

The University of Iowa

FY22 Annual Economic Development Report

Ranked amongst the best global universities, the University of Iowa stresses bringing “learning and discovery into the service of the people of the state of Iowa, the nation and the world” as a central mission. Translation of research and knowledge generated by University faculty, staff and students is a central means through which this mission is accomplished. Those actions subsequently translate into positive impact on the economy of Iowa. The University’s new strategic plan calls to “Accelerate entrepreneurship and support broader economic development through innovative engagement and partnerships with industry and community organizations.” This strategy is implemented by:

- Creating increased opportunities for entrepreneurial education, new venture creation, technology transfer, with a specific focus in medtech and edtech innovation, and
- Connecting faculty, staff, and students to organizations and subject matter experts to solve unmet needs in social, health, technical, and business problems

A robust strategy incenting economic development, on a campus like the University of Iowa, is key to transforming ideas into impact benefiting Iowans and beyond.

Subsequently, this report provides a description of the UI’s key initiatives in the economic development space— the work of the Chief Innovation Officer, who oversees Protostudios, UI Research Park, Translational Research Incubator, UI Ventures, and MADE; UI Research Foundation; John Pappajohn Entrepreneurial Center (JPEC); UI Pharmaceuticals, and other activities.

I. Organizing to Support Economic Development

The Chief Innovation Officer, who reports to the Vice President for External Relations with a dotted-line report to the President, oversees and coordinates the economic development activities for faculty, staff and graduate students at the University of Iowa. The Chief Innovation Officer oversees: Protostudios, UI Research Park, Translational Research Incubator, UI Ventures, and MADE.

In FY22, several broad themes served as the central organizing principles of the Innovation Office, including:

Focus on MedTech and EdTech. External reviews commissioned by the State of Iowa identified highly concentrated capabilities in the medical technology and education technology sectors. UI efforts are focused on exposing faculty, staff and students to the system of support which exists

at the university and in the surrounding community to assist them in transitioning their research or other ideas towards commercialization.

Mobilizing an External Network. The Innovation Office is exposing UI start-ups and entrepreneurially minded faculty, staff and students to skills and connections drawn from a network of contacts in the healthcare innovation and venture capital space. The network of individuals able to assess start-ups, offer strategic and experiential assistance, and connect them to talent not resident to Iowa.

Creating a Concierge Service to Support UI Faculty Innovations. Under the direction of UI Ventures, the Innovation Team established a comprehensive suite of services to assist UI faculty looking to engage the commercialization process. This service has and will continue to connect entrepreneurial faculty and companies with strategic support from medtech venture capital and industry knowledge, FDA guidance, intellectual property or clinical study guidance and reimbursement strategies.

Extending Advanced Prototyping Services to Medical Innovators. Protostudios, the UI's advanced 3D printing, prototyping and design service, maintains three locations on the UI campus to better serve its growing clients list of UI faculty and innovators from around the state. Approximately 70% of the work of Protostudios in FY22 supported healthcare innovation and more than 80% of their design service clients engaged with them through the newly opened office in UIHC.

Expansion of Innovation Funding Programs. Building on the successful Innovation fund programs in partnership with the Colleges of Medicine, Engineering and Department of Nursing to promote faculty innovation in medical device and software and College of Education to support Edtech, UI Ventures expanded Innovation Funding to College of Dentistry and College of Pharmacy in FY22. Encouraging proof of concept and translational projects is a key building block in the Economic Development pipeline. In addition to meeting practical and clinical needs, the projects provide a resource for innovative faculty to promote a more inventive culture. In FY22, 11 awards were made across 5 colleges for a total of \$480,000 granted. The majority of the awards supported medical device (55%), followed by software (27%), and training tools (18%).

III. University of Iowa Economic Development Infrastructure



University of Iowa
Research Foundation

In Yorkshire, England, a newspaper published a story about an 81-year-old great grandfather whose ankle caused him so much pain he could barely walk. After he underwent surgery and received an artificial ankle that reproduces a natural ankle's full range of motion, he was able to fulfill a lifelong dream of flying a Spitfire plane. Although he may not know it, his new lease on life is courtesy of innovative researchers at the University of Iowa who designed the artificial ankle and brought their invention to the UI Research Foundation for patenting and licensing into the commercial market.

