D printer. The results generated include simulations to form 3D printed structures and new methods for monitoring and controlling the 3D printing process. This work has supported the creation and commercialization of the Vader Systems' technology.

SENTIENT SCIENCE

Digital platforms used to enhance operational efficiencies



CCR is a key partner for Sentient Science, enabling the company to deploy their models and services to commercial and government customers. The Center provides access to its supercomputing infrastructure to host the computationally demanding DigitalClone models and run simulations, which allows Sentient Science to rapidly scale to meet increased commercial demand. This capability has led to a series of commercial tools and services to help manufacturers and operators of rotating equipment predict and extend their products' life and performance.

UB CAT provides matching grants for faculty and industry to collaborate on big data projects in health sciences.

We're on a mission to help NYS life sciences companies bring their technologies to market.

NYS companies and UB researchers can partner to access funding for collaborative projects focused on the intersection of big data and health sciences. Applied research and R&D projects supported by the CAT enable industry partners to tap into UB's outstanding faculty expertise and facilities to take their product or technology to the next step on the path to commercialization. In addition to projects related to healthcare IT, diagnostic, drug or medical device development, the CAT also facilitates programming geared toward entrepreneurs, workforce development, and technology transfer. The UB CAT is one of 15 competitively awarded Centers for Advanced Technology in New York State, dedicated to leveraging university resources to drive economic growth through strategic technology-based industry sectors.



Connect to the UB CAT Technology Focus Areas

Healthcare / IT
Diagnostics
Drug development
Medical device development



What winning partnerships with industry looked like in fiscal year 2016-17:

A WIN FOR INDUSTRY

\$52.5M

Funding Raised
(from federal, state or non-governmental funds)

A WIN FOR NYS

Total Employment in NYS

403 jobs

Including

114 new jobs

Spending in NYS

\$20.4M

A WIN FOR UB

From 2007-2018, CAT has funded projects with 80 companies and engaged 74 faculty members to advance their technologies and commercialize new products.

Source: Data reflects findings from a survey of 24 company partners conducted in 2017 that collected economic impact data for the 2016-17 fiscal year relating to their interaction with UB Business and Entrepreneurship Partnerships' centers and programs.

Funding Raised reflects the total federal, state, or non-governmental funding raised by companies (not including revenue from the sale of goods or services). Jobs Supported reflects full-time equivalent employment at industry partners who are living in New York State. (1 full time job=1 FTE, 1 part time job =0.5 FTE) New Jobs reflect permanent, full-time positions created as a result of business expansion resulting from UB program efforts. Spending in NYS reflects estimated spending by industry partners on the purchase of goods and services in NYS excluding payroll.

From startups to large companies, BIG catalyzes growth by providing access to technical expertise, specialized equipment and data analysis capabilities.

We're on a mission to put NYS at the center of the intersection of life sciences and big data by promoting public-private partnerships.

The Buffalo Institute for Genomics & Data Analytics (BIG) is a strategic economic development initiative supported by New York State. BIG catalyzes the growth of Buffalo-based big data and life sciences companies by partnering with industry interested in: a) externalizing specific R&D challenges to the most comprehensive research institution in the State of New York, b) accessing a high-performance computer at the Center for Computational Research and c) having BIG provide financing for equipment for an industry partners' use. Current partners have engaged with BIG to develop machine-learning algorithms, run computationally intensive models and access UB's biobank and sophisticated equipment in the proteomics and genomics cores. BIG enables partners to reach their next growth milestone at an accelerated pace.

BIG connects companies to expertise, specialized equipment and state-of-the-art facilities to enable growth.

Genomics and Bioinformatics Core
Proteomics and Bioanalysis Core
Next Generation Sequencing
High-Performance Computing
High-Speed Networking
Analysis of Large Volume Data
Genomics Data Warehouse





What public-private partnership wins look like:

BIG provides customized solutions, access to expertise, research capabilities and supercomputing resources to advance new discoveries in biotech, pharma, and medicine to create rewarding, high-tech jobs in Western New York.

GARWOOD MEDICAL

Smart medical device manufacturer



Partnering with BIG provides the company with robust university engineering expertise to accelerate development and commercialization of its programmable, monitored medical devices. This partnership drives Garwood's and UB's technologies through development, by performing aspects of research, device modeling, rational product design and prototyping, verifications, validations and characterizations of the applications and imbedded technologies by leveraging high performance computing and bioinformatics.

CIRCUIT CLINICAL

Online clinical research site network



Partnering with BIG enables the company to expand its technology platform and enhance clinical trial opportunities throughout the Buffalo Niagara region. Circuit Clinical, a research site network dedicated to rapid, high-quality patient recruitment and enrollment, works to bring new patients and physicians into clinical trials. The process significantly improves outreach to doctors and their patients and simplifies enrollment and participation in trials.

Collaborating to expand entrepreneurial services across Western New York to help technology startups grow.

WIN (WNY Incubator Network) is a collaborative of business incubators that fosters startup growth through programs and services.

WIN, a NYS designated Hot Spot, supported by UB, provides connections and networking to spur startup growth. UB's partner incubators in WIN share resources and best practices to produce custom programs for incubator companies. WIN offerings include: in-person and online programming to help companies prepare to raise capital (Pitch Prep); subsidies for incubator ventures to retain outside experts to lead them past significant development milestones (Embedded Consultants); a network of vetted, trusted service providers offering discounted rates to incubator companies (Deals & Discounts); a set of state incentives for early stage companies (Innovation Hot Spot Tax Incentives); and connections with outside experts to submit timely, high-quality proposals to relevant federal agencies (SBIR/STTR Assistance). WIN is an active partner in attracting other entrepreneurship programs to WNY, such as Critical Path Life Sciences Accelerator, UB's I-Corps site program, and targeted programs for women and minority outreach.



