University Research Parks: The Triple Helix and Communities of Innovation

By **Eileen Walker,** CEO, Association of University Research Parks

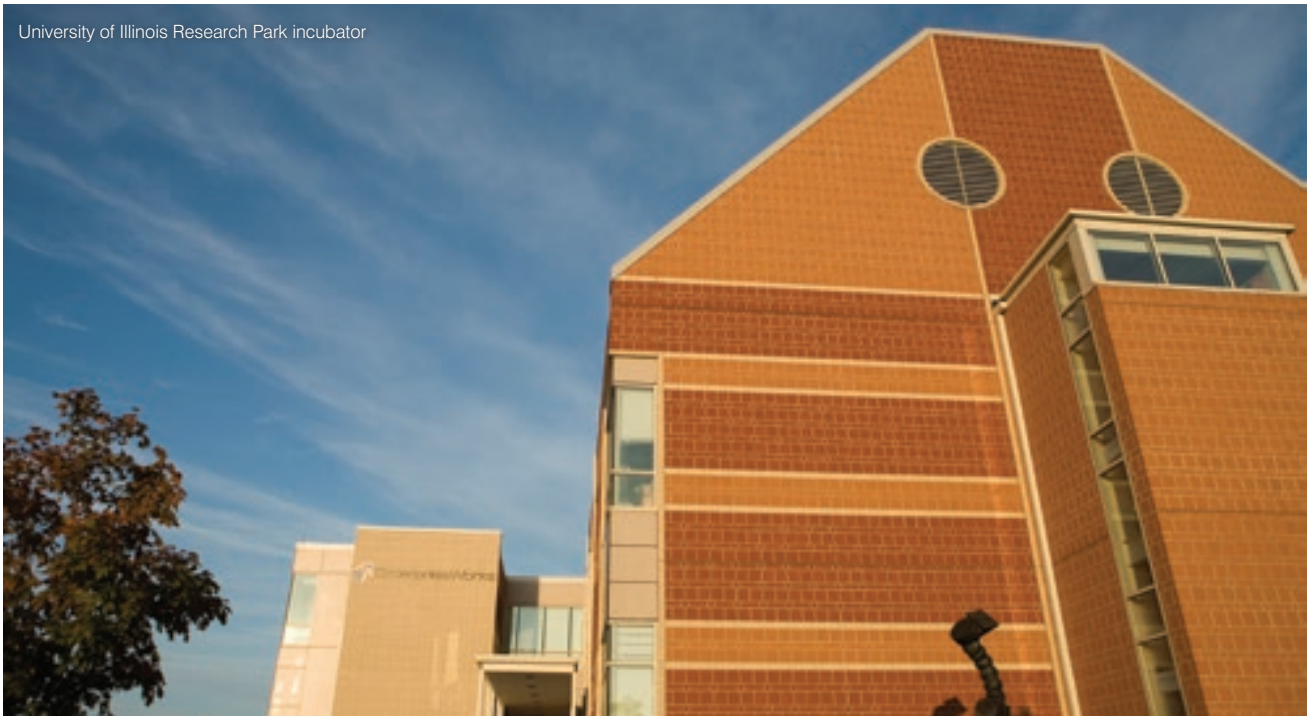
In a research laboratory on a college campus somewhere in the world, a team of innovators arrive at a promising, perhaps even world-changing discovery in nanotechnology, biomedicine, renewable energy, or the like. One part of the heavy lifting is done, but now comes the second: how does this promising invention move quickly from discovery into the marketplace, where it can help create high-wage employment and prosperity, even as economies struggle to emerge from recession?

One answer to this question is in university research parks, where harnessing international investments in research and education and promoting university, industry and government collaboration are the order of the day. These places – variously called university research, science or technology parks – are increasingly where these partnerships happen, and where important innovations occur and discoveries are made.

Particularly in the United States, universities have expanded their economic development roles and are partnering with government, industry and academia to form a powerful "triple helix." David Baker, vice president for external affairs at the Illinois Institute of Technology, notes, for example, that the greater Chicago area has emerged as an international centre of nanotechnology, medical diagnostics and pharmaceutical design and manufacture precisely because world-class schools such as Northwestern and the University of Chicago, as well as IIT itself, have taken the lead in forging these alliances.

"Because we're within easy reach of robust, high-end universities, a research community has flourished here," Baker says. "We're now working to expand on this by trying to accelerate the growth of small companies to take advantage of all the large hospitals, schools and pharmaceutical companies in the region. The investment climate is good and we are seeing nothing but solid growth." Some of those small companies have seen marked growth themselves, including Therapeutic Proteins International, a global developer of biosimilar recombinant therapeutic proteins; Sword Diagnostics, a next generation detection system for ultrasensitive immunoassays, and Chromatin, Inc., a biotech company developing technologies and products that benefit the agricultural, energy, and pharmaceutical sectors.

The challenge for companies in university research parks in Illinois and other states is to secure "angel investors" willing to wait patiently for ideas to become reality and income to flow. The University of Illinois Research Park, located downstate in



University of Illinois Research Park incubator


University of Kentucky Coldstream Research Campus

Urbana-Champaign, has been particularly effective in assisting companies to attract angel investors. While UI Research Park clients include some of the largest corporations in the world, including the agricultural giant ADM and the pharmaceutical leader Abbott Laboratories, UIRP is attentive at nurturing start-ups, more than two dozen of which have emerged from the research conducted at the university.

