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Future Pharmaceuticals speaks with **ANTHONY DENNIS,** President and CEO of the group **BioOhio**, on what the Buckeye State has to offer in the realm of biosciences

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Future Pharmaceuticals **What is the size and composition of Ohio's bioscience industry?**

Anthony Dennis My organization, BioOhio, is the economic development association for the state of Ohio in the biosciences. We identify three main segments to the bioscience industry because of their impact and interrelationship: bioscience manufacturing and services industry, academic research medical centers and healthcare providers. Combined, these industries account for $146 billion or 17.6 percent of Ohio's gross state product (GSP). The industrial sector alone accounts for $27.3 billion of the GSP and 128,000 direct and indirect jobs. More than 50 percent of the 1,162 companies that comprise the industry in Ohio are medical device manufacturers or suppliers and about 25 percent of the total are involved in pharmaceuticals research and development or manufacturing. As a state, we also have a robust contract research organization (CRO) and contract manufacturing organization (CMO) industry, including Charles River Laboratories, Kendle International, Medpace, and WIL Research Laboratories, among others.

In terms of ranking, a combination of more than 20 factors — including company expansions, National Institute of Health dollars granted, and state investments in the biosciences — convinced Business Facilities Magazine to rank Ohio number four in the nation in biotech strength. For the last three years, Ohio has ranked either first or second of the Midwest states in venture capital and private equity investments in the life sciences, with around $289 million in this last 12-month period invested in start-up biotech and bioscience companies.

Also, for three of the last five years, Ohio has won Site Selection Magazine's "Governor's Cup" for the most new or expanded capital projects of any state in the nation, which includes either major relocations — such as Amylin Pharmaceuticals — or significant corporate expansions — for example Cardinal Health, Ben Venue and Roxanne Laboratories.

FP **What factors have contributed to the growth of bioscience in Ohio?**

AD One lies with our very visionary state government, which has many initiatives supporting private industry and the academic sector. We have outstanding academic research, a low cost of business and an abundant and talented workforce, which makes for the perfect opportunity to grow a biotech business.

The state established the $1.6 billion Third Frontier Project nearly seven years ago — it is slated for renewal based on its success — and nearly 40 percent of those investments have been used to establish preeminent public-private partnerships in the biosciences. Third Frontier is reviewed by the National Academy of Sciences and has formed entities such as the Global Cardiovascular Innovation Center at the Cleveland Clinic with $60 million in state funds and $180 million in private matching funds. Other examples include the Advanced Medical Imaging Center at The Ohio State University and the Computational Medicine Center at Cincinnati Children's Hospital Medical Center. Clinically, Ohio consistently ranks in the top three states in "Best Hospitals" as ranked by U.S. News and World Report.

Academically, Ohio is ranked number 10 in the nation for NIH funding of basic and translational research and has, for instance, one of four National Science Foundation-funded nano-biotechnology centers in the nation.

The cost of business in Ohio is significantly less than on either coast and with sweeping tax reforms in place, it is becoming a preferred destination for corporate expansions. All evidence

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supports that Ohio's tax reform is working as planned. Elimination of taxes — on capital investment, inventory, sales of goods and services to customers outside of Ohio, as well as corporate income and franchise taxes — helps make Ohio the ideal location to build a successful global business.

FP How has the bioscience industry impacted Ohio's economy?

AD The bioscience industry is the most rapidly growing industry in the state in virtually all ways — capital invested, companies started and jobs created, among others. A recent report indicates that one out of 12 Ohioans works directly or indirectly for an academic medical research center and one in five works either directly or indirectly in the broadly defined biosciences sector. The $362 million that Ohio has invested in the biosciences since the inception of the Third Frontier program has been matched nearly nine-to-one with federal grant or private dollars to dramatically increase Ohio's bioscience research and industry base.

Ohio has recruited eminent scholars from around the world in selected areas such as cancer and cardiovascular research and development. Many of Ohio's bioscience companies have expanded significantly in the past five years with numerous capital expansion projects adding construction jobs and then high paying pharmaceutical research and manufacturing jobs.

FP What notable bioscience companies are located in Ohio?

AD There are quite a number of them, so I will just highlight a few. Affymetrix is one company that just bought an operation in Ohio and is expanding. Alkermes, out of Boston, has a major manufacturing operation in the state and Amylin Pharmaceuticals, headquartered in San Diego, Calif., has their global manufacturing facilities here. Battelle, a major research institution, is also headquartered in Ohio. Ben Venue and Bedford Labs, both divisions of Boeheringer Ingelheim, the world's largest privately held pharmaceutical company based in Germany, does most of their manufacturing in the state as well. Cardinal Health, P&G Pharmaceuticals, and Philips Medical Systems are all located in Ohio.

It's a very significant cross-section of the pharmaceutical medical device and medical support activities in the nation. One subsection I'd particularly like to highlight is the CROs, because they are growing at an outrageous pace; these include Kendle International and Medpace.

FP What research capabilities does Ohio offer?