WIN Incubator Partners

43 North (Buffalo)
The Thomas R. Beecher, Jr.
Innovation Center (Buffalo)
Fredonia Technology Incubator
(Dunkirk)
Harrison Place (Lockport)
Incubator Works (Alfred)
Olean Business Incubator (Olean)
UB BioSciences Incubator (Buffalo)
UB Technology Incubator (Amherst)
Z80 Labs (Buffalo)

WIN helps incubator companies grow, achieve greater profitability and become attractive to investors. Collectively, our incubators are home to more than 200 ventures, directly served by WIN programs.



What winning partnerships with industry looked like in fiscal year 2016-17:

A WIN FOR INDUSTRY

\$44.9M

Funding Raised
(from federal, state or non-governmental funds)

A WIN FOR NYS

Total Employment in NYS

148 jobs

Including

110 new jobs

Spending in NYS

\$6.7M

A WIN FOR UB

WNY Incubator Network provides a direct bridge between students and incubator ventures, facilitating job and internship opportunities.

Source: Data reflects findings from a survey of 33 company partners conducted in 2017 that collected economic impact data for the 2016-17 fiscal year relating to their interaction with UB Business and Entrepreneurship Partnerships' centers and programs.

Funding Raised reflects the total federal, state, or non-governmental funding raised by companies (not including revenue from the sale of goods or services). Jobs Supported reflects full-time equivalent employment at industry partners who are living in New York State. (1 full time job=1 FTE, 1 part time job =0.5 FTE) New Jobs reflect permanent, full-time positions created as a result of business expansion resulting from UB program efforts. Spending in NYS reflects estimated spending by industry partners on the purchase of goods and services in NYS excluding payroll.

Attracting businesses and jobs to New York State through START-UP NY.

START-UP NY is a tax incentive program connecting universities with companies that will create new jobs in New York.

START-UP NY provides tax incentives to eligible new and expanding businesses. UB, a program leader, offers qualified companies the opportunity to enjoy a range of valuable benefits. The university designates vacant space as Tax Free Areas on or near the school's three campuses. Approved companies enjoy up to 10 years of no NYS income tax for the company and its eligible employees, and sales tax relief on company purchases. These incentives enable companies to grow in the state and attract top talent. With the connection to UB, the companies provide internships for students, recruit graduates, collaborate with faculty on research and offer mentoring and guidance on curriculum. By aligning with UB's academic mission, creating new jobs, and making significant capital investments, UB-sponsored START-UP NY companies contribute to the revitalization of Western New York.



Eligibility Requirements

- Will create new jobs in the first year
- Will bring positive economic benefits to the community
- Will support the academic mission of the University at Buffalo



What winning partnerships with industry looked like in fiscal year 2016-17:

A WIN FOR INDUSTRY

\$65.4M

Funding Raised
(from federal, state or non-governmental funds)

A WIN FOR NYS

Total Employment in NYS

403 jobs

Including

229 new jobs

Spending in NYS

\$17.6M

A WIN FOR UB

START-UP NY
companies are
providing a great
pathway for
UB students to
internships and jobs,
helping retain more
of our talent in NYS.

Source: Data reflects findings from a survey of 47 company partners conducted in 2017 that collected economic impact data for the 2016-17 fiscal year relating to their interaction with UB Business and Entrepreneurship Partnerships' centers and programs.

Funding Raised reflects the total federal, state, or non-governmental funding raised by companies (not including revenue from the sale of goods or services). Jobs Supported reflects full-time equivalent employment at industry partners who are living in New York State. (1 full time job=1 FTE, 1 part time job =0.5 FTE) New Jobs reflect permanent, full-time positions created as a result of business expansion resulting from UB program efforts. Spending in NYS reflects estimated spending by industry partners on the purchase of goods and services in NYS excluding payroll.

What winning partnerships look like

Meet the company that **won** tapping into UB's entrepreneurship UB's supercomputer **catapulted** **next level**. Get to know the first company to use university technology as a **player on the global stage**. Discover a company that **made a winning** pointed in the right direction how UB students and faculty **the vaccine industry**. Learn how an approach helped **a young start-up**



University at Buffalo

Business and Entrepreneur
Partnerships

investors over after
eural smarts. Learn how
alted a local company to the
first life sciences or biotech
echnology to **become a**
Discover a UB spin out
ng idea a reality after being
n for funding and grants. See
y technology **revolutionized**
how UB's business-friendly
artup flourish and thrive.

Circuit Clinical

Meet the company that **won investors over** after tapping into UB's entrepreneurial smarts.

COMPANY NAME

Circuit Clinical

FOUNDED

2014

LOCATION

Buffalo, NY

INDUSTRY/BUSINESS

Research

ABOUT THE COMPANY

Circuit Clinical focuses on finding patients to participate in clinical research projects. The company has established a network of doctors, medical groups and accountable care organizations with access to about 1 million patients.

WNY EMPLOYEES

26 employees

WEBSITE

www.circuitclinical.com



How UB builds a winning partnership

Irfan Khan, MD, was considering locating his startup in Denver, Colorado when he learned about the initiatives New York State introduced to attract new companies. He reached out to the START-UP NY program – which exempts employees from paying state income tax for 10 years – and “they were incredibly supportive and efficient,” Khan said. “It gives us the ability to recruit the best and brightest.”

The company then linked up with UB's Buffalo Institute for Genomics and Data Analytics (BIG), a relationship that further connected the promising Circuit Clinical to Western New York. “We were then awarded a \$1.1 million grant to get us through our early stage growth, and it has all led to a much deeper relationship with UB,” Khan said.

How industry wins

Circuit Clinical was an active participant in Buffalo's entrepreneurial ecosystem and was encouraged by UB to participate in the National Council of Entrepreneurial Tech Transfer (NCET2) and then the 43North competition where Circuit finished as a semifinalist. “Both experiences raised our profile so much with investors outside New York State that we closed a round of investment and brought money in from the outside,” Khan said.

