

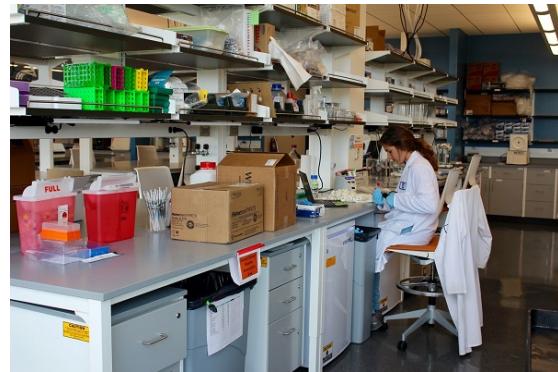
CICEP | INNOVATION AND ECONOMIC PROSPERITY UNIVERSITIES  
AWARDS PROGRAM

CASE  
STUDY  
2016

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**Massachusetts Medical Device  
Development Center (M2D2)**

## UMASS LOWELL MASSACHUSETTS MEDICAL DEVICE DEVELOPMENT CENTER (M2D2)

UMass Lowell is committed to developing the region's technical and scientific workforce. Located 35 miles north of the Boston/Cambridge Life Sciences Supercluster, the university is uniquely situated to provide students with the education and work experiences needed to thrive in this growing industry. One example of our success in developing an "applied education to career pipeline" links our investment in the Massachusetts Medical Device Development Center (M2D2) to startup internships and a new biomedical engineering undergraduate program.



M2D2 leverages the engineering and business strengths of the UMass system's Lowell campus along with clinical and research strengths of its medical school in Worcester to support the development of new medical device startup companies across Massachusetts. Since 2010, the startup companies M2D2 has worked with have raised over \$58 million dollars in private investment funds and \$9 million dollars in federal and state grant and loan guarantees. Those firms directly employ 152 people and support the employment of another 218 in the medical device supply chain. Data is collected on an annual basis as part of M2D2 reporting metrics. Funds raised per company and employee counts were accurate as of January 2016. Supply chain employment based on industry multiplier. [A 2015 economic impact study conducted by the UMass Donahue Institute](#) found that M2D2 affiliated startup companies generated \$75 million in economic activity in the greater Lowell region and supported the creation of 370 jobs.

M2D2 originally focused on helping medical device companies develop early-stage prototypes and secure investment funding. However, as demand for M2D2's services increased, it became apparent that these startups also required specialized workspace. While the university could accommodate tooling and machine work in existing facilities, wet labs were a scarce resource. Entrepreneurs also needed office and conference space in which to convene partners and investors. In 2011, with the support of the Executive Office of Housing and Economic Development, M2D2 opened a 14,000-square-foot facility in Lowell with private wet lab space, office space, conference space and areas for collaboration. This facility currently houses 15 medical device startups.

The initial success of this space led to the opening of a new 11,000-square-foot facility in June 2015, doubling the capacity of M2D2. In this facility, life sciences startups have access to wet labs, cell culture labs, high-end research equipment and each other. By June 2016 we hosted an additional 10 startups in this facility, operating at 40% member capacity. We expanded sponsorship to include large corporate partners like Smith & Nephew, Johnson & Johnson, Becton Dickinson and Boston Scientific – while also growing supply chain partners, the SMEs that provide consulting and development services to our startups. This has created new opportunities for our startups in fundraising, product development and acquisition planning. Our sponsorship funding has grown from \$30,000 in 2012 to \$293,000 in 2015, funds that are critical in supporting prizes awarded to startups in our ecosystem.

UMass Lowell is committed to economic development in the Commonwealth, and to providing our students with real-world learning experiences. M2D2's location on our East Campus facilitates startup engagement with university researchers, students and alumni investors. Startup companies in the M2D2 incubator utilize the campus core research facilities and hire undergraduate and graduate student interns. Over 45 students – from majors like engineering, clinical lab sciences, business and marketing – have been placed in M2D2 startups over the past four years. Lowell leads colleges in Massachusetts in leveraging Mass. Life Sciences Internship Challenge funds, in part due to the presence of M2D2 on campus. These internships provide our students with critical insights into work in life sciences, while assisting in the development of nascent life sciences startup companies.



While the Boston area is known as a "Life Sciences" hub, the area immediately surrounding Lowell has become a hub for medical devices, with firms such as Boston Scientific, Covidien, C.R. Bard, Medtronic, Philips, Siemens and ThermoFisher Scientific. These companies directly complement M2D2 and the startups supported by our program. The companies also need skilled employees who can design, develop, test and manufacture these products and devices.

To expand on our initial success with M2D2, we developed an undergraduate biomedical engineering program that will train future employees of this growing cluster. According to the U.S. Bureau of Labor Statistics, the biopharmaceutical industry grew from 40.4 million jobs in 2003 to over 56.4 million in 2012. Massachusetts has a huge presence, with firms such as Biogen, Genzyme, Johnson & Johnson and Pfizer. A recent "CNN Money/Payscale Top 100 Careers Survey" ranked "Biomedical Engineer" as No. 1, with a 10-year job growth of 62%.

Our new biomedical engineering program is the first offered by a public university in Massachusetts. The program includes coursework in medical device design and development, biomedical engineering, human anatomy, biology, chemistry, biomedical engineering and entrepreneurship. The most common specializations in biomedical engineering programs focus on bioinformatics, biomechanics and bioimaging – our focus on medical device design and development is unique and, as noted, addresses our region's employment needs. Another unique aspect of this program is its commitment to broadening participation by women and underrepresented groups in engineering. By aggressively recruiting and marketing to alumni, the biomedical engineering program at UMass Lowell aims to increase women and minority student representation. To date, 45 honors students have been accepted into the inaugural freshman class (Fall 2016), 45% of which is female.

From a university perspective, M2D2 contributes to its economic development mission, while providing important learning opportunities for students. We are helping to grow the medical device industry in Massachusetts while simultaneously preparing tomorrow's life sciences workforce.