Where Life Sciences Meet Life

It's not a question of whether or not some discovery in life sciences will affect the quality of life for you or your family. It's a matter of how soon. And Kansas City just may be the place it will happen.

By Michael Johnson
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No doubt you are aware that some of the most eagerly anticipated advancements in health care are expected to come from the field of life sciences. A google.com search gives you 10.7 million articles to look through. But what if you had to explain how life sciences could affect your life … and how Kansas City is contributing? What *would* you say?

"With one of the best collaborative research environments in the nation, our metro is completely capable of sourcing discoveries that lead to new companies and new treatments for disease," says Bob Marcusse, president and CEO of the Kansas City Area Development Council. "That's good for everyone and good for KC."


Marcusse

You can thank the Kansas City Area Life Sciences Institute (KCALSI) for adding the term "life sciences" to your vocabulary.

In 1999, eight institutions came together as the Kansas City Area Life Sciences Institute. The goal was to develop the area's life sciences research capacity, resulting in a top-tier ranking in the broad areas of life sciences research.

After five years, all original partners remain: UMKC, Stowers Institute for Medical Research, the Midwest Research Institute, Saint Luke's Hospital, Children's Mercy Hospital, University of Kansas Medical Center, the University of Kansas and the Kansas City University of Medicine and Biosciences (formerly the University of Health Sciences).

Also remaining strong is support from community leaders and those who oversee research activities at member institutions.

In 2004, the Civic Council of Kansas City extended financing of the KCALSI with a $1 million influx of funds over five years. The council pointed to KCALSI's success-to-date in collaboration among the partners. Last summer, for example, KCALSI President William P. Duncan noted that the partners had doubled research expenditures and had identified or acquired $11.3 million in federal funds for laboratory equipment


Duncan

The promise by the National Institutes of Health, one of the nation's leading grant providers, for more funding to turn basic research findings into actual products for the marketplace makes the outlook for continued competitive federal funds good.

Last November, T. Nelson Mann, chairman of the Greater Kansas City Chamber of Commerce, said a chamber priority was to encourage bioscience research and development in the metro area.

So, with strategic progress being made, how much of a contributor is UMKC?

Institutionally, UMKC established leadership in the life and health sciences as one of its campus goals, says Mary Lou Hines, UMKC chief information officer and vice provost for academic programs.

"That goal recognizes and supports the efforts of outstanding faculty in receiving grants and contracts to support their research," Hines says.

From 1999 to 2004, the amount of life sciences grants and contracts to UMKC increased to $22.5 million from $14.5 million. Within the same five-year time frame, federal funds to UMKC totaled $5.89 million, supporting equipment and materials for the life sciences research lab.

In addition to the research component, UMKC serves as a very active participant in training the technically competent workforce required in the life and health sciences industries.

UMKC Provost and Vice Chancellor of Academic Affairs William Osborne notes that UMKC's contribution to workforce development stems from UMKC's rare combination of four health sciences schools, overall strength in delivering patient care, and its partnerships with area clinical hospitals.

While acknowledging that life sciences is the most commonly used descriptive phrase, Osborne prefers the term health sciences as the better definition of UMKC efforts.

"Health sciences affect you, your life, your family," he says. "We are more focused on clinical care and clinical research, which involves studies with patients and identifying and implementing practical applications."

And Osborne certainly knows this: for life sciences research to have meaning and relevance among the public, it must be distilled into human impact.

As evidence, Osborne is quick to point out the work of School of Nursing faculty member Tina Hines and her research looking at the effects of high blood pressure during pregnancy, School of Pharmacy's Ashim Mitra's

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research into the promise of improved drug delivery to the eye, School of Dentistry's Lynda Bonewald and her work in combating diseases of the bone and teeth, and the School of Medicine's new Shock/Trauma Center, to highlight just a few.

"As exciting as existing life sciences research is, the future is even brighter," Osborne says. "Our program in informatic medicine will be a milestone for UMKC and Kansas City, making contributions in medical education and in medical research."

Think of informatic medicine this way: doctors and nurses making patient-care decisions via access to a wide range of existing knowledge – research results, patient studies, drug therapy results, etc. That data can be linked to the specific genomic data of individual patients.

Today, the medical technology to achieve real-time, bedside access to such information doesn't yet exist. But it is part of the bright future Osborne and others see in Kansas City.

Betty Drees, dean of the School of Medicine, says the school is "perfectly positioned to develop interdisciplinary programs that train future physicians and their teams to practice in the informatic age."

Soon a Center for Informatic Medicine at the Medical School will provide increased computing facilities for use in biological and health-based problems. Drees envisions staffing it with faculty of diverse medical backgrounds who can solve problems collaboratively.