How the region wins

“We would like to think that we have played a role in having brought the value of Western New York to the attention of large pharmaceutical companies and billion dollar contract research organizations. We're unapologetic about it,” Khan said. “It's a bit of a challenge early on teaching large companies that Western New York is a vibrant, active life sciences community. Buffalo has deep strategic partnerships and a deep vision to be excellent. I absolutely see UB as an out-front leader. UB's leadership is so pro-growth and pro-partnership; it is certainly at the vanguard of what is happening with the economic vitality of Western New York.”



Data Analytics Leveraging the Center for Computational Research



Partnership with Buffalo Institute for Genomics and Data Analytics (BIG)



START-UP NY Company



Office on UB's Downtown Campus



UB Center for Advanced Technology Award Recipient



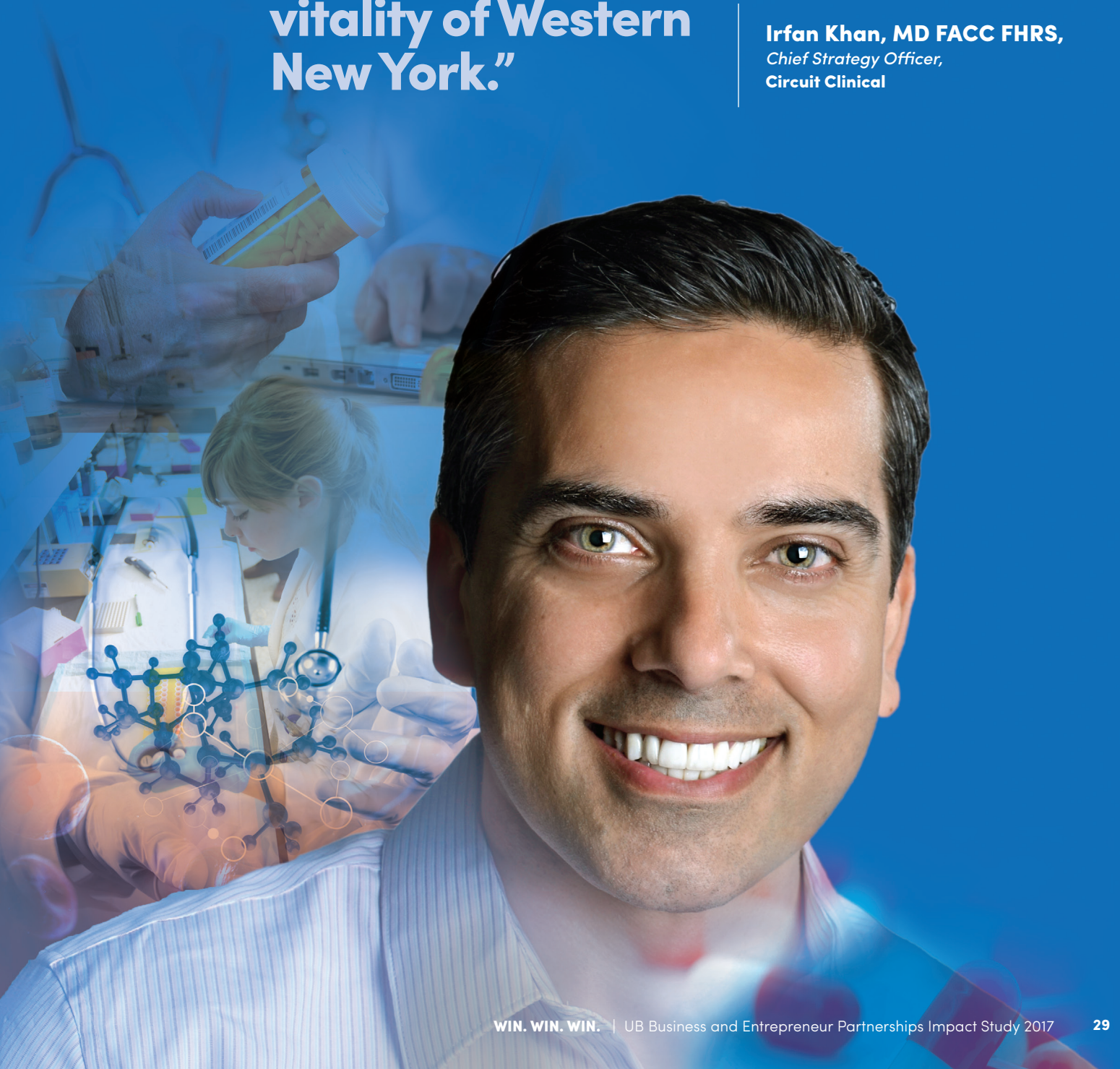
Life Sciences Career Experience Program Interns

Everyday victories add up to a winning partnership.



UB's leadership is so **pro-growth**
and pro-partnership; it's certainly
at the vanguard of what's
happening with the economic
vitality of Western
New York."

Irfan Khan, MD FACC FHRS,
Chief Strategy Officer,
Circuit Clinical



Sentient Science

Found strength in UB's computational expertise and custom solutions

COMPANY NAME

Sentient Science

FOUNDED

2011

LOCATION

Buffalo, NY

INDUSTRY/BUSINESS

Utilities

ABOUT THE COMPANY

Sentient Science, a trusted third party to operators, provides materials science based computational testing on major rotating systems and key components in the wind energy, aerospace and transportation markets.

WNY EMPLOYEES

50 employees

WEBSITE

www.sentientscience.com



How UB builds a winning partnership

The company created a multi-physics computer program to predict when rotating machines will fail. That mission connects with two of UB's areas of expertise: computer programming and materials science. The viability of Sentient's product, called DigitalClone, has been proven accurate by NASA and manufacturers such as Boeing, GE and Honeywell. The predictive system has been installed on 20,000 wind turbines, and the company expects to reach 100,000 turbines in the future.