This is just one example of how UIRF helps our university researchers amplify the impact of their work to directly benefit people's lives. UIRF's efforts reflect the broad scope of research across our campus: certainly in the medical space like with the artificial ankle and with the first-ever FDA-approved AI diagnostic for diabetic retinopathy, but also in engineering, for example with efficient, high-powered infrared LEDs designed for industrial applications, and in education with curricular content for mobile study guides that help students with professional certification and licensure exams. UIRF also helps our researchers share their critical tools with other researchers worldwide, as seen with the distribution of Iowa's COVID mouse model to hundreds of institutions across the globe.

Revenue from the licensing agreements UIRF negotiates with our company partners is shared with our inventors personally and also supports department, collegiate, and cross-campus research efforts. Many licensing relationships also lead to sponsored research at the university. And in fact, the connection between research grants and inventions goes both ways—federal agencies, non-profit-foundations, and corporations usually include intellectual property provisions in their grants, and UIRF takes the lead in helping our researchers satisfy these requirements.

In the past five years, UIRF has worked with over 800 researchers from thirteen colleges on over 500 invention disclosures.

protostudios

Protostudios (<https://protostudios.uiowa.edu/>) is a state-of-the-art, rapid-prototyping facility located in the MERGE co-working space in downtown Iowa City, Van Allen Hall and at UIHC. It works with UI researchers, researchers from other Iowa universities and healthcare institutions and community members to develop fully functional prototypes of product ideas, allowing innovators to test, redesign, and determine manufacturing paths and demonstrate usability to investors. Protostudios primary focus is on biomedical and electronics prototyping with access to 3D printers (plastics, metals, ceramics) milling, laser/wet jet cutter, printed circuit board fabrication, and consulting from on-staff industrial designers and engineers. Anatomical modeling of human organs prior to complex surgeries is developing into a key value add of Protostudios.

The creation of Protostudios was funded through a \$1.5 million Strategic Infrastructure Fund grant from the Iowa Economic Development Authority, and the authority approved a \$500,000 grant to outfit additional space for new equipment that expands the organization's capabilities.

UI Research Park

EXPANDING TECHNOLOGIES AND COMPANIES

The UI Research Park (<https://researchpark.uiowa.edu/>) leases building sites and space to growing technology companies that require sustained research relationships with the university. The Park is home to a business incubator program that has nurtured over 100 UI start-ups and other new ventures since its founding. Incubator tenant companies can draw on both the research and business resources of the university, including access to UI libraries, hazardous waste management services, support for SBIR/STTR grants (Small Business Innovation Research/Small Business Technology Transfer federal grants), educational seminars, networking opportunities, and shipping/package handling.

The BioVentures Center (BVC) in the park contains wet laboratory modules that can be shared for life science companies and office/dry laboratory modules for engineering and technology-based companies. The BioVentures Center wet lab space is currently full and has a waiting list.

The Park is also home to three of the university's specialized core facilities. These facilities provide technical support services critical to the growth of start-up companies as well as existing industry partners:

- Center for Biocatalysis and Bioprocessing operates a microbial fermentation facility and specializes in both upstream and downstream bioprocessing with expertise in process scale up for food products, biofuels, biopharmaceuticals, and other biotechnology products.
- National Advanced Driving Simulator conducts research and development on driving safety for the government, military, and industry partners.

- State Hygienic Laboratory is the state’s environmental and public health laboratory, serving all ninety-nine Iowa counties as well as out-of-state clients by testing and tracking infectious diseases and illnesses.



The Translational Research Incubator (TRI) (<https://uiventures.uiowa.edu/translational-research-incubator>) serves as the wet-lab counterpart to Protostudio’s dry-lab program. The TRI space, located in the Medical Laboratories building, can house up to four early-stage research-based biomedical or life science companies focused on commercializing technology developed at the University of Iowa.

