BY ALEX ROBINSON AND TAREN GROM

Cluster IMPACT

Biotech centers of excellence are popping up around the country.

BIO 2002 held in Toronto in June, drew exhibitors from 28 countries and 47 U.S. states many of whom were in attendance to unveil their region's assets as biotechnology centers of excellence.

The message being delivered was biotech "cluster." State and city officials were eager to reach out to the 15,000 plus attendees from 52 countries. There was plenty for attendees to learn with a record number of biotech regions attending the conference. Bottom-line numbers help explain why. Bioscience revenue grew to $25.7 billion in 2000 from $8 billion in 1993, while market capitalization grew to $350.2 billion in 2000 from $137 billion in 1999, according to data from Walter Plosila, Ph.D., VP, public technology management at Battelle Memorial Institute.

But numbers don't tell the whole the story, says Dr. Plosila, who notes that the terms bioscience and cluster go together. Bioscience, he says, refers to a gamut of life-science enterprises: companies, research organizations, hospitals, academic health centers.

A cluster is a wide range of interrelated establishments drawn to a geographical area by, in this instance, the collaboration and connectivity that drive bioscience.

"In the bioscience industry, a cluster is either what an area has or what it's trying to develop," he says.

Dr. Plosila says a cluster can be developed on an existing base, for example, the 5,000 people who work in the medical-device industry in Pittsburgh, or from a strong base in organic chemicals, such as the one that Georgia boasts, or it can be built on a higher education core competency.

"Whatever the model, clusters do not suddenly appear," he says. "They develop. At some point in time, they are emerging. At some point in time, they become mature. There are a range of factors that contribute to building a cluster. Regions need to survey where they stand on these factors and what needs to be done to address these factors."

Cluster Ingredients

First and foremost, a cluster needs an anchor: research organizations or institutes of higher education. It helps if this anchor has a clear focus on the research the region does well. And because research is non-linear, Dr. Plosila says, "Industry needs to be involved from the start in developing, defining the problems, and defining the issues to be addressed in the research agenda — the research leads to market pull not technology push."

A cluster requires an entrepreneurial mindset, with networking, collaboration, and technology transfer mechanisms.

A vision, a set of strategies for the long haul and local champions also are important elements to success.

In addition, a cluster needs an infusion, or access, to capital. "Without the ability to do the early-stage deals — $200,000 to $2 million — a cluster won't be able to commercialize its research," Dr. Plosila says. "Discretionary federal money and institutes have helped some successful regions."

According to Dr. Plosila, it helps if tax and business regulations are attuned to the bioscience industry, although most state and local codes are not as up to date as they should be.

"Tax benefits don't necessarily reflect the growth going forward," he says. "Regions and states have been adjusting these, but they still need some tweaking in some cases."

A talented workforce pool is another necessity for successful clusters, as are specialized facilities, including incubators, accelerators, test beds, and pilot plants.

Last, but not least, Dr. Plosila says clusters require a patient, long-term perspective. He cites Maryland as an example of a region that was able to develop a bioscience cluster in record time, 12 years to 14 years. But it can take up to 20 years to develop a fully mature cluster.

PharmaVOICE has taken snapshots of the strategies and the work under way to develop or maintain bioscience clusters in several U.S. centers.