Western Arkansas forms another growing centre for triple-helix endeavours. The Arkansas Research and Technology Park has recruited numerous medical-technology firms whose products have found immediate investment – and immediate markets, too. One, developed by BiologicsMD, is a pharmaceutical treatment for osteoporosis and other bone-related maladies. Another improves food product safety by manipulating strains of the E. coli bacteria under a $1 million (£625,000) grant from state and federal sources. “Under the grant, we had to make customer contacts to validate whether or not what we were doing made any sense, commercially,” says chief scientific officer Ellen Brune. “Every one of the first 15 people we contacted said, ‘Can you have this to me tomorrow?’...People seriously wanted this.”

The corridor formed by the Texas cities of Austin, San Marcos and San Antonio is also emerging as a nationally important technology centre. At Texas State University’s Science, Technology and Advanced Research (STAR) Park, notes executive director Stephen Frayser, the largest partner is a UK-based company, MicroPower Global, which has developed semiconductor material that allows for the affordable conversion of heat waste to energy. Numerous other partners and investors are from elsewhere in Europe. So vital is UK trade to the corridor, Frayser adds, that British Airways has announced that direct nonstop flights between Austin and London Heathrow will begin in 2014.

University research parks face many challenges, and not just those associated with an economy that seems slow to emerge from downturn. A particularly thorny problem is to remain competitive in a time when funding of academic science and engineering research and development has failed to outpace inflation, as the National Science Foundation reports, and when R&D investments generally have fallen dramatically over the last few years. The government of China, whose economy has been a model of tenacious growth in recent years but, until now, has not been known for as a source of the new, has established a multi-year framework to become more innovative and thus even more competitive. Singapore has become an incubator of new products and technologies, while Finland has merged its top business school, design school and technology school to create a multidisciplinary “university of innovation.”


Arkansas Research and Technology Park Innovation Center

University of Kentucky: Coldstream Center Incubator

American universities have their work cut out to keep ahead of the competition. While many American states have been reluctant to spend money on public education at any level, others have been vigorous in supporting researchers and workers for a high-technology future. Connecticut, for example, has pledged $2 billion for its state university's "Next Generation Connecticut" initiative, which will expand research areas such as materials science, physics, biology, and related disciplines. Notes Rita Zangari, director of the UConn Research Park, this initiative accompanies other state programmes which will fund a new research hospital at a cost of more than $1 billion. These initiatives will also include "creating incubator space," as she says, for biotech and related spinoff industries. One facility, the Jackson Laboratory for Genomic Medicine, is planned to accommodate 300 biomedical researchers, technicians and support staff by 2020. Along with the hospital funding, the state has established a $200 million fund for biosciences investment, targeted particularly at start-ups. It is no surprise, given these sort of funding commitments, that the University of Connecticut has risen rapidly in the last decade to a spot among the top twenty public universities in the United States. Says the state's governor, Dannel P. Malloy, "UConn's ranking is evidence that these investments are paying off, and will continue to do so for years to come."

In other states, investment takes the form of tax incentives for private concerns. Notes STAR Park's Stephen Frayser, Texas enjoys a favourable regulatory and tax environment, with tax credit offered for R&D and an exemption of the first $1 million in earnings from corporate tax. Similarly, Baylor's Vice Provost for Research Dr. Truell Hyde observes, Baylor University is benefiting from a "thriving entrepreneurial environment." Baylor University Research and Innovation Collaborative (BRIC) is emerging as a regionally important business incubator, providing services to support industry university research, including intellectual property and patent protection and market assessment.

The benefits of university research parks to local communities and whole states alike are many. Says George Ward, executive director of the Coldstream Research Campus at the University of Kentucky, "working with central Kentucky's technology-based economic development professionals, I see first hand on a daily basis how Kentucky's investment in university research has changed the state's business mix, tax base and communities. Whether its the University of Kentucky recruiting another world-class scientist, or an entrepreneurial faculty member starting a company and hiring young, well-educated graduates into well-paying positions, our state benefits greatly from the 'brain gain.'"

Adds Ward, "the University's high-tech business incubator, the Advanced Science and Technology Commercialization Center (ASTeCC), has created dozens of high-tech companies that typically emerge through the help of federal research funds." Since March 2007, he says, "the federal government has awarded thirty-three Fayette County small businesses more than $28 million. These small businesses have also benefited from an additional $18 million in funding from the Commonwealth of Kentucky's matching-grants programme. Much of that money has been directly spent in the community in the form of salaries, rents and the like. It's trickle-down economics that works, in other words."

University research, science and tech parks are important tools – not only for creating and maintaining employment in today's high technology sectors, but also as the places where discoveries happen and the economy of the future will be born. Throughout the United States, those parks are flourishing, offering opportunities for investment and growth.

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ASSOCIATION OF UNIVERSITY RESEARCH PARKS

Creating Communities of Innovation