AD Given the fact that we are ranked number 10 in NIH funding in the country, there's a lot of research that goes on in the state and is pretty broad in terms of the focus areas. Some key areas of expertise where high concentrations of talent exist include: cardiovascular disease, cancer and neurological disorders.

Also, medical imaging and medical informatics are very strong, in fact, Philips Medical Systems in the Cleveland area, moved their entire magnetic resonance imaging (MRI) operation from overseas into Ohio to take advantage of some of the resources here; there's tremendous growth going on in the state in this area.

The physical research infrastructure is significant with state-of-the-art facilities in all areas. It seems that construction has been nonstop at all of Ohio's leading research centers with new or renovated facilities in all corners of the state. In addition to the main research facilities, support services — such as Ohio's Supercomputer Center and the Genome

> "NEARLY 20 PERCENT OF ALL THE CLINICAL TRIALS PERFORMED IN THE UNITED STATES ARE PERFORMED IN PART OR IN WHOLE IN OHIO."

Research Institute — provide state-of-the-art capabilities to all of Ohio's research community, both academic and industrial.

FP What does Ohio do to support the state's bioscience industry?

AD The state has devoted approximately 40 percent of the Third Frontier expenditures to date to the biosciences, or more than $362 million. In addition, the state is launching a three-year $1.57 billion Jobs Stimulus initiative, $100 million of which is devoted to the expansion, attraction and growth of the biomedical industry.

The state aggressively supports companies expanding or relocating operations to Ohio with excellent incentives — from very low interest capital loans to tax credits. The state offers an R&D tax credit which has significantly increased private investment in bioscience start-up companies. Also, the Ohio Venture Capital Authority has been established to stimulate the formation of various forms of private investment. Five years ago, for example, Ohio had fewer than six start-up funding sources and today has more than 58 sources of capital serving the emerging bioscience industry.

Ohio has long supported a bioscience technology commercialization infrastructure, as represented by BioOhio and our regional affiliates, BioEnterprise in Cleveland, BioStart in Cincinnati, the Edison Biotechnology Institute in Athens, and the Regional Growth partnership in Toledo.

BioOhio is funded by the state to provide a broad range of services — from helping start-up companies raise capital, to working with our academic centers to commercialize world-class technology. BioOhio is establishing an aggressive workforce program for the biosciences including working with regional community colleges to develop model two-year and associate degrees for our industry. State leadership in both the administration and the legislature aggressively support our industry with special leadership from Lee Fisher, our Lieutenant Governor and head of our Department of Development. Emphasis on science, technology, engineering and math (STEM) education at all levels of K-12 and beyond is revolutionizing the talent base in the state now and for years to come.

The University System of Ohio helps Ohio's major institutions recruit eminent scholars and focus their clusters of excellence. Regional entrepreneur services have been organized and are well-funded through the Third Frontier, including significant incubator space in all corners of the state and business support services. State leadership articulates this process by showing a model commercialization pathway and their intentional support for each phase of the process — from idea generation to company expansion.

FP What clinical resources exist in Ohio?

AD That's one aspect we really excel in as a state; nearly 20 percent of all the clinical trials performed in the United States are preformed in part or in whole in Ohio. Ohio has very high quality hospitals with many of them moving to electronic medical records, which is almost *di rigour* today for doing an effective clinical trial.

We are also home to many CROs, which routinely source their trials here in the state. It's a great trial state. Coupled with a cooperative and willing population, clinical and translational medicine is a real strength for the state. **FP**

OHIO'S LARGEST BIOSCIENCE CLUSTERS

- Pharmaceutical manufacturing, packaging and logistics
- CROs, including clinical trials management, preclinical and clinical R&D, contract manufacturing
- Medical device R&D, manufacturing and supply chain
- Drug delivery technology, application, and manufacturing
- Agricultural bioproducts

OHIO'S LARGEST RESEARCH CLUSTERS

- Cardiovascular
- Neurosciences
- Pediatric diseases and genetics
- Adult stem cells
- Medical imaging
- Cancer
- Medical informatics
- Aerospace medicine