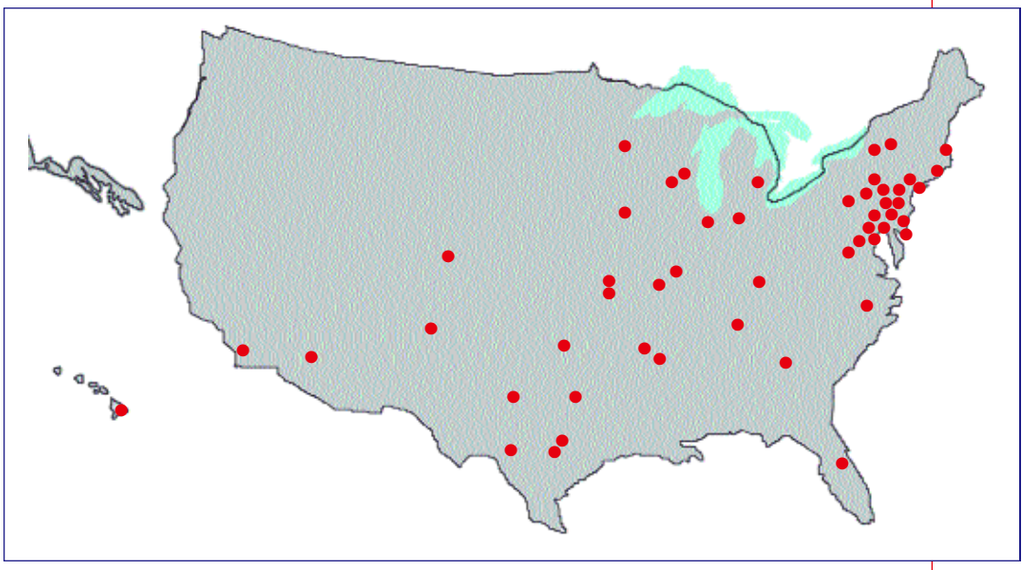
NECESSARY ELEMENTS TO BUILD A BIOTECH CLUSTER OF EXCELLENCE

- Cutting-edge research
- Access to capital
- Government leveraged investment
- Strong educational institutions
- Entrepreneurial culture and support network
- Presence of vibrant industry clusters
- Experienced professional service providers
- A catalyzing organization in the life sciences
- High quality of life

Emerging Biotech Clusters

LOCATION
Website

ARIZONA BIOINDUSTRY CLUSTER — www.azbiocluster.org
ARKANSAS BIOVENTURES — www.arkansas-bioventures.uams.edu/
ARKANSAS DEPT. OF ECONOMIC DEVELOPMENT — www.aedc.state.ar.us/
BIO FORT WORTH — www.biotechfortworth.org
BIOBELT ST. LOUIS — www.biobelt.org
BIOCOM/SAN DIEGO — www.biocom.org
BIOFLORIDA — www.bioflorida.com
BIOKENTUCKY — www.biokentucky.org
BIOTECHNOLOGY GREENHOUSE CORPORATION OF SOUTHEASTERN PENNSYLVANIA — www.pabiotech.org/GreenHouse/EasternPA.html
BIOTEXAS — www.txed.state.tx.us
BUFFALO NIAGRA ENTERPRISE — www.buffaloniagara.org
BUFFALO NIAGRA LIFE SCIENCES INC. — www.buffaloniagara.org
COLORADO BIOTECHNOLOGY ASSOCIATION — www.colobio.com
CONNECTICUT INNOVATIONS INC. — www.ctinnovations.com
CURE CONNECTICUT'S BIOSCIENCE CLUSTER — www.curenet.org
DESTINATION IRVINE — www.destinationirvine.com
EMPIRE STATE DEVELOPMENT CORPORATION — www.nylovesbiz.com
FAIRFAX COUNTY ECONOMIC DEVELOPMENT AUTHORITY — www.fceda.org
FORWARD WISCONSIN — www.ForwardWI.com
FREDERICK COUNTY OFFICE OF ECONOMIC DEVELOPMENT — www.discoverfrederickmd.com
GEORGIA LIFE SCIENCES — www.gabio.org
GREATER AUSTIN CHAMBER OF COMMERCE — www.austinchamber.org
GREATER ROCKVILLE PARTNERSHIP — www.greaterrockville.org
HAWAII BIODIVERSITY/HAWAII BIOTECH COUNCIL — no website
INNOVATION PHILADELPHIA — www.lpphila.com
IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT — www.iowasmart.com
KANSAS CITY AREA DEVELOPMENT COUNCIL — www.smartkc.com
KANSAS CITY AREA LIFE SCIENCES INSTITUTE INC. — www.kclifesciences.org
LIFE SCIENCES GREENHOUSE OF CENTRAL PENNSYLVANIA — www.lsg-centralpa.org