By using it, companies can greatly extend turbine lifespan from about eight years to 30 years, said company President and CEO Ward Thomas. Sentient Science was wooed by numerous universities but selected UB in 2011. The company uses the supercomputer located in downtown Buffalo within the Center for Bioinformatics and Life Sciences (CBLS). "We would not be able to commercialize our technology, especially at the rate and effectiveness we have, without the University at Buffalo's Center for Computational Research," Thomas said.

How industry wins

The company's need for significant advanced computer power to run its predictive programs made UB's Center for Computational Research (CCR) a vital partner. The CCR provides access to its 3,400 processor-computing infrastructure to run hundreds of simulations, putting the company at the forefront of the industry.

How the region wins

The presence of Sentient Science has drawn attention to the region's sophisticated capabilities. "Our global customers fly here from China and Spain, so they get to see Buffalo," Thomas said. "And as we hire people, they buy houses and cars and pay utilities, so we have a direct local impact, as well."



Center for Computational Research for Supercomputing Capabilities



Small Business Innovation Research (SBIR) Program with CMI Faculty Members



UB's Department for Materials Design and Innovation (MDI)



Serves on CMI's Industrial Advisory Board



UB Center for Advanced Technology Award Recipient



Advanced Manufacturing Career Experience Program Interns

Everyday victories add up to a winning partnership.



Our global customers fly here from China and Spain, so they get to see Buffalo. And as we hire people, they buy houses and cars and pay utilities, so **we have a direct local impact, as well.**

Ward Thomas,
President and CEO,
Sentient Science



Athenex

Entrepreneurial spirit and UB support drives global growth

COMPANY NAME

Athenex

FOUNDED

2003

LOCATION

Buffalo, NY

INDUSTRY/BUSINESS

Pharmaceuticals

ABOUT THE COMPANY

Athenex is a global biopharmaceutical company dedicated to the discovery, development and commercialization of novel therapies for the treatment of cancer. Its mission is to improve the lives of cancer patients by creating more effective, safer and tolerable treatments.

WNY EMPLOYEES

132 employees

WEBSITE

www.athenex.com



How UB builds a winning partnership

One of the first life sciences companies spun out of the university, Athenex helped spark an entrepreneurial movement that has grown into robust support programming such as pre-seed workshops, training, academic advisory opportunities and funding mechanisms to help startups move forward. Company founder David G. Hangauer, PhD, said that when Athenex (previously known as Kinex) started, the ecosystem was very new, "At that time, Kinex had access to UB's CBLS state-of-the-art chemistry labs—the only labs available capable of combinatorial chemistry. We also used the CBLS biology lab space and the clean room facility to develop processes for manufacturing clinical drug products." Besides UB's facilities, Athenex benefitted from multiple CAT projects and financial support that made its investors' money go further.

How industry wins

Hangauer, who came to UB after a decade in the private sector, said the university was supportive of his pioneering efforts to discover new kinase inhibitors. UB continued to provide programs to set research and licensing terms at the project planning stage. "This kind of collaboration made it possible to get other investors interested and motivated," said Hangauer.

How the region wins

"Athenex is proof that you can start a life sciences company in Buffalo and take it all the way to an IPO. Having office and lab space in the Center for Bioinformatics and Life Sciences (CBLS) building allowed us to hire scientists quickly. We were a virtual company up to that point. Today, we are a rock on the medical campus and we are building a brand new manufacturing facility in Dunkirk, NY."



Startup began at UB Lab



UB Licensed Technology to Kinex



Started Company at Center for Bioinformatics and Life Sciences Facility (CBLS)



UB Center for Advanced Technology Award Recipient



IPO June 2017

Everyday victories add up to a winning partnership.



This kind of **collaboration**
made it possible to get other
investors interested
and motivated.”

David G. Hangauer, PhD,
Founder,
Athenex



Cytocybernetics

Building the life sciences economy one job at a time

COMPANY NAME

Cytocybernetics

FOUNDED

2013

LOCATION

Buffalo, NY

INDUSTRY/BUSINESS

Biotechnology

ABOUT THE COMPANY

Cytocybernetics specializes in cellular electrophysiology. The Cybercyte is a powerful, but user friendly, plug and play dynamic clamp system. Cytocybernetics offers a complete range of CRO services, including FDA mandated drug safety screening, custom electrophysiology, custom modeling, and custom analysis.

WNY EMPLOYEES

7 employees

WEBSITE

www.cytocybernetics.com

Cyto
Cybernetics

How UB builds a winning partnership

Two UB professors, Glenna Bett, PhD, and Randall Rasmusson, PhD, launched Cytocybernetics and designed a machine called the CytoCyte that delivers a missing electrical charge to newly created heart cells, making it possible to test the impact of new drugs on the heart. The process can save hundreds of millions of dollars in the drug discovery process. "We found there was a piece of machinery that didn't exist, so we made it," Bett said. After describing the device at an annual meeting of the Biophysical Society, people asked where they could get one, "So we came back to UB and started a company," she said. The university assisted with applying for a patent, getting grants and even providing entrepreneurial training, all of which made the company possible. "We've really benefited and it has been one super supportive journey with UB," Bett said.

How industry wins

"Without having the support, it wouldn't have been possible," Bett said. UB has helped in securing UB CAT grants, encouraging the new company to apply to the 43North business plan competition and getting the company into the START-UP NY program, which helps Cytocybernetics recruit because employees pay no state income tax for 10 years. Between grants and contest winnings, the company has raised nearly \$2 million.

How the region wins

The company is helping build the region's life sciences economy and creating high paying, technical jobs. "I am very proud to say our first employee was a Buffalo native who had gone to Silicon Valley, and he was looking to come back to the region," Bett said. "We've always felt good about that."