Much of the support for TRI goes to purchasing equipment that can be shared among the company tenants. This allows companies to focus their limited resources on technology-specific development to maximize their funding -and do so in close proximity to their day jobs. The space is ideal for small start-ups that need to conduct early-stage proof-of-concept experiments, often with SBIR/STTR funding, to attract the investment needed to expand operations at the UI Research Park and other locations in the eastern Iowa region. The TRI space is currently full with a waiting list for occupancy.



UI Ventures (<https://uiventures.uiowa.edu/>) assists university faculty and staff in creating new companies based upon their research. It facilitates connections between the faculty and outside mentors, services and investors and serves as a liaison between the company and university services. Working closely to support the University of Iowa Research Foundation, UI Ventures actively engages with outside investors and business experts to improve visibility of UI companies and bring business expertise to campus. In addition, UI Ventures manages the TRI incubator and operates the MADE program to encourage faculty and staff innovation and entrepreneurship throughout campus.



Iowa MADE (<https://iowamade.org/>) is a first of its kind program, in the nation, whose mission is to encourage and facilitate the UI community to bring innovative, need-based products to market with the goal of enhancing economic development at the university as an extension of research and scholarship.

MADE is a manufacturing and e-commerce initiative launched in FY18 with 3 objectives: 1) bring simple, low volume technology to market utilizing local Iowa manufacturing whenever possible; 2) contribute to a cultural transformation around innovation on campus; and 3) provide students with an opportunity to learn first-hand the tools necessary to bring a product to market. The program crosses several departments with products from Ophthalmology, Anesthesiology, Dentistry, Cardiothoracic Surgery, and General Surgery. Products are available for sale through the iowamade.org website and revenue is used to reimburse development costs to encourage continued support of innovation and development. All technologies remain available for licensing to an external company through UIRF.

An undergraduate student operations team maintains the FDA compliant quality system, manufacturing, product management, marketing, and sales. These students have the unique opportunity to gain in depth real-world experience and leadership skills on campus to complement their classroom education.



The John Pappajohn Entrepreneurial Center (Iowa JPEC) (<https://www.iowajpec.org/>) offers nationally recognized comprehensive entrepreneurial education programs that are available to all Iowans. At the undergraduate level, Iowa JPEC and the Department of Management and Entrepreneurship offer a BBA in Management with an Entrepreneurial Management Track to Tippie College of Business students. Iowa JPEC and the College of Liberal Arts and Sciences offer a BA in Enterprise Leadership (on-campus and online). In addition, Iowa JPEC offers the Technological Entrepreneurship Certificate for engineering students, and the Certificate in Entrepreneurial Management for all undergraduate students. The Tippie College of Business offers a Graduate Innovation Certificate. Advanced entrepreneurship courses are also offered to MBA students at several locations across the state of Iowa as well as virtually.

Iowa JPEC and its university partners also play an important role in the development of Iowa-based technology and high-growth start-up companies. Whether providing one-on-one consulting services and group training, working with start-up companies on technology transition, directing UI students on advanced field study projects, or providing training and seminars to business executives, Iowa JPEC seeks to support the next generation of entrepreneurs and business leaders.



The University of Iowa Center for Advancement's (UICA) (<https://www.foriowa.org/>) Corporate and Foundation Relations group promotes economic development through connecting corporate partners with the UI's strengths. In addition to connecting established companies with the university, the Center for Advancement is a key player in tapping UI's extensive alumni base to support entrepreneurship and technology commercialization through monetary resources and, equally important, advice and expertise.



UI Pharmaceuticals

UI Pharmaceuticals (<https://uip.pharmacy.uiowa.edu/>) is a fee for service entity on the University of Iowa Campus that provides contract drug manufacturing (CDMO) services to academic, biotech, and pharmaceuticals clients. These services range from early-stage formulation development, analytical method support, clinical trial material manufacturing, to commercial product manufacture and support. It is organizationally structured as a division of the UI College of Pharmacy and employs approximately 85 pharmaceutical professionals. UI Pharmaceuticals has been operating for nearly 45 years and supports the manufacturing and testing of both clinical and commercial products. The seven departments that comprise the program are as follows:

- Sterile Manufacturing
- Non-Sterile Manufacturing
- Quality Assurance
- Analytical Services
- Preformulation and Formulation Development
- Business Development
- Engineering and Facilities

Center for Biocatalysis and Bioprocessing

The Center for Biocatalysis and Bioprocessing (CBB) (<https://cbb.research.uiowa.edu/>) is an academic center at the UI focused on advancing biotechnology through the creation and dissemination of discoveries in the biocatalytic sciences.