MASSACHUSETTS WORKS! — www.massbio.org
MICHIGAN BIOSCIENCES INDUSTRY ASSOCIATION (MICHBIO) — www.MichBio.org
MICHIGAN LIFE SCIENCES CORRIDOR — www.michigan.org
MINNESOTA BIOTECHNOLOGY — www.positivelyminnesota.com
MISSOURI DEPARTMENT OF ECONOMIC DEVELOPMENT — www.missouridevelopment.org
MONTGOMERY COUNTY, MARYLAND DEPARTMENT OF ECONOMIC DEVELOPMENT — www.co.mo.md.us/busdev
NEW MEXICO ECONOMIC DEVELOPMENT — NewMexicoDevelopment.com
NEW YORK ECONOMIC DEVELOPMENT CORP. — www.newyorkbiz.com
NORTH CAROLINA BIOTECHNOLOGY CENTER — www.ncbiotech.org
OKLAHOMA BIOSCIENCE CLUSTER — no website
PENNSYLVANIA BIOTECHNOLOGY ASSOCIATION — www.pabiotech.org
PENNSYLVANIA LIFE SCIENCES GREENHOUSE — www.inventpa.com
PITTSBURGH LIFE SCIENCE GREENHOUSE — www.pittsburghlifesciences.com
ROANOKE AND NEW RIVER VALLEY ECONOMIC DEVELOPMENT — www.roanoke.org
SAN ANTONIO — no website
SOUTHWEST MICHIGAN FIRST — www.southwestmichiganfirst.com
STATE OF DELAWARE — www.delaware.gov
STATE OF ILLINOIS - DCCA — www.commerce.state.il.us/
STATE OF INDIANA/INDIANA DEPARTMENT OF COMMERCE — www.indianacommerce.com
STATE OF TENNESSEE — www.soundsgood.org
TEAM PENNSYLVANIA WEST — no website
THE MARYLAND TECHNOLOGY DEVELOPMENT CENTER — no website
VIRGINIA ECONOMIC DEVELOPMENT PARTNERSHIP — www.yesvirginia.org

Source: Biotechnology Industry Association, BIO 2002 Annual Convention Program. Note: This chart contains economic development, life-science cluster initiatives, and state-run development agencies, and is not meant to be inclusive of U.S. biotech economic development initiatives.

PENNSYLVANIA — A Greenhouse Effect

One of the biggest initiatives unveiled at BIO 2002 was Pennsylvania's three Life Sciences Greenhouses, which are spread among three regions of the state: Southeast, Southwest, and Central Pennsylvania.

"Our goal is nothing less than to lead the revolution in healthcare that breakthroughs in biotechnology will make possible, and to ensure that those quality-of-life and economic opportunities reach all Pennsylvanians," Governor Mark Schweiker says.

To achieve that goal, Pennsylvania is investing $2 billion of its estimated $11.3 billion tobacco settlement on health and life-sciences initiatives for venture funding.

"Pennsylvania is the only state in the country to use every penny of the proceeds from the tobacco settlement for healthy living and nurturing the life sciences," Gov. Schweiker says. "No other state can make that claim. We're also the only state that is setting up a $60 million venture-capital fund to endow the research of these life-saving and life-enhancing applications."

The $60 million venture-capital fund to be used by start-up companies is expected to leverage an additional $150 million to $200 million in funding. These monies will help ensure that entrepreneurs have the resources to expand their companies in the state.

The $2 billion investment includes $1.6 billion — $64 million a year for 25 years — to keep the state's research at the cutting edge, spur commercialization, train researchers in starting new companies, and develop educational partnerships with colleges.

The investment provides $100 million for Life Sciences Greenhouses in Pittsburgh, Hershey, and Philadelphia that will leverage an additional $100 million in local funding. The Life Science Greenhouses will: provide services to expand and attract life-sciences companies, seed funding to develop ideas into products, and develop business and worker training.

"Our plan is integrated and far-reaching," Gov. Schweiker told PharmaVOICE. "It provides support for our best and brightest researchers to pursue their dreams and will help spark those dreams to become products and companies."