In addition, the University's new Health Sciences Building, which broke ground last October, will provide an expansion home

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– UMKC Provost William Osborne

for researchers and scholars from the Nursing and Pharmacy schools. The next facility for the Hospital Hill campus is the Center for Health Sciences Research, which will provide additional research lab space, especially in the emerging informatic medicine and patient-care technologies fields. The facility's laboratories also will be available to enhance the work being done by KCALSI.

Bioinformatics, which involves using computers to analyze databases integral to biological research, also is a UMKC focus. The School of Biological Sciences, for example, is using advances in bioinformatics

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to research the structure and function of bacterial toxins. Understand the processes used there, researchers say, and that knowledge reveals paths that can eventually lead to new medical treatments.

And since 2003, students may add a bioinformatics emphasis to a bachelor's degree in biology (through the School of Biological Sciences) and to the bachelor's degree in computer science (through the School of Computing and Engineering).

Such progress, of course, doesn't guarantee long-term success as a major player in the life sciences arena. That ultimately comes down to having the right mix of components. Without a full complement of entities working together, any region's efforts could stall.

While Kansas City has made progress in the life sciences, it is not the only one catching the life sciences wave. In addition to the long-established San Diego and Birmingham, Ala., regions, more are gearing up, including those in Maryland, North Carolina, Pittsburgh, Columbus, Ohio, and Michigan.

"I think 46 states and some 100 cities are catching on to the next wave," says UMKC's Osborne. "But Kansas City is getting a lot of play. It's among the top 15 life sciences regions in the U.S."

Richard Seline, founder of New Economy Strategies, a Washington, D.C., firm that studies new strategic initiatives, says the Kansas City region has the experience and resources to affect emerging health-care delivery systems and make advances in needed information technology. Stowers Institute has a $1.7 billion endowment and has plans to expand every year over the next 8-10 years. He says Kansas City is a place where state agencies and employers work together well.

"I'm extremely optimistic about where Greater Kansas City can be," Seline told *The Kansas City Business Journal* last June at the 2004 annual dinner of the Kansas City Area Life Sciences Institute.

Zimmer

Meanwhile, Kansas City's corporate community continues to embrace the life sciences vision for Kansas City. Developer Hugh Zimmer, CEO of Zimmer Companies, had outlined his support of a research and business park, to be located north of UMKC's Hospital Hill campus.

If realized, supporters say, the park will provide a place for life sciences start-up businesses and assist Kansas City in rebuilding its urban core.

Beyond the very real aspects of improving community health lies another expectation in the commitment to life sciences: a powerful economic engine with economic impact lasting well into the future.

The Battelle Institute Inc., a national consulting firm, notes the life sciences industry crosses sectors of the economy like few others do. Life sciences, the institute says, is a natural focal point for converging technologies. U.S. Dept. of Commerce statistics state that 41 jobs are supported or created in a community for every $1 million dedicated to life sciences research.

By 2010, the U.S. Federal Reserve estimates biotechnology-life sciences may comprise 18-22 percent of the gross domestic product. In fact, a Milken Institute study of economic growth stated 65 percent of the difference in economic success among regions across the country is due to the presence of high-tech industries.

"Locally, research in life sciences among our eight key stakeholder institutions has grown from $100 million to $250 million, halfway to the region's goal of $500 million," KCALSI's Bill Duncan says.

As much support as there is for Kansas City to emerge as a life and health sciences leader, it's how "life sciences" is perceived by the non-scientific community that is essential for widespread acceptance.

Simply put, residents have to see the link between research work and practical applications – new treatments, new medicines, new approaches to old health care problems.

At the Medical School's Shock/Trauma Center, for example, researchers are taking on a familiar enemy: death due to shock caused by traumatic injury. Its research in treatments resulted in the center receiving $2.1 million in funding from the 2005 U.S. defense budget.

Director of the UMKC Shock/Trauma Center Charles Van Way, III, M.D., also a professor and chair of surgery at the School of Medicine and Truman Medical Centers, says additional funds will help prove in clinical studies what research already indicates.

"We plan to establish translational research studies of trauma patients using a collaborative effort," Van Way says.

Translational research – taking discoveries out of the lab and into life – is the exciting part of the work being done by scholar-researchers like Tina Hines, Lynda Bonewald, Ashim Mitra and David Eick. Eick's research toward inventing better dental adhesives is now in the marketplace, and Mitra's discoveries are in the testing phase.

No one knows the potential payoff better than Provost Osborne.

"Ashim Mitra is talking about drug delivery to the eye, changing medicine that now is prescribed daily to a treatment that is effective for a month at a time," Osborne says. "That's progress. That's a benefit in real life. That's health and life sciences at UMKC."

To learn more about life sciences work at UMKC and by KCALSI partners, go to the following Web sites:

http://lifesciences.umkc.edu

www.kclifesciences.org

www.battelle.org *or go to*

www.umkc.edu *and enter "life sciences" in the keyword search.*