As an internationally recognized contract development and manufacturing operation (CDMO), the CBB facility specialized in the optimization and scale-up of complex bioprocesses to produce pilot-scale, high valued bio-based chemicals. Most notably, the CBB's facility fills a worldwide niche to produce recombinant proteins of commercial and research value.

A fraction of these proteins is produced under strict standards defined by the FDA, referred to as *current good manufacturing practices* (cGMP). The CBB's cGMP suite operates under the 2008 FDA guidance for Phase I clinical studies, which means the products produced under this standard can be used to determine the safety and efficacy of putative therapeutics. The CBB's

cGMP operation is ideally suited for startup companies with limited budgets who need information for the Chemistry, Manufacturing, and Control (CMC) section of their Investigative New Drug (IND) applications required by the FDA before Phase I clinical trial testing can begin. The CBB operates the only facility in the State of Iowa that manufactures vaccines and therapeutic proteins for Phase I clinical trials in people.

Clients range from international corporations to virtual startups. In addition, the facility's professional staff supports clients who are preparing SBIR/STTR grant applications and staff consults for companies preparing IND applications for the FDA.

III. University of Iowa's Economic Development Activities in FY22

- **UI Research Park**
 - The UI Research Park is home to 32 companies, employing over 1500 total employees, 800 of those located on the park. Total payroll associated with Park companies is more than \$3 million.
 - Companies residing on the Research Park, and in particular those residing in the BioVentures Center, have access to a variety of services, including: Shared laboratory equipment room; Executive board room and conference rooms; Multi-purpose room seating 70; Breakroom/vending area, atrium and lounge areas; Shipping/receiving area; High-speed wired & wireless internet; Emergency backup generator; Shared equipment room that includes: Autoclave, Laboratory glassware washer/dryer, RO/DI water system, Ice machine, -80° freezer; and Access to the UI libraries and the vast resources at the UI's CCOM via their core facilities.
- **UI Ventures**
 - UI Ventures currently supports 36 companies including 2 that formed in FY22.
 - Faculty and staff founded companies raised over \$74 million in equity funding in FY22.
 - UI Ventures continues to build a stronger economic development pipeline through programs that support business executive interactions, coaching and connections with investors, business strategy support, and other startup resources. In FY22, two UI faculty/staff companies were awarded \$620,569 in SBIR/STTR grants.
 - In FY22, 11 Innovation Fund awards were made across 5 colleges for a total of \$480,000 granted to faculty to aid the translation of their research towards commercial potential.
- **Iowa MADE**

- MADE had 4 products on the market in FY22 and students continued to develop an additional 4 products originating from the Colleges of Medicine and Dentistry, and the UIHC Dept of Nursing.
- MADE alumni continue to receive competitive job offers directly related to their work at MADE and are 100% employed upon graduation.
- MADE utilizes suppliers in Iowa to support the state economy and most of the MADE alumni remain in the region upon graduation
- **Protostudios**
 - The Protostudios UIHC office opened in August of 2020. UIHC Client traffic has been high with meetings almost every day.
 - Protostudios worked with 36 unique design clients in FY22 and another fabrication only projects for 50 clients.
 - The first student employed by Protostudios graduated in May and accepted a job in Johnston Iowa. His job is a virtual parallel to his Protostudios job experience.
- **Iowa JPEC**
 - Key metrics

○ Start-up Companies Served (New Business Starts)	493
○ Program, Seminar & Workshop Participants	5,531
○ Estimated Job Creation	347
○ Hours dedicated to Clients	12,533
○ Total Clients (Individuals receiving assistance)	807
○ Total Youth Impacted (K-12)	53,648
○ Seed Money Awarded	\$399,000
○ Total Participants Across All Programs	10,919