The plan builds on a solid base. Pennsylvania is home to more than 1,500 life-science related companies, including 413 research and development companies, 454 testing labs, 285 research organizations, and 83 pharmaceutical companies. Pennsylvania ranks second in the U.S. in pharmaceutical employment and third in biotechnology employment. Its life-science companies employ more than 66,000 people. In 2001, Pennsylvania received $1.1 billion in NIH funding for biomedical research, and the University of Pittsburgh led the nation in NIH funding for bioengineering projects.

Gov. Schweiker believes businesses are attracted by a nurturing environment where venture capital is avail-

GOV. MARK SCHWEIKER

Our goal is nothing less than to lead the revolution in healthcare that breakthroughs in biotechnology will make possible

able, by a wealth of well-trained personnel, and support for the rapid commercialization of promising concepts.

"I think we have hit the mark on all three," he says. "The greenhouses will be successful only if a couple of things happen. There has to be job growth and company success. But in the field testing of these applications, we have to involve our community hospitals, and not just the big urban center institutions but the teaching hospitals. There has to be sharing and developing of the intellectual wealth."

Gov. Schweiker is passionate about developing that intellectual capital. "We are going to adjust the curriculum across Pennsylvania so that children know that there are rewarding career tracks in life sciences," he says.

INDIANA — In the Race

Indiana expects to be known for more than the Indianapolis 500 soon. Central Indiana announced its bid to become a world-class center for the life-sciences industry this past February when it unveiled the Central Indiana Life Sciences Initiative.

JEB CONRAD

The time is right for a biotechnology and life-sciences initiative because we have the right partners in place.

The initiative includes leaders from Indiana's top research, academic, and economic development organizations. Its core goals are to leverage investment capital for life-sciences projects, retain and attract a skilled life-sciences workforce, market the region as a world-class health and life-sciences hub, and develop successful collaborations, including a downtown research facility.

The initiative will build on $1.5 billion invested or committed to business, research, laboratory, transportation, facility, manufacturing, and venture-capital projects through 2005. A committee plans to raise an added $100 million to seed and channel venture funding.

KARL QUEISSER

The life-sciences industry is Indiana's largest private employer, providing more than 82,000 jobs.

The initiative is being spearheaded by a core group, including Mayor Peterson; Central Indiana Corporate Partnership President David Goodrigh; Eli Lilly & Co. Chairman, President, and CEO Sidney Taurel; Indiana University President Myles Brand; and Purdue University President Martin Jischke.

"The time is right for a biotechnology and life-sciences initiative because we have the right partners in place," says Jeb Conrad, VP of Marion County Economic Development. "We have the necessary assets in our community from which we can nurture this initiative — Lilly, Roche Diagnostics, Dow Agro Sciences, and the IU Medical Center. Working with Indiana University and Purdue University, we will be better able to capture the talent graduating from these institutions, and also the research that is initiated out of these universities."

Karl Queisser, director of client services of The Indy Partnership, an initiative partner, adds: "Life sciences has been part of our culture for quite some time, but not in a concentrated and cohesive fashion. Community assets to nurture the initiative are in place, including pharmaceutical companies, and medical and research centers."

The life-sciences industry is Indiana's largest private employer, providing more than 82,000 jobs. Indiana ranks second in the U.S. in surgical appliances and sales, fifth in pharmaceutical sales, and ninth in surgical and medical instrument sales and employees.

MISSOURI — A Tale of Two Cities

Gov. Schweiker was not the only top-level state representative to attend BIO 2002. Missouri Governor Bob Holden also was in attendance, touting his state's attributes as a biotech region of excellence. According to Gov. Holden, the state has identified four strategies to position Missouri as a major life-sciences state: boosting research capacity by investing in people and facilities; building a culture of entrepreneurship, providing life-science firms with better access to capital resources and a more responsive state government; ensuring a favorable business climate; and linking the state's education workforce system with the talent needs of firms and researchers.

GOV. BOB HOLDEN

Governor Holden says his ambition for Missouri is to become a key life-science cluster in the U.S. and the world.