UB Spinout



UB Licensed Technology



SUNY & UB Technology Commercialization Fund Awards



UB Center for Advanced Technology Award Recipient



UB Pre-seed Workshop



WIN (WNY Incubator Network) Program Participant



START-UP NY Company



Bright Buffalo Niagara Participant

Everyday victories add up to a winning partnership.



I am very proud to say **our first employee was a Buffalo native** who had gone to Silicon Valley and he was looking to come back to the region.”

Glenna Bett, PhD,
Founder and CEO,
Cytocybernetics



Abcombi Biosciences

Leading the charge in the vaccine industry

COMPANY NAME

Abcombi Biosciences, Inc.

FOUNDED

2015

LOCATION

Buffalo, NY

INDUSTRY/BUSINESS

Biotechnology

ABOUT THE COMPANY

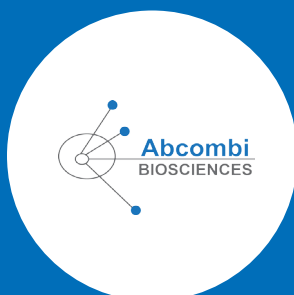
Abcombi Biosciences is a pre-clinical vaccine and therapeutic development company dedicated to delivering "smarter" vaccine and anti-infective solutions.

WNY EMPLOYEES

3 employees

WEBSITE

www.abcombibio.com



How UB builds a winning partnership

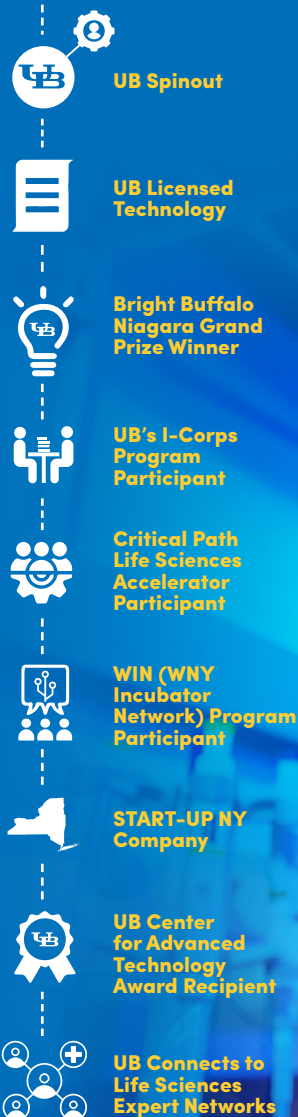
Abcombi Biosciences is on the verge of a vaccine revolution. The company, launched out of a UB lab, takes a novel approach to attacking diseases caused by bacteria. Traditional vaccines attack bacteria when it tries to colonize in the human body, and if the bacteria survives, there is nothing left to combat it. Abcombi's vaccine attacks the bacteria only when it has been disturbed and transformed into its virulent state. Founder, Charles Jones said, "There are close to 100 variants of the pneumococcal bacteria. The current vaccine tackles only 13 variants. We can cover all of them." Embraced by UB he said, "The reality is that UB, and Buffalo in general, is a highly supportive entrepreneurial ecosystem." Disappointed with other universities and the cursory and cold financial review he received, Jones states, "We found that other universities are not grounded in reality with their valuations. It's about the money. Although there is a financial motive at UB, there seems to be a genuine desire for the companies to succeed."

How industry wins

"It's hard for me to envision a future, or where we are today, without UB's assistance," Jones said. Abcombi utilized many programs available through UB, including funding from the Bright Buffalo Niagara business competition, Critical Path and National Science Foundation (NSF) programs. "All the key events for the company were all initially orchestrated by the university," Jones said. Abcombi, still active with UB's research labs, is developing an alternative to Tamaflu.

How the region wins

Jones pays it forward. He searches out venture capitalists to come to Buffalo. "I am actively recruiting," Jones said. He explains to them how working in Buffalo brings "the most bang for the buck," including lower rents and salaries. "They hear that and they perk up," he said. "We want to stay in Buffalo. It's the most efficient deployment of the capital that we have."



Everyday victories add up to a winning partnership.



The reality is that UB,
and Buffalo in general,
is a **highly supportive
entrepreneurial
ecosystem.**"

Charles Jones, PhD,
Chief Executive Officer,
Abcombi Biosciences



Heads Up Display

Flaunts its Buffalo roots

COMPANY NAME

Heads Up Display, Inc.

FOUNDED

2013

LOCATION

Buffalo, NY

INDUSTRY/BUSINESS

Safety Solutions, Electronics, and Software Development

ABOUT THE COMPANY

Heads Up Display's safe technology roadmap solves challenges of safely leveraging mobile technology, as well as hazardous exposure noise, temperature, humidity, dust/silica, man down and lone worker. Platform architecture is suited for rapid deployment and adoption onto any industrial site.

WNY EMPLOYEES

1 employee

WEBSITE

www.headsupsafe.com



How UB builds a winning partnership

Brendon Dever's technology idea hatched at Buffalo's Startup Weekend. The company now sells a tiny device that attaches to work glasses to monitor environmental threats, like noise, and alerts wearers when things approach dangerous levels. "This company would not exist without the help we received from UB," said Dever, president of the company.

Dever states, "UB was the first line of support for our young, emerging company. People were willing to listen and took us to the next level." The help appeared in various forms, from mentorship, business training, grant opportunities and a welcoming mentality. "It's a safe place to share your ideas," Dever said. Heads Up participates in the START-UP NY program and works out of The Innovation Center on the Buffalo Niagara Medical Campus. "We've received over \$80,000 in grants from UB, including three CAT grants. Our first grant, available through UB, allowed us to build a prototype to take to market," he said.