(Including Academic, Outreach, and Youth)
 - Academic Program – Iowa JPEC delivers campus-wide and online undergraduate education and technology innovation coursework in the MBA program. Majors (BA or BBA) and certificate programs exist for all undergraduate students at UI including specialized programs for students in engineering, performing arts, and journalism. During FY22, 4,566 students enrolled in 137 classes, 289 students received a degree and 139 students earned an entrepreneurship certificate.
 - Bedell Lab Student Incubator – The student incubator housed at the 10,000 sq. ft. Bedell Entrepreneurship Learning Laboratory has 17 private offices for the most advanced start-ups, numerous co-working spaces for the others, and several conference rooms. This campus-wide program is open to students from every college and major. The students receive intense mentoring and support as they launch or expand their businesses. The program, one of the first of its kind in the nation, has impacted 1,545 students since opening in 2004. During FY22, the Startup Incubator supported 38 student start-ups made up of 51 students.
 - Startup Incubator Summer Track - Throughout the twelve-week program, accelerator teams meet daily to launch their start-up by using Lean

LaunchPad methodologies. Through brunch-and-learns, work sessions with experienced mentors, weekly pitches, and lectures, the program aims to drive the start-up process for students, while increasing their start-ups' chance for success. In FY22, 18 teams and 26 students participated.

- Business plan and pitch competitions – Iowa JPEC hosts and sponsors a variety of elevator, business model and business plan competitions for UI students. During FY22, a total of \$399,000 was awarded to start-ups.
- Innovation Challenge – In order to increase campus-wide entrepreneurial activity and accelerate technology commercialization, a new year-long training program and competition launched in FY20. Administered by the John Pappajohn Entrepreneurial Center and co-sponsored by the Office of the Vice President for Research, UI Research Foundation and Office of the Chief Innovation Officer, the program had 127 participants in FY22.
- IdeaStorm Competitions are entry level pitch competitions that require no prior experience. Students simply share their idea with the crowd in two minutes or less. This introduced 71 new students to entrepreneurship in FY22.
- Jacobson Institute for Youth Entrepreneurship – The Jacobson Institute is a comprehensive program that enriches K-12 students' lives through classroom and practical educational experiences. Programming and impact include:
 - BizInnovator Program – Curriculum and teacher training focused on entrepreneurship and business. In FY22, 289 teachers from 231 schools in 42 states used the curriculum nationwide and impacted 12,668 students.
 - STEM Innovator Program – This professional development program for teachers infuses innovation and entrepreneurship into K-12 classrooms. In FY22, 378 educators from 147 schools in 17 states received curriculum, training, and support, impacting 40,091 students.
- Alumni-Student Mentoring Program – This program was established to connect entrepreneurship students with esteemed alumni to enhance students' professional and personal development for future success. In FY22, 127 students were paired alumni mentors.
- Okoboji Entrepreneurial Institute - Iowa JPEC established the annual, week-long Okoboji Entrepreneurial Institute (OEI) in a partnership among state of Iowa universities and colleges, as well as Iowa Lakes Corridor Development in 2006. To date, this summer program continues to provide students with an immersion into entrepreneurship and business strategy and develop an outstanding network of peers and business professionals. In FY22, 7 students participated for a total of 192 since inception.
- Student Organizations – Several campus-wide clubs and organizations focused on entrepreneurship are sponsored by Iowa JPEC.
- Venture School Entrepreneurial Training Program – Iowa JPEC offers an immersive “Lean LaunchPad”, business model canvas, seven-week boot

camp training program named Venture School to accelerate start-ups. Venture School is offered in multiple locations across Iowa. The program emphasizes real-world entrepreneurship through experiential learning, a flipped classroom, and immediate feedback. During FY22, workshops were offered in Coralville/UI, Davenport/EICC, Iowa City, Cedar Falls/UNI, Des Moines, Sioux City, Dubuque and Mason City/NIACC. There were 86 teams made up of 118 entrepreneurs.

