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DEVELOPMENT HUBS

Rust no more

Ohio's investments into research are ushering the state from a manufacturing past into a knowledge-economy future.

BY CAMERON WALKER

For generations, Ohio's economy has been centred around industrial manufacturing and agriculture, thanks in large part to a location on the western side of the historically factory-rich region of the United States and the eastern reaches of the vast fields of the corn belt. But in the past decade, this Midwestern state has begun to transform itself into a manufacturing hub of a different kind. A US$2-billion infusion of state funding to develop the state's technology economy, along with a cluster of research institutions and a steady proliferation of start-ups, have resulted in an outpouring of research and tangible goods in an array of sectors from pharmaceuticals and agriculture to medical testing and devices.

Much of the state's research, development and technology transfer take place in its largest cities — especially Cleveland, Columbus (the capital) and Cincinnati. That is largely because they contain the most institutions, including Ohio State University in Columbus and the Cleveland Clinic and Case Western Reserve University in Cleveland. Researchers there and elsewhere in the state attracted $685 million in biomedical funding from the US National Institutes of Health (NIH) last year, putting Ohio among the ten states that receive the most such funding annually. In 2012, a combination of NIH funding, further federal grants, industry funding and private money gave Ohio's researchers a grand total of $1.3 billion to spend on bioscience, according to Battelle, a non-profit research organization in Columbus, and the Biotechnology Industry Organization in Washington DC.

UP, UP, UP

All this investment has been producing jobs in both academic and industrial bioscience research, even during the recent recession. Between 2007 and 2012, biosciences employment in the state's private sector rose by 2.2% to a total of 48,294 jobs, while the national rate remained essentially flat, says Battelle's Ryan Helwig. In several sectors, including pharmaceuticals; agricultural feedstock and chemicals; and medical devices, which alone involves 4,523 jobs and just in the Cleveland area, employment grew by double digits during that period, outpacing national hiring in these sectors. Although these jobs include sales and manufacturing positions, companies such as Neuros Medical near Cleveland are also seeking research scientists. In 2015, the company plans to recruit biomedical engineers, clinical managers and field clinical specialists, among others, as it continues pivotal clinical trials on an implantable nerve-blocking device to treat pain for people who have had amputations.

Much of the growth in medical devices and other private-sector ventures stems from research initiated at the state's universities and institutions and from researchers who have followed an entrepreneurial path. One of these is cardiologist Marc Penn, founder and chief medical officer of three biomedical companies, including Cleveland HeartLab, which develops and performs diagnostic tests to assess ▶

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cardiovascular-disease risk. Although many institutions are going through a steep learning curve when it comes to technology transfer, he says, "the opportunities outweigh the risks" for researchers interested in working in Ohio.

Perhaps the state's biggest system for converting its bioscience research into goods, services and businesses is a $2.1-billion taxpayer-supported initiative called Third Frontier, based in Columbus. Launched in 2002, it aims to support the development of technology-based products, companies, industries and jobs; one programme designed to commercialize biomedical research received more than $151 million in state funds in 2013.

Between 2009 and 2012, Third Frontier invested in 1,080 companies, including 205 in agricultural bioscience and medical technologies. Its investments were directly responsible for creating or retaining 7,780 jobs during this period.

Two of the most recent recipients are in turn funding bioscience research in Ohio and nationally. In June, Third Frontier awarded the Harrington Discovery Institute at University Hospitals in Cleveland — the non-profit arm of The Harrington Project for Discovery & Development — $25 million to advance its efforts to commercialize drug discoveries. As well as giving physician–scientists in the United States a base amount of $100,000 over two years, the institute connects them with entrepreneurial and pharmaceutical development teams to help to shepherd their findings to market. Some 31 projects are en route to becoming drugs, with a biomedical start-up around each. The Harrington Project plans to support at least 50 such projects at any given time, says Baiju Shah, chief executive of BioMotiv, The Harrington Project's for-profit arm. Shah says that BioMotiv may be seeking project managers, particularly those who have experience in managing pharmaceutical development, to lead those fledgling businesses.

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Third Frontier has also supported Ohio's growing neurotechnology field. In June, it awarded $21 million over four years to the Neurotechnology Innovations Translator, a for-profit partnership between Ohio State and other research institutions, health-care companies and venture-capital firms among others that aims to create and grow neuroscience technology businesses and will begin funding projects in early 2015.

"There are a lot of opportunities with the companies that we're developing to attract scientists and engineers," says Ali Rezai, a neurosurgeon at Ohio State and principal investigator for the translator. He estimates that the companies that emerge from the project will generate at least 160 jobs, including positions for researchers and engineers.

GLOBAL CENTER FOR HEALTH INNOVATION

At the Global Center for Health Innovation, researchers can showcase their innovations and technologies.

Ohio State is also expanding its faculty as part of an initiative that seeks to produce collaborative research, teaching and outreach in theme areas of food production and security, energy and the environment, and health. In the next 10 years, it intends to increase the number of tenured and tenure-track faculty members by 8–10%, or about 300, with a particular focus on bioscience disciplines related to the initiative's themes.

At present, the university has set aside $60 million for tenure-track positions in data analytics, emerging and re-emerging diseases, sustainable materials and food to improve health, with the first recruits expected on campus by autumn 2015.

In June, an effort was launched to bring Ohio's research institutions into a network that will help researchers to develop and run clinical trials in areas such as neuro-oncology, neurosciences, paediatrics and infectious diseases. Organizers of the Cleveland-based Ohio Clinical Trials Collaborative, a multi-institution partnership that has received two years of state funding, intend for it to become self-sustaining by 2016.

It has already made many national and international industry contacts and has close to 30 trial opportunities in development, says John Peterson, the project's global business-development director. As more industry-sponsored trials come to the state, the collaborative and participating hospitals will need more research and support staff, he says.

ON DISPLAY

Several large multinational and national companies have headquarters or outposts in Ohio, from Proctor & Gamble to Battelle. Last autumn, Cleveland opened the 2-hectare Global Center for Health Innovation adjacent to the new Cleveland Convention Center. The centre has four floors of permanent showrooms that companies and institutions — including Philips and University Hospitals — are occupying. "That's another symbolic commitment of the state and the region" to bioscience, says Aram Nerpouni, president and chief executive of BioEnterprise, a Cleveland-based business formation, recruitment and acceleration programme.

From 2002 to this year, Cleveland's biomedical cluster grew from 300 companies to more than 700. Around the state, business-support organizations such as the Youngstown Business Incubator and TechColumbus — as well as bioscience-specific efforts, including the Global Cardiovascular Innovation Center in Cleveland — help entrepreneurs to launch start-ups.

Before Goutham Narla, a medical geneticist at Case Western's School of Medicine, came to Cleveland from Mount Sinai Hospital in New York City to explore a potential job, the state of Ohio had never been on his radar. But now he and his wife, cancer biologist Analisa DiFeo, love it. Along with its world-class researchers, the region has an ideal combination of ambition and amiability. It is not so laid-back that nothing gets done, but also "not so cut-throat that you're wondering if you can trust anyone, even your colleagues", Narla says.

The five graduate students who came with Narla from Mount Sinai have enjoyed the region's lower cost of living and easier entrée to top-shelf research institutions and researchers. Early-career scientists often find it difficult to tap into the high-level networks based on the east and west coasts, Narla says, but that is not the case in Ohio. "That's a neat thing here — you have a lot of access, because people are more welcoming." ■

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