"We want to spin off and create new firms from our research enterprise, keep and expand our existing base, and attract new firms to our state," says Gov. Holden, whose goal is for Missouri to become "a key life-science cluster in the U.S. and the world."

This four-point strategy appears to be paying off. Missouri's life-sciences employment is 14% higher than the national concentration. The biosciences sector grew 11% in 2001, against a national average of 7.3%, with $42 million in venture capital going to Missouri companies in 2001.

Large plant and research centers have opened in St. Louis and Kansas City in the past two years, and funds entering the state have strengthened its bioscience base.

"Missouri communities are taking various approaches as they build biotech clusters," says Richard Fleming, president and CEO of the St. Louis Regional Chamber and Growth Association. "We wanted to be the BioBelt and that has become our brand, the center of plant and life sciences."

St. Louis has begun building an entrepreneurial culture that nurtures young plant and life-sciences companies through a virtual commercialization center involving a seed fund. Mr. Fleming notes this is the glue that connects the technology transfer and commercialization process of St. Louis' research universities to the marketplace.

The region also has begun to develop a local venture-capital base. In 24 months, this effort yielded four venture funds that closed with an aggregate $282 million. In the next six to eight months, two more funds will be added with an anticipated closing of $250 million.

In another part of the state, Kansas City (Mo.) is making its mark as a biotech cluster. Home of the Stowers Institute for Medical Research, a $200 million, 600,000-square-foot genetic research facility supported by a $1.6 billion endowment, the city has a research anchor of eight large research organizations that, together, are undergoing a $1 billion expansion.

This research anchor plus pharmaceutical company research and investment, the willingness of the scientific community to collaborate and the region's support for bioscience start-ups and relocated companies are among Kansas City's reasons for believing that now is the right time to develop a bioscience cluster.

"There is some concern that Kansas City is behind the curve in terms of timing," says William Duncan, Ph.D., president of the Kansas City Area Life Sciences Institute Inc. "But the pie is very large and the general feeling is that Kansas City is in the game."

"Kansas City metro has doubled basic research funding over the last two years," says Martin Mini, senior VP of marketing communication at the Kansas City Area Development Council. "But what truly distinguishes the region from other bio-centers of excellence is the profitable operating environment. Along with our rapidly developing base of research come all of the attributes traditional businesses find so important — moderate costs, quality workforce, low taxes, superb infrastructure, and incentives for growing tech-based firms."

Today, the Kansas City area's 800 bioscience companies employ about 6% of the city's workforce. Research funding doubled between 1999 and 2001 and now stands at more than $190 million.

Kansas City's premier goal, Dr. Duncan says, is to be recognized as one of the top 10 regions nationally for life-sciences research.

Steve Lufkin, general manager at Midwest Research Institute, says, "Our intent is not to be the biggest, but the most efficient and effective. We're not ever going to be as big as Boston or San Diego, but we have the opportunity to be as good as the major life-sciences centers in the country."

TENNESSEE — For Technology

TONY GRANDE

Tennessee is working aggressively to harness and transform our world-class life-science research and development centers into economic development engines.

Tennessee's claim as the "Center of the South" is behind its move to become a biotech region. Tennessee's biotech resources form a network spanning the state from Vanderbilt University Medical Center's science and research expertise to overnight delivery powerhouse FedEx, to the University of Tennessee Health Sciences Center and St. Jude Children's Research Center in Memphis to the Oak Ridge National Laboratory in East Tennessee.

"The global economy is becoming increasingly dependent on technology-based industry, and Tennessee is working aggressively to harness and transform our world-class life-science research and development centers into economic development engines," says Tony Grande, commissioner of the Tennessee Department of Economic and Community Development.

BUFFALO NIAGARA — Bioinformatics

The Buffalo Niagara region, with a rich history of life-sciences discoveries and research activities, is at a critical turning point. Over the next three years, more than $560 million will be invested in significant life-sciences projects. According to Angelo Fatta, Ph.D., president of BuffLink Inc., these projects will build upon the life-sciences assets that the region already possesses to cultivate a thriving life-sciences economy.