How industry wins

Dever considers UB's entrepreneurial ecosystem, "fundamental to the success of the development of the product. No way could we have made it this far without that early support." Dever also participated in classes from UB's Center for Entrepreneurial Leadership, which provided mentoring to help steer the young company forward.

How the region wins

When Dever presents the company to potential customers, partners and investors, he knows he is an ambassador for the region. Dever states, "We don't hide the fact we're from Buffalo. In a lot of ways it helps us, people can see how capital efficient we've been." "There's definitely a buzz that Buffalo has advantages, especially talent in computer science and engineering," he said. The company has deployed technology with 30 companies in five industries in seven countries. "We've made a name for ourselves. We're seen as thought-leaders in the industry of wearable mobile technology with advanced analytics," he said.



WIN (WNY Incubator Network) Program Participant



UB Center for Advanced Technology Award Recipient



START-UP NY Company



High Tech Center for Entrepreneurial Leadership (CEL) Participant



Bright Buffalo Niagara Participant



Advanced Manufacturing Career Experience Program Interns



UB's Toxicology Research Center & Atlantic OSHA Training Center

Everyday victories add up to a winning partnership.



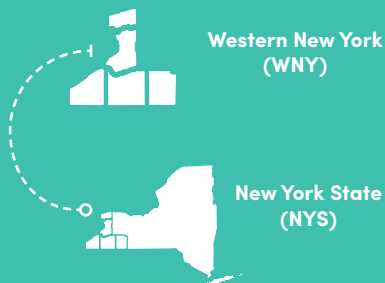
UB was the **first line of support** for our young, emerging company.”

Brendon Dever,
President,
Heads Up Display Inc.



What goes in to measuring the impacts

Economic impacts are reported for two geographies within this report.



Western New York is comprised of Niagara, Erie, Chautauqua, Cattaraugus and Allegany Counties.

The region is located at the western edge of New York State and includes the major cities of Buffalo and Niagara Falls.

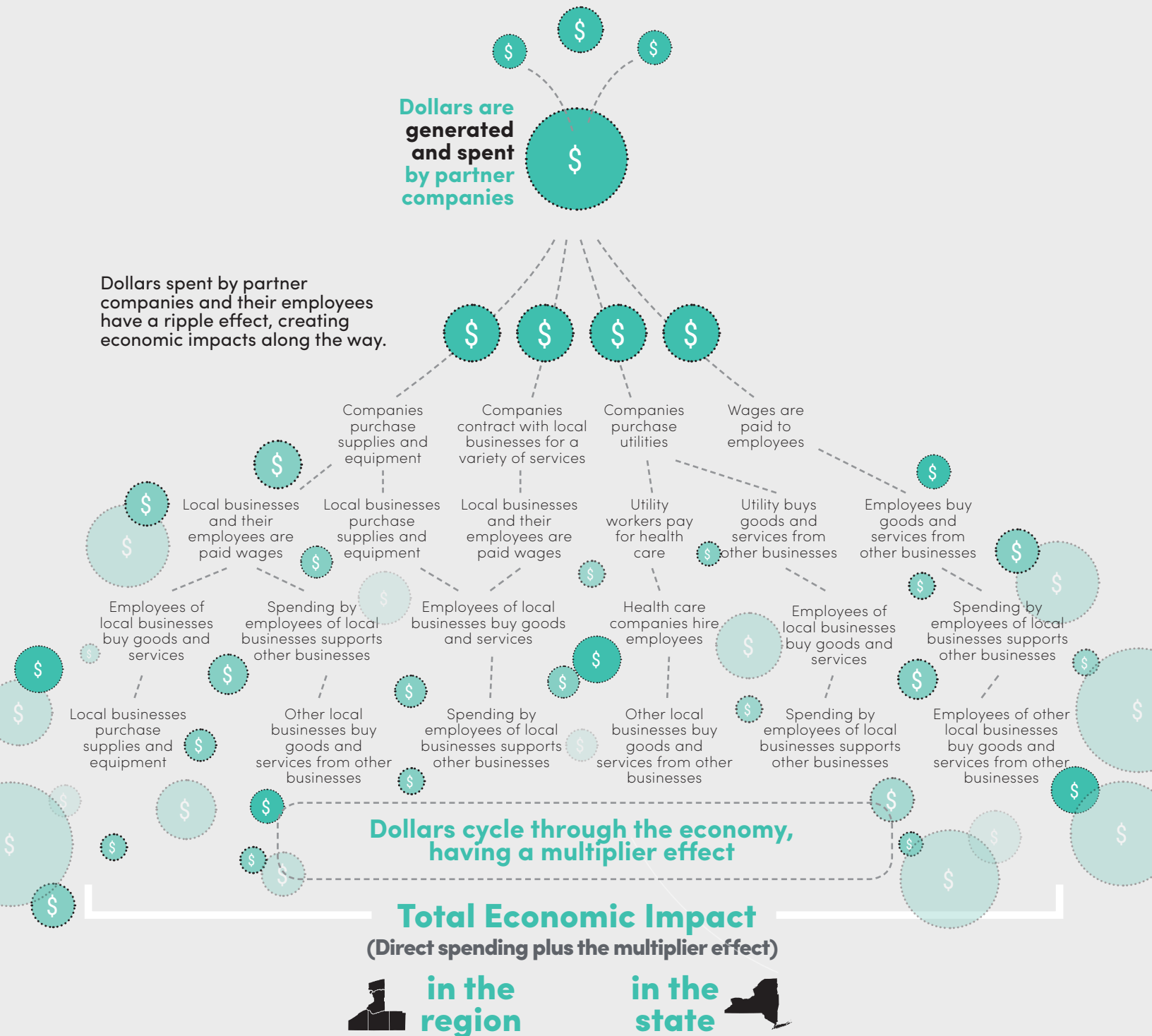
UB Business and Entrepreneur Partnerships' impacts are broad and far-reaching. By working with hundreds of companies, *UB Business and Entrepreneur Partnerships* supports economic activity and employment across Western New York, New York State and the globe. New York State funded centers, programs and services support the development and growth of innovative companies and entrepreneurial ventures.

