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A GUIDE TO

LIFE SCIENCES IN GREATER KANSAS CITY

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A nonprofit organization, funded by the Ewing Marion Kauffman Foundation and the Missouri Department of Economic Development, that works to accelerate the formation and growth of life sciences and technology-focused businesses and jobs in the greater Kansas City bi-state region. KCCatalyst achieves its mission by providing high-growth entrepreneurs strategic guidance, programs, and other business development services centered on three major initiatives – collaboration, commercialization, and capital formation. Through these activities, KCCatalyst helps life sciences and technology-focused entrepreneurs build successful companies.

www.kccatalyst.com

KANSAS CITY AREA LIFE SCIENCES INSTITUTE (KCALSI)

A non-profit organization assisting with the transformation of Kansas City into a center for excellence in life sciences research and development. The KCALSI and its stakeholder institutions share an ambitious goal – to make new discoveries in aging and related diseases, neuro-degenerative and cardiovascular diseases, cancer and infectious diseases and, in the process, achieve top ten status on the list of regionally funded organizations in the life sciences.

www.kclifesciences.org

GREATER KANSAS CITY CHAMBER OF COMMERCE

The Greater Kansas City Chamber of Commerce is dedicated to providing responsive and committed leadership that builds a vibrant and thriving community as we seek to achieve prosperity and an outstanding quality of life. We will assist our members in growing their businesses by creating a community where members are connected to one another in the local, regional, and global marketplace.

www.kcchamber.com

KANSAS CITY AREA DEVELOPMENT COUNCIL (KCADC)

A private, non-profit organization that attracts job-creating investment to the 18-county, bi-state Kansas City Area. Since its inception in 1976, KCADC and its partners have directly assisted more than 500 companies and organizations in selecting the Kansas City Area as a site for new and expanding facilities.

www.smartkc.com

KANSAS TECHNOLOGY ENTERPRISE CORPORATION (KTEC)

The Kansas Technology Enterprise Corporation is a state-chartered corporation dedicated to stimulating technology-based economic development in Kansas. KTEC's goal is to help commercialize technology and, in turn, create high-paying jobs for Kansans and diversify the Kansas tax base.

www.ktec.com

"The 21st century portends the Biotechnology Century, driven by an increasingly powerful array of enabling technologies that are causing rapid advances in traditional life sciences. These technologies, together with advances in genomics, have led to an explosion of biological information that has transformed drug discovery and development – and moves us closer to the 'Holy Grail' of healthcare: individualized, customized medicine."

Steven G. Burrill
The Biotechnology Industry Annual Report

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PART ONE

INTRODUCTION

Even if you loosely follow what is happening in greater Kansas City's bi-state region today, it is hard to miss hearing the term "life sciences." This region is gaining a national reputation as one of the nation's fastest-growing centers for life sciences research.

At first glance, that may be hard to believe, particularly when Kansas City is mentioned in the same breath as traditional life sciences centers of excellence such as Boston, San Diego, Philadelphia, or Silicon Valley. Kansas City, in fact, deserves to be referred to as one of the up-and-coming centers of life sciences research.

More than many cities, greater Kansas City features a regional economy of great diversity – spanning technology, telecommunications, manufacturing, agriculture, engineering, and a rubust services sector. This economic diversity enables life sciences research and commercialization to thrive in Kansas City.

This report serves as a basic primer on the nature of the life sciences industry today and the potential role it can play in the economy of the greater Kansas City bi-state region. While there are many cities across the country that boast strong life sciences sectors, Kansas City has the opportunity to differentiate itself and enjoy a significant economic contribution from the bio-economy through its unique blend of business, academic, scientific and entrepreneurial assets.

We must acknowledge, however, that we are not alone. Our community is engaged in a race to see which regions will emerge as global leaders in the life sciences and to determine which metropolitan areas receive the greatest economic benefit from the new businesses and jobs created by the emerging bio-economy boom. It is a race fueled by innovation, research, talent, and money.

