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Innovation District in Massachusetts Offers Unique Blend of Intimacy and Proximity to Host BIO2018

By Abigail Barrow

Massachusetts continues to be recognized as the leading life sciences cluster in the world. The stream of companies being welcomed by the Massachusetts Governor and the state's Life Sciences Center seems to be endless with the arrival of new companies - from giants like 330,000 employee General Electric moving its corporate headquarters to Boston, to emerging companies like Belgium's 17 person Ontoforce which is opening a new subsidiary office in Kendall Square. The incoming firms join the robust community of locally established companies and newly forming start-ups.

While there are many factors that have made the growth and leadership of this cluster extraordinary, a key part of the story is the strong research base at the world-class universities, hospitals and research institutions in the region.

Massachusetts is the home of over 100 universities and colleges - with Harvard University and the Massachusetts Institute of Technology being the best known, but with many others including Boston University, Tufts University, Northeastern and the University of Massachusetts having significant life sciences research capabilities. Seven of the top 15 National Institutes of Health funded independent hospitals are located in the state. To round out the non-profit research community these universities and hospitals are joined by a number of specialized research institutes, like the Whitehead and the Broad. In the life sciences these organizations are primarily funded by the National Institutes of Health funding - which in 2015 directed almost \$2.5 billion in funding to the state. However, this funding is supplemented by significant awards from other Federal agencies, such as the Department of Defense and the National Science Foundation, that also support research relevant to the life sciences.

Importantly over the last ten years, the state of Massachusetts itself has made significant investments in infrastructure funding to ensure that these institutions remain international leaders. Through the Massachusetts Life Sciences Center, capital grants of over \$400 million to both public and private non-profit research institutions have enabled the construction of new laboratories and the acquisition of new equipment. Investments such as the two newly installed cryo-electron microscopes at the University of Massachusetts Medical School, funded by the Massachusetts Life Sciences Center as well as the Howard Hughes Medical Institute, ensure that the research institutions have access to the best equipment in the world. Regional

companies are also able to take advantage of this regional investment through sponsored research and fee-for-service arrangements.

Combined, these Federal and state investments mean that the vibrant research community creates a pipeline of well-trained and motivated employees that make the commercial research laboratories some of the most productive in the world. From trained technicians to



Massachusetts Life Sciences center

senior leadership the impact of vocational and research training is evident in every company in the region. With examples such as Dr. Jay Bradner, now President of the Novartis Institutes for BioMedical Research (NIBR) and formerly at a physician-scientist from Dana-Farber Cancer Institute and Harvard Medical School, and Dr. David Altschuler, who was the deputy director and chief academic officer at the Broad Institute and now CSO at Vertex Pharmaceuticals, this impact can be seen at the highest levels.

Secondly, scientists at the research institutions make a large number of new discoveries and create a formidable amount of intellectual property. This forms the basis for the many spin-off companies that are created each year. In 2015 almost 70 new companies were started based on licenses from Massachusetts research institutions. These newly formed companies are supported by a well-developed ecosystem of incubators, accelerators, CRO's, professional service providers and of course investors - including angels, venture capitalists and corporate funds. Massachusetts institutions also license technologies to existing companies, and in 2015 received over \$270 million in licensing income in all technology areas.

Finally, and perhaps the most important contribution from the research institutions has been the development of an open and collaborative research environment. Scientists cross the street to collaborate with colleagues at other laboratories, to discuss new research approaches and to share ideas. It is a well networked community that meets regularly at events - but also serendipitously at random meetings on the street in Kendall Square or Longwood or on the subway. These formal and informal collaborations are not limited to the life sciences but across many disciplines and industries so they lead to new opportunities in all sectors. For example, a nanotechnology developed by biomedical research Prof. Robert Langer formed the basis for Living Proof, a shampoo and hair care company recently acquired by Unilever.

We look forward to welcoming you to Boston for next year's convention. I hope that while you are in the region you will be able to meet with some of our leading researchers and hear about the breakthroughs that are being made in our research institutions. If you have the opportunity please try to visit the Innovation District or Kendall Square and see the proximity and intimacy that makes this region so special for life sciences. ■

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