- UI Small Business Development Center – The UI hosts an SBDC that serves a five-county area (Cedar, Johnson, Iowa, Poweshiek, and Washington counties). During FY22, the UI SBDC served 314 start-ups. This contributed to the creation of 103 jobs and \$12,680,630 in equity being raised.
- Institute for International Business (IIB) – The IIB is dedicated to advancing knowledge and international skills in business and educational communities through research, education, and consulting. During FY22, 4 International consulting projects were completed by University of Iowa students and faculty.
- Business Consulting Program – Iowa JPEC offers business consulting services to entrepreneurial and start-up companies around the state. During FY22, 88 projects were completed for 52 clients in 19 counties
- Iowa Innovation Associates Internship Program – Iowa JPEC provides funding support enabling Iowa start-ups to hire UI student interns as they work to grow their businesses. In FY22, 19 students were placed in 15 start-ups in these Iowa counties: Linn, Johnson, Polk, Dubuque, Scott
- Pappajohn Entrepreneurial Ventures Competition – In partnership with the Pappajohn entrepreneurship centers at ISU, UNI, Drake, and NIACC, Iowa JPEC sponsors this annual competition to support start-ups around the state. Each year, over \$50,000 is awarded in total to three companies.
- Wellmark Venture Capital Fund – Iowa JPEC is the regional administrator of the \$5 million Wellmark Venture Capital Fund that supports the creation and growth of new businesses throughout the state.
- NSF I-Corps Training Program – The University of Iowa was awarded a multi-year National Science Foundation (NSF) I-Corps Site grant in FY15 to support UI faculty, staff, and student entrepreneurs. This program is a joint effort between the Office of the Vice President for Research and Economic Development, the UI Office of Innovation, UI Ventures, and Iowa JPEC. The goal of this program is to accelerate 90 faculty and staff start-ups. During FY22, 44 start-ups made up of 61 faculty and staff participated.
 - Viewpoint Molecular Targeting, Firefly Photonics, and Juggernaut Life Sciences are examples of an early-stage businesses being supported by this program.
- Regional Partnerships / Eco-system Development – Iowa JPEC partners and engages with numerous local, regional, and statewide organizations to support entrepreneurs and contribute to the vital entrepreneurial ecosystem. These organizations include chambers of commerce, economic

development organizations, business accelerators, state agencies, other universities, and community colleges.

- National Engagement – Iowa JPEC engages with several national and international organizations focused on small business, entrepreneurship, economic development and technology commercialization. This includes not only membership but also committee participation and invitations to present best practices.
- **UI Center for Advancement**
 - Assists with aligning recruiting efforts and providing access to UI faculty and staff. It promotes corporate partner and foundation student scholarship and programming opportunities. UICA facilitates UI’s partnership with ICR Iowa to promote “Boomerangs” to return to the state to fill job openings.
- **UI Pharmaceuticals**
 - In FY22 UI Pharmaceuticals worked with ~100 different clients to manufacture and testing ~120 individual lots of material, resulting in ~\$22 million in total revenues UI Pharmaceuticals currently supports client programs across the United States as well as in Europe, Asia, Africa, and South America.
- **Center for Biocatalysis and Bioprocessing**
 - The Center generated \$3 million in annual revenue working with biopharma, commodity proteins and food products projects.
- **UI Research Foundation**

	FY16	FY17	FY18	FY19	FY20	FY21	FY22
Disclosures	151	93	143	83	95	101	103
Licenses + options	40	58	51	48	37	47	48
Patent applications	297	148	153	160	146	95	188
Issued patents	67	42	74	54	72	86	80

Regents Innovation Funds Spent to Promote Economic Development in Iowa

- Protostudios: \$248,350 for personnel and general expenses
- UI Research Park: \$85,962 for BioVentures Center personnel, operating/general expenses
- UI Ventures and MADE: \$553,486 for personnel, consultants, student interns, award and general expenses

The University of Iowa recognizes the important role it has to play in the state’s economic development ecosystem. The university is committed to improving the quality of life in Iowa through a sustainable cycle of research and creative activity. Research at the University of Iowa makes Iowa a healthier, more prosperous, and attractive place to live. The university will continue to ensure that every dollar invested in research is leveraged by developing new economic opportunities for Iowans.