The stakes are high. According to *The Wall Street Journal*, the U.S. Federal Reserve, and other economic forecasters, 15-18 percent of the U.S. Gross Domestic Product will be comprised of health care and life science activities over the next two decades. The competition between communities and regions for the billions of dollars in revenue, investment dollars, and jobs that are expected to be created over the next five years in the bio-economy will be fierce.

At stake for Kansas City's bi-state community is simply whether our region will participate in the life sciences revolution. Further, will this region be viewed in the same light as other top tier cities or will Kansas City be thought of as a second tier city? We are in a race for our socio-economic future.

The greater Kansas City region has chosen to compete by investing billions of dollars in collaborative life sciences research to help win the race. This is a good start and places the region ahead of many others. Research alone, however, will not provide the economic return we all seek. We must also create an equally renowned commercialization, risk capital, and work force infrastructure. We may someday soon have Nobel Laureate discoveries in our very community. But the painful reality is that if we build and support a world-class research infrastructure without an equal focus on the infrastructure necessary to turn those new ideas into new jobs and new companies, then those noble research efforts will only work to the economic benefit of other communities where they will go to be commercialized.

LIFE SCIENCES – WHAT IS IT?

What exactly are the life sciences? In simplest terms, life sciences relates to the study of human, plant, and animal microbial physiology, biology, and chemistry. The U.S. government views life science as any scientific technique that employs living organisms, or parts of living organisms, to manufacture new products. The Biotechnology Industry Organization (BIO), the leading life sciences industry association, notes life sciences involve "the use of cellular and molecular processes to solve problems or make products."

For our purposes, life sciences denotes a wide range of research that allows scientists to isolate and closely observe human, plant, or animal life at its most basic form – the molecular and cellular level. The commercial output of this research may create the means to alleviate and eventually cure many of the basic natural defects found in the cell structures of all living organisms, and thus vastly improve health care, agriculture, the environment, and even our nation's security.

INDUSTRY BACKGROUND

The era of life sciences research and commercialization began barely over twenty years ago when the U.S. Food and Drug Administration approved a new drug developed by Genentech and Eli Lilly to treat diabetes. The drug, known as recombinant human insulin, was the first biotechnology-produced drug to win federal approval for medicinal use.

The greater Kansas City region has chosen to compete by investing billions of dollars in collaborative life sciences research to help win the race.

According to BIO, there are currently over 1,450 life science-related firms with more than 179,000 employees making up the bio-economy in the United States. The industry is characterized as research intensive, spending an average of $121,000 per employee in R&D and employing workers at an average wage approximately 85 percent higher than other employment sectors. Similar to the medical device industry, the life sciences industry is dominated by small firms with the median life sciences firm having 31 employees, annual revenues of $4.5 million, and is highly dependent on innovation for fund-raising. Over the last decade, the life sciences industry has tripled in size with overall revenues reaching $22 billion in 2000 – up from $8 billion in 1993. In addition, BIO estimates that an additional $27 billion in indirect economic impact can be attributed to the life sciences.

While the economic benefits warrant pursuit of this industry sector, the human factor must also be considered – namely, the intrinsic value of developing products and services that will reduce suffering and improve the overall quality of life for millions of people around the world.

LIFE SCIENCES GROWTH DRIVERS

Growth in the life sciences industry, also referred to as the bio-economy, has been fueled by several important factors: innovation, access to capital, strong university and industry partnerships, evolving business models, and favorable public policy. Another recent key driver has been convergence – the bringing together of two or more discrete technologies or competencies to shape a completely new product or service. The emerging bioinformatics industry illustrates this convergence: gene sequencing relies not only on good biological services, but also on access to traditional information technologies, including data modeling, mass storage capabilities, and data-mining applications. Nanotechnology along with bio-manufacturing is the product of similar aspects of convergence.

WHAT MAKES UP THE BIO-ECONOMY?

The life sciences cast a wide swath making routine classification of the bio-economy difficult. As indicated below, the bio-economy consists of enabling technologies ranging from therapeutic drug design to waste treatment; from drought and insect resistant crops to genetic testing and gene therapy.