The success of these centers, programs and services is measured by the impact they have on individual companies and the economy as a whole. This report provides measures of success—both by the numbers and beyond the numbers—that describe the collective impacts *UB Business and Entrepreneur Partnerships* and its partner companies had in the fiscal year 2016-17 (July 1, 2016 – June 30, 2017).

The impacts measured in this assessment focus on the ecosystem of companies that work with *UB Business and Entrepreneur Partnerships*. Economic impact is measured by the total economic output and employment resulting from spending on materials and services for production, business development services, capital investments, and employee compensation. All economic impact measures focus on economic activity in Western New York and New York State as a whole. Data pertaining to partner companies were gathered from several sources including D&B Hoovers, Infogroup Inc.'s Reference USA database, and an annual survey of companies performed by *UB Business and Entrepreneur Partnerships*.

Additionally, six case studies explore impacts beyond the numbers for individual companies that worked with *UB Business and Entrepreneur Partnerships* in recent years. Case studies describe the motivation for working with UB and how these collaborations affected the development of innovative technologies.

How economic impacts happen



WIN.

It's a win for New York State.

UB's industry partners...

...supported **1,936 jobs** in NYS, by directly employing 1,302 people, and supporting 634 additional jobs through new economic activity.



...had a collective **economic impact in NYS of \$257.4 M** resulting from the direct spending of \$137.4 M and the generation of new economic activity that added \$120.0 M to the state's economy.



It's a win for Western New York.

UB's industry partners...

...had a collective impact of **\$228.3 M in WNY** and supported **1,883 jobs**. Jobs at partner companies paid an **average annual salary of \$63,254**. That's over \$18,000 more than the average salary across all industries in WNY.



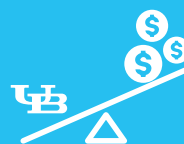
Economic impact in NYS was calculated by the UB Regional Institute using IMPLAN, an input-output model that incorporates state and regionally-specific trade flows for more than 500 industry sectors. Total economic impact reflects total output, with additional economic activity representing the difference between total output and direct spending. Direct employment reflects full-time equivalent jobs. (1 full time job=1 FTE, 1 part time job =0.5 FTE)

Average annual salary for industry partners is based on the average wages of workers in industries (defined by NAICS 3-digit classifications) that partner companies represent. The calculated annual salary is weighted by the number of workers that companies employ in each industry. It is also weighted for the percentage of workers living in WNY using the average wage for industry partners in WNY and the percentage of workers living in NYS, outside of WNY using the statewide average wage for industry partners. Average wages for WNY and NYS are calculated using the 2016 Quarterly Census of Employment and Wages (QCEW) from the NYS Department of Labor.

WIN.

It's a win for industry.

UB helped industry partners...



...raise **\$120.8 M** in federal, state and non-governmental dollars.



...boost company revenues by **\$5.4M**.



...realize **\$2.3M** in cost savings.

Source: Data reflects findings from a survey of company partners conducted in 2017 that collected economic impact data for the 2016-17 fiscal year relating to their interaction with UB Business and Entrepreneurship Partnerships' centers and programs. 93 companies responded to this portion of the survey. Boost in company revenues reflects increases in company revenues attributable to support provided by UB Business and Entrepreneurship Partnerships resulting from product sales, contacts or other sources. Cost savings reflects savings attributable to support provided by UB Business and Entrepreneurship Partnerships resulting from production process improvements, value of accessing specialized equipment at UB, value of UB expertise or analytical testing, or other sources. Total amount raised reflects federal, state, or non-governmental funding acquired.

WIN.



University at Buffalo

Business and Entrepreneur
Partnerships

It's a win for UB.

UB Business and Entrepreneur Partnerships connected...



...**92** interns with opportunities to gain first-hand work experience at our partner companies.



...**144** UB grads with employment at partner companies.

Additional wins...



Industry shared valuable insights by giving lectures, hosting workshops and conferences.

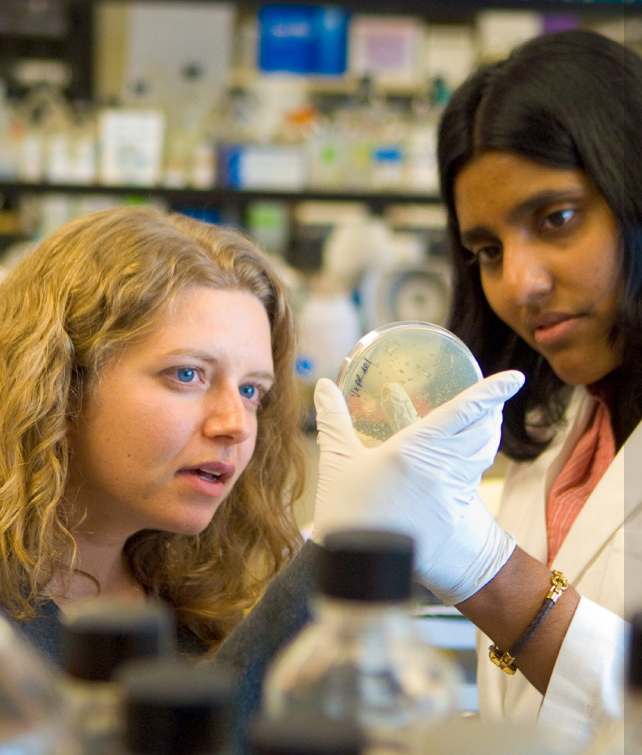
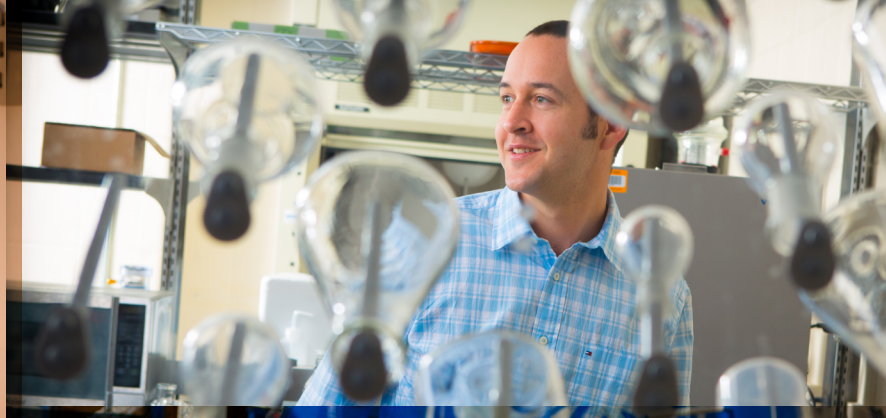