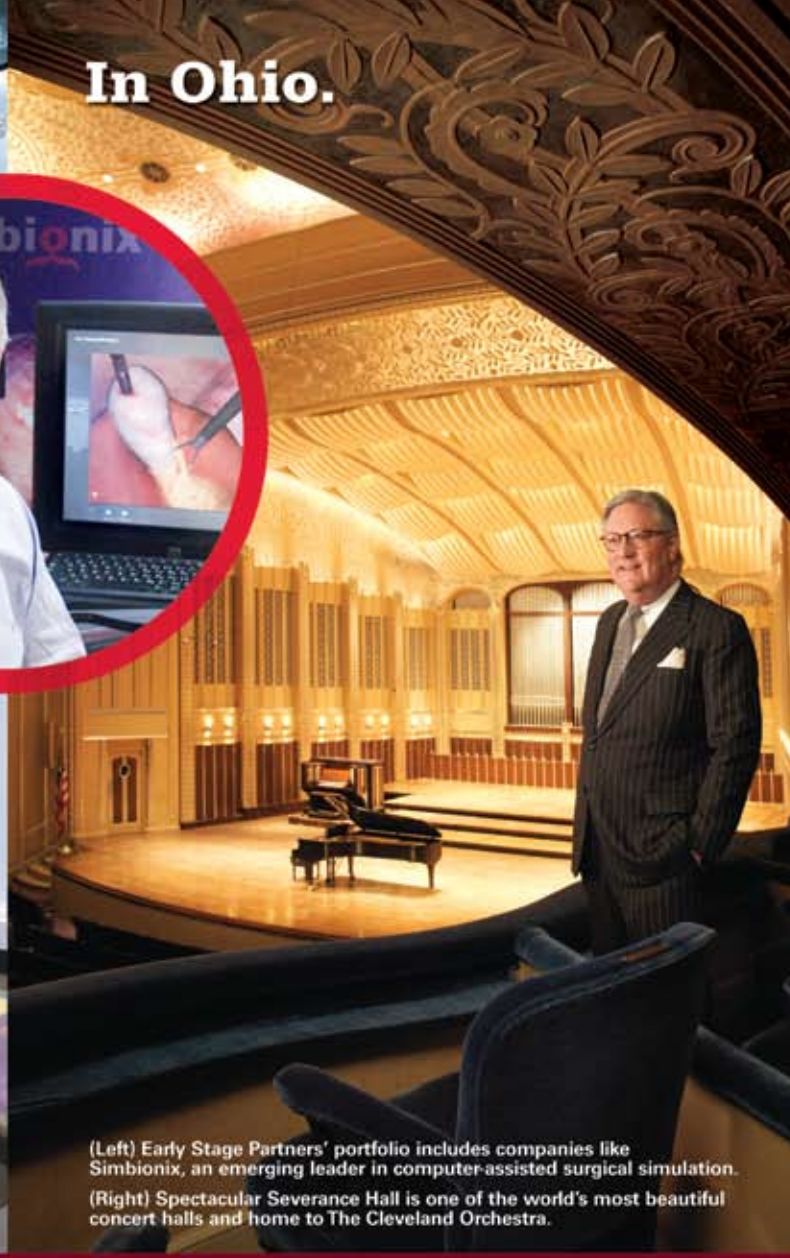
OHIO'S LARGEST TRANSLATIONAL MEDICINE CLUSTERS

- Nationally ranked pediatric centers in Cleveland, Columbus and Cincinnati
- The Cleveland Clinic and Case Western translational medicine institute
- The Ohio State University Personalized Medicine Initiative
- The Air Force Institute of Aerospace Medicine

ANTHONY DENNIS, President and CEO of BioOhio, is an entrepreneur, microbiologist, technology advocate and native Ohioan. Mr. Dennis received his B.S. and Ph.D. degrees in microbiology from The Ohio State University. He started his career at Battelle Memorial Institute in the 1980s, first as an entry-level researcher and eventually as Vice President for biotechnology. Mr. Dennis was the Co-founder and Executive Vice President of BIO-NOVA in Portland, Ore., prior to joining BioOhio. Here he was also a Director of the Oregon Biotechnology Association and consultant for the Oregon Resource and Technology Development Account.

Jamie Ireland ventured away from Wall Street for better balance.

In Ohio.



(Left) Early Stage Partners' portfolio includes companies like Simbionix, an emerging leader in computer-assisted surgical simulation.

(Right) Spectacular Severance Hall is one of the world's most beautiful concert halls and home to The Cleveland Orchestra.

The State of Perfect Balance

Jamie Ireland's successful investment career had taken him from Wall Street to Seattle. But he didn't have real balance in his life until he moved to Ohio fourteen years ago. Professionally, Jamie co-founded Early Stage Partners in 2002, a growing Northeast Ohio venture capital firm specializing in life sciences, technology, materials and advanced manufacturing. He was also instrumental in creating the Ohio Venture Capital Fund to raise millions in private investment capital for companies in the seed or early stage of business development.

Away from work, Jamie enjoys the opportunity to get involved at a high level in the arts community he's passionate about. As president of The Cleveland Orchestra Board and chairman of University Circle Inc. – an association of key cultural, medical and educational institutions – Jamie can personally make a difference. Because events are both easier to get to and more affordable due to Ohio's reasonable cost of living, Jamie finds that Cleveland's world-class cultural institutions are more accessible to everyone, resulting in a very healthy arts environment.

In Ohio, Jamie has taken a leadership role in both his career and his personal life, without sacrificing one for the other. The balance is perfect.

"In Ohio, there's balance *and* opportunity. It allows me to achieve more in all aspects of my life."

James D. Ireland III
Founding Partner
Early Stage Partners

Ted Strickland, Governor
Lee Fisher, Lt. Governor

Ohio
The State of Perfect Balance

Find your balance at OhioMeansBusiness.com.

For direct help, contact Matt McQuade at (614) 857-0900 ext. 231 or mmcquade@ohiomeansbusiness.com

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