COMMERCIAL APPLICATIONS IN THE BIO-ECONOMY

Application	Societal Benefit
Agricultural	• Safer biopesticides • Improved yields for crops • Plant disease diagnostics
Industrial	• More efficient clean up of hazardous waste • Lower and more efficient energy consumption • Reduced manufacturing waste
Homeland Security	• Improved forensic medicine • Reduced bio-terror threats • Improved DNA fingerprinting
Health Care	• Better diagnostic tools • New therapeutic agents • Disease prevention • Gene therapy

The bio-economy includes not just the pharmaceutical, agricultural, biotechnology, and medical device arenas; it also extends to the health care services industry where cost reductions and productivity efficiencies are the focus. In addition to the recently completed and much-celebrated mapping of the human genome, there are a number of new research areas fueling life sciences research, commercialization and the bio-economy. These include:

Gene therapy: Gene therapy involves introducing a properly functioning replacement gene for a faulty identified gene. Despite lack of U.S. approval for this treatment and the significant regulatory hurdles, roughly 596 clinical trials involving 3,464 patients are currently under way in several countries. Researchers are using gene therapy in cancer, cardiovascular disease, and infectious diseases such as HIV. According to various industry figures, the gene therapy market is expected to reach $1 billion by the end of 2003.

Genomics and Proteomics: Genomics is a comprehensive research effort to identify and understand the body's full set of DNA and to combine this information with an understanding of every gene's biological function. Proteomics is the study of an organism's proteins and their role in an organism's structure, growth, health, disease, and the organism's resistance to disease.

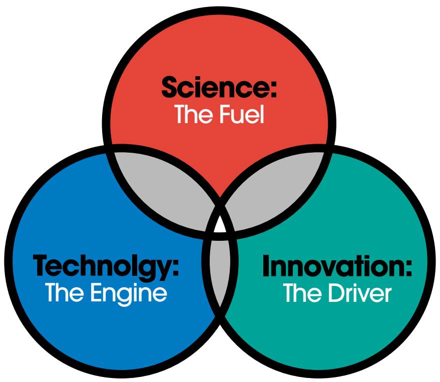
Bioinformatics: Another key sector is the science of bioinformatics, data analysis and advanced computing techniques applied to biological research. This area involves all aspects of the acquisition, processing, storage, distribution, analysis, interpretation, and display of biological information. The bioinformatics market is projected to exceed $1.5 billion by 2005.

Imaging: An important subset of life sciences research involves imaging, which is the science of producing computer images for studying the structure and function of organs and tissues that are healthy and diseased. Many of these techniques are noninvasive and can be applied to living human subjects.

PART TWO

THE RACE FOR ECONOMIC BENEFIT FROM THE LIFE SCIENCES

The requirements for success in the economy of the 21st century are fundamentally different from those of the 20th century. As Dr. William Brundage, the Kentucky commissioner of the Office for the New Economy, indicates: "Traditional economic development recruitment strategies of the past will not help a state or metropolitan area in the future – most economic growth within a region today results from the creation of new firms. Consequently, many states and regions are employing a new paradigm." While tactics differ, most regions have adopted an approach that leverages a three part strategy: augment life sciences research capacity; focus on commercialization of new life science companies; and attract and retain talented researchers and workers. In this new paradigm, science and research are the fuel, the resulting discoveries are the engine, and innovation is the driver.