"The region has realized that the opportunity to expand its life-sciences economy is real, and that the investments taking place are real," Dr. Fatta says. "Therefore, the public, private, and university sectors are for the first time aligned to support an initiative in the life sciences. A regional strategic plan that brings the region's assets together has been developed by the community, and over the next several years, the strategies will be implemented.

"While there is certainly a recognition that our region and other regions are in a race for investment, companies, and talent, we also realize that this industry is fairly specialized, and that different regions will have more strengths than others," Dr. Fatta says. "Our strategy is to play to our strengths and enhance the competitive advantages in areas where we already excel. Therefore, in many areas, we are already ahead of other regions that are just starting out or trying to catch up since many of our assets have been in place for years."

During the fall of 2001, BuffLink, a non-profit organization aimed at catalyzing growth in the life sciences, began work on a regional life-sciences strategy and implementation plan.

"All of the essential ingredients to build a thriving life-sciences economy already exist in Buffalo Niagara," Dr. Fatta says. "What had been missing is a cohesive, clear 'game plan' to link these assets or focus them on positioning the region as a globally recognized player in the life sciences."

OKLAHOMA CITY — O.K. for Biotech

Oklahoma City came to BIO 2002 to "co-promote the state and its technology," says Catherine Doray, director of biotechnology development and marketing at the Greater Oklahoma City Chamber of Commerce. "We promote the state as a low-cost speed-to-market location for life-science manufacturing and we promote the value of our technology to investment partners."

Oklahoma City's goal is to develop recognition for the Oklahoma Bioscience Industry Cluster, currently about 60 companies, while creating high-quality jobs in Oklahoma City.

Behind the media campaign stands Forward Oklahoma City II, a $12.8 million, five-year economic development program funded by more than 200 companies and operated by the Chamber of Commerce. "Begun in 2001, the program is a major initiative to leverage investment in infrastructure and expand outreach," Ms. Doray says. ✦

PharmaVoice welcomes comments about this article. E-mail us at feedback@pharmalinx.com.

Experts on this topic

JEB CONRAD. VP, Marion County Economic Development, Indianapolis; Marion County has teamed up with the Indy Partnership to strengthen the economic growth of the central Indiana region

CATHERINE DORAY, MIM, RAC. Director, biotechnology development and marketing, Greater Oklahoma City Chamber of Commerce, Oklahoma City; the organization is spearheading Forward Oklahoma City II, a five-year economic development program

WILLIAM DUNCAN, PH.D. President, Kansas City Area Life Sciences Institute Inc., Kansas City, Mo.; KCALSI is helping transform the area into a center for excellence in life-sciences R&D

ANGELO FATTA, PH.D. President, BuffLink, Inc., Buffalo, N.Y.; BuffLink's mission is to accelerate the technology transfer process and increase the commercialization of locally generated cutting-edge research

RICHARD FLEMING. President and CEO, St. Louis Regional Chamber and Growth Association, St. Louis; the RCGA is the economic development organization for the bi-state St. Louis region

TONY GRANDE. Commissioner, Tennessee Department of Economic and Community Development, Nashville; the department's mission is to encourage economic growth

GOVERNOR BOB HOLDEN. State of Missouri; Mr. Holden took office Jan. 8, 2001, as Missouri's 53rd governor

STEVE LUFKIN. General manager, Midwest Research Institute, Kansas City, Mo.; MRI is helping transform Kansas City into a center for excellence in life-sciences research and development

MARTIN MINI. Senior VP, marketing communications, Kansas City Area Development Council, Kansas City, Mo.; KCADC is the metro area's umbrella economic development organization

WALTER PLOSILA, PH.D. VP, public technology management, Battelle Memorial Institute, Columbus, Ohio; Battelle serves industry and government in developing new technologies and products

KARL QUEISSER. Director client services, The Indy Partnership, Indianapolis; the Indy Partnership is dedicated to strengthening the economic growth of the central Indiana region

GOVERNOR MARK SCHWEIKER. State of Pennsylvania; Mr. Schweiker was sworn in Oct. 5, 2001, as Pennsylvania's 44th governor