Industry had advisory roles at UB that helped align academics with company needs.



Industry guided students' personal development through mentoring.

Data reflects findings from a survey of company partners conducted in 2017 that collected economic impact data for the 2016-17 fiscal year relating to their interaction with UB Business and Entrepreneurship Partnerships' centers and programs. Intern number reflect industry partner hiring of UB student interns during 2016-17. Employment number reflects industry partner employment of UB graduates for full-time or part-time positions during 2016-17.



Innovation happens Here

Whether you're just starting out or have an established business, we can help you grow. Connect with our vast network of resources to move your efforts forward. Collaborate on R&D projects, access state-of-the-art equipment, leverage student talent or partner with world-class researchers to support the commercialization of your ideas and drive innovation to market. Everyday victories happen here!

 **University at Buffalo**
Business and Entrepreneur
Partnerships



Commercialize.

Grow.

Appendix Summary of Economic Impacts of UB Industry Partners, FY 2016–17

Funding

Outside funding brings new dollars to the Western New York Region and New York State which leverages additional spending and economic activity. In total, partner companies attracted over \$119 million in funding (in addition to sales revenues).

Funding Source	Amount	%
Federal	\$7,060,029	6%
State	\$1,893,292	2%
Non Govt	\$111,868,519	93%
Total	\$120,821,840	100%

Source: Figures include funds from sources other than sales or gains from investments and are derived from data provided by 53 companies in responses to *UB Business and Entrepreneur Partnerships'* annual economic impact survey. Percentages add up to slightly more than 100% due to rounding.

Spending

Spending benefits the economy, both directly and indirectly, as dollars recirculate and support additional spending by businesses and their employees.

Spending by partner companies totaled \$192 million. This spending includes \$135.5 million on payroll and \$56.6 million on all other expenses related to the production of goods or delivery of services.

Spending	WNY	NYS, outside WNY	Outside NYS	Total
Payroll (including benefits)	\$90,913,783	\$9,525,865	\$35,106,474	\$135,546,122
Goods and Services	\$31,048,345	\$9,140,053	\$16,428,917	\$56,617,315
Total Spending	\$121,962,128	\$18,665,918	\$51,535,391	\$192,163,437

Source: Figures include spending on payroll (wages and benefits) and the purchase of goods and services by partner companies. Spending amounts are derived from data provided by 81 companies in responses to *UB Business and Entrepreneur Partnerships'* annual economic impact survey.

Impacts on NYS Economy

UB industry partners generated a total economic impact of \$257.4 million on NYS's economy in 2016-17, supporting 1,936 direct and secondary jobs across the state. Direct purchases and payroll spending of UB industry partners totaled \$137.4 million and directly supported 1,302 jobs.

Type of Impact	Spending	Employment	Output
Direct impact of UB Industry Partners	\$137,396,210	1,302	\$137,396,210
Indirect impacts	N/A	235	\$55,917,430
Induced impacts	N/A	399	\$64,085,049
Total Impact	N/A	1,936	\$257,398,689

Source: University at Buffalo Regional Institute analysis of UB partner spending data using IMPLAN with NYS-specific trade flow data. Direct impacts reflect employment and spending by UB industry partners, as reported on a survey of industry partners conducted during 2017. Indirect impacts reflect secondary industry sales within NYS's economy, while induced impacts reflect the re-spending of wages within the state. Total economic impacts reflect direct impacts plus secondary (indirect and induced) impacts in NYS.

Impacts on WNY Economy

UB industry partners generated a total economic impact of \$228.3 million on the regional economy in 2016-17, supporting 1,883 direct and secondary jobs across the region's five counties. Direct purchases and payroll spending of UB industry partners totaled \$122 million and directly supported 1,266 jobs in WNY.

Type of Impact	Spending	Employment	Output
Direct impact of UB Industry Partners	\$121,962,128	1,266	\$121,962,128
Indirect impacts	N/A	228	\$43,926,806
Induced impacts	N/A	388	\$62,438,923
Total Impact	N/A	1,883	\$228,327,857

Source: University at Buffalo Regional Institute analysis of UB partner spending data using IMPLAN with regionally-specific trade flow data for the five counties of Western New York. Direct impacts reflect employment and spending by UB industry partners, as reported on a survey of industry partners conducted during 2017. Indirect impacts reflect secondary industry sales within WNY's economy, while induced impacts reflect the re-spending of wages within the region. Total economic impacts reflect direct impacts plus secondary (indirect and induced) impacts in WNY.

Connect. Commercialize. Grow.



University at Buffalo

Business and Entrepreneur
Partnerships

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Buffalo, NY 14203

buffalo.edu/partnerships
UBpartners@buffalo.edu



Division of
Science, Technology
& Innovation

A Division of Empire State Development

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