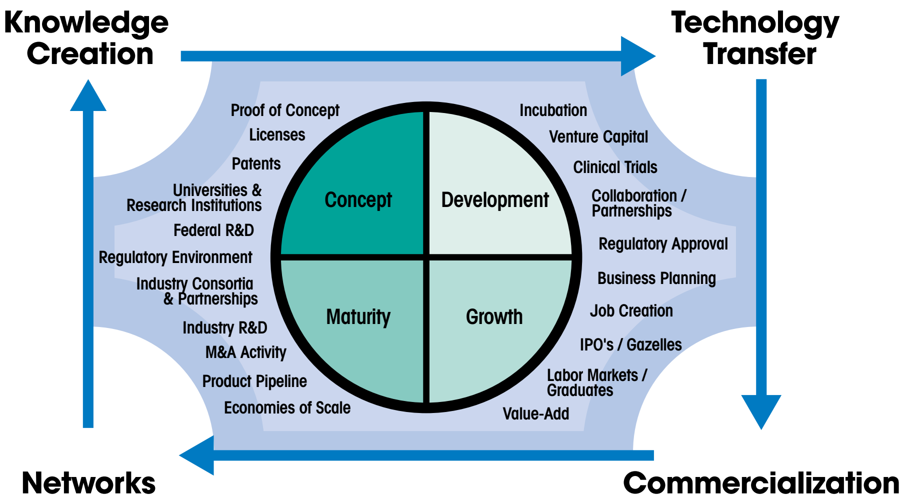


The infrastructure needed to ensure the success of this new paradigm includes four critical components: Research and Development; Commercialization; Capital; and Talent. The latter represents the best and brightest individuals in both the lab and in the workforce to assure development of new innovations and their ultimate commercialization. These four elements are critical components in what New Economy Strategies, a private life sciences strategy group, describes as the Life Science Innovation Lifecycle.

As the chart below illustrates, the Innovation Lifecycle is perpetual – knowledge creation leads to commercialization, which though a network of talented people and investment capital, leads to market success that leads to reinvestment and more and greater knowledge creation. And the cycle begins anew.

Technology-based economic development today is a bipartisan priority for many states and the life sciences sector is a key focus. Attesting to the seriousness of the competition, billions of dollars are being invested by a number of states to win the race for economic supremacy.

LIFE SCIENCE INNOVATION LIFECYCLE



Source: New Economy Strategies

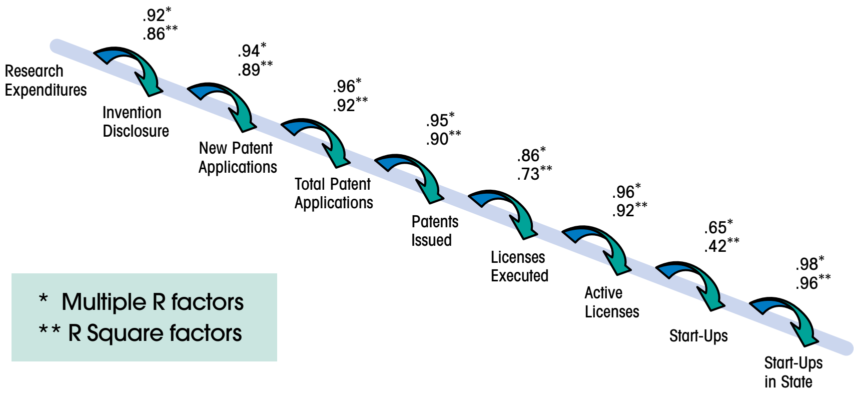
THE COMPETITIVE LANDSCAPE

Research

Given the highly competitive nature of the current race, it is useful to have an overview of the competition. Well-known technology centers like Silicon Valley and Route 128 in Boston have been key historical drivers of the U.S. growth economy. In the life sciences, however, these regions are being challenged by communities not previously considered habitats for science and technology. Birmingham, Louisville, and Pittsburgh are not traditional names when it comes to life science communities, yet all three have made significant strides in the last decade. It is apparent to these communities and many others that the life sciences sector holds significant potential for economic growth. Clearly, new competitors are not willing to concede the opportunity to the current technology leaders simply on the basis of reputation.

Why? New ideas are agnostic when it comes to geography and historical reputation. Research will spawn new innovations regardless of location. And there is abundant evidence of the connection between university-sponsored research and the intellectual property that results from that research. Decisio, a business consulting firm, demonstrated a very high correlation between the creation of intellectual property and university-sponsored research. The study, which was commissioned by the State of Kentucky, examined data from the 1,500 institutions across the country that make up the Association of University Technology Managers, a non-profit organization supporting the technology transfer profession. As the chart below illustrates, there is a direct relationship between research expenditure, patents issued, technology licenses, and eventually new company formation.

THE INTELLECTUAL PROPERTY WATERFALL



This link has motivated many states to include research and development in their economic development strategies. For example, Florida is considering a $100 million investment in university centers of excellence focused on biotechnology and nanotechnology. Louisiana's economic development plan calls for $187 million for a bioscience initiative involving universities and industry. Kentucky has invested approximately $500 million in this new infrastructure since 1998. Pennsylvania and North Carolina recently announced university biotechnology initiatives totaling $85 million and $100 million respectively. And Michigan has received significant press regarding the announcement that the state is committing $1 billion to the life sciences out of its share of the proceeds from the tobacco settlement fund.

Commercialization

Building research capacity, however, is only part of the formula. An April 2000 report by McKinsey & Company for the Houston Technology Center demonstrates the pitfalls of focusing solely on building research capacity. The McKinsey Report showed that Houston, which had approximately twice the annual life sciences funded research compared with San Diego, created, on average, five new life sciences-related companies annually. In San Diego, an average of 70 such companies were created on an annual basis. The difference is attributed to San Diego's large investment in a world-class commercialization support infrastructure to complement its investment in basic and applied research. The McKinsey Report concluded that Houston had no formal commercialization process and as a result lost much of the economic development that came from the research investment.

There is a direct relationship between research expenditure, patents issued, technology licenses, and eventually new company formation.

The Houston example suggests that while scientists are great innovators, they are not, with some exception, good at starting businesses. The best state and metro area economic development programs have recognized this and are creating innovation and commercialization centers that allow the scientists to concentrate on the science and to work with the private sector in order to move the resulting innovations to the marketplace.

Seed Capital

Another critical component for success is seed capital. Early-stage opportunities need adequate sources of risk capital to advance their ideas and business. A number of states have passed legislation that allows tax credits for monies invested in seed and venture funds that invest in firms located within their boundaries. For example, Kentucky now allows a 40 percent tax credit to encourage creation of angel investor, limited liability companies as well as seed and more traditional venture capital funds to invest in Kentucky companies. Iowa and Wisconsin have implemented similar measures. In fact,virtually every state with a technology economic development program is addressing the issue of seed capital.

Just as the railroad industry and agriculture were once economic engines leading the region to national prominence, Kansas City will be known as a leading global center of life sciences research and commercialization in the 21st century.

The commercialization component of the infrastructure also includes wet lab incubation facilities, which are especially important to life sciences startups because of the need for specialized laboratories and equipment. A wet lab incubator allows early stage companies shared access to critical equipment and laboratory space at an affordable cost. However, it must be understood that the incubator is simply a resource. Without a formal commercialization process, the right resources to provide entrepreneurial assistance and true seed and later stage capital, an incubator alone is not sufficient.

Talent

Economic and community development has always revolved around talent. Only recently, however, and largely through the work of Dr. Richard Florida, who measures "3Ts" — talent, technology, and tolerance to measure a communities success as a technology economic development engine – have community leaders possessed the necessary analytical tools to understand the tight correlation. The old model held that people would always follow the jobs. No longer. People, with their knowledge and their creativity, are the new natural resource. The new model states that companies (and jobs) will locate where they find the best and brightest people. Communities and regions that ignore this new model are risking their future. Consider the words of Carly Fiorina, Hewlett-Packard Chief Executive. Speaking to the nation's governors, she said: "Keep your tax incentives and highway interchanges; we will go where the highly skilled people are."

Florida's 3Ts are the distinguishing characteristics of a creative community and, according to Florida, predictors of a region's capacity for economic growth. These traits are also what will attract and retain talent over the long term. And talent, or human capital, has become every community's most vital

asset in today's knowledge-based economy. In the same way that resources have been devoted to the development of physical infra-structure, those communities that will compete and thrive in this emerging economy must take an aggressive, proactive approach to human capital.

Kansas City, in order to compete on the national and international stage, must emphasize the cultivation, recruitment, and retention of the talented individuals required to fuel its life sciences and technology initiatives.

WHAT DO THE LIFE SCIENCES MEAN FOR GREATER KANSAS CITY?

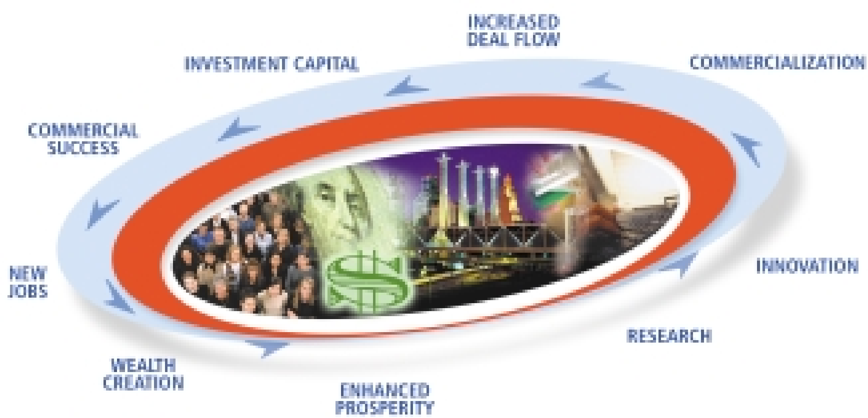
There is a vision shared by many community leaders: Just as the railroad industry and agriculture were once economic engines leading the region to national prominence, Kansas City will be known as a leading global center of life sciences research and commercialization in the 21st century. The potential economic impact of this vision of Kansas City's bi-state region cannot be overstated.

Certainly life sciences-based jobs support the researchers and/or the entrepreneurs who commercialize lab-developed products. However, the entire Kansas City bi-state region is the beneficiary of the growth of a life sciences research and commercialization sector. According to the U.S. Department of Commerce, each $1 million in research funding supports 41 jobs across the Kansas City region. These jobs not only encompass scientists, laboratory technicians and support staff, but also important sectors such as construction, the services industry and many other areas. When viewed in the context of research commercialization,it is evident that life sciences-based economic development can be a significant component to the greater Kansas City's overall economy.

All told, there is a proven formula for success that, if we are mindful of its practical implications, will allow us to win the race. As the chart

The next part of the formula is a state-of-the-art tech transer and commercialization infrastructure, including education mentoring, entrepreneurial support services, and seed capital that serve to support and nurture these ideas. Increased research combined with an effective infrastructure will yield increased deal flow, resulting in increased investor interest. As deals increase, there is a higher likelihood of more positive outcomes from these investments, creating a more fertile entrepreneurial environment.

This is the cycle that produces new wealth, more and better employment opportunities, higher standards of living, greater disposable income, and all the other benefits of a prosperous and enlightened community. That is why winning the race is important – our entire region can prosper from the new growth that awaits us.



CONCLUSION

An important point in Kansas City's race for economic supremacy is that the race is a marathon, not a sprint. Communities that understand this and commit to the long run will likely achieve the success alluded to by Ross DeVol of the Milken Institute who states: "Although discoveries in biotechnology / bioscience will benefit the entire human race, there is a different kind of race underway – one to determine where the new industries will cluster. The economic consequences will likely be immense. The pool of high paying equity-owning knowledge workers that those industries will attract, and the supplier infrastructure that develops around them, promise significant wealth creation for the winning regions."

Kansas City is off to a good start. In only a few short years, Kansas City is gaining a position of prominence in the Midwest and nationally due to several key developments. First and foremost is the launch of the Stowers Institute for Medical Research with its $1.2 billion endowment and aggressive plan to bring the world's best scientists to this region. Second, is the Ewing Marion Kauffman Foundation's commitment to commercialization and entrepreneurship in the bi-state region. Additional factors include Kansas City's strong cluster of renowned research and medical institutions in both Kansas and Missouri; the bi-state region's growing biotechnology-based entrepreneurial community; and the region's cohesive network of research and entrepreneurial support organizations. Together, these elements put the Kansas City bi-state region on the road to success.

To garner passion and support for these efforts, it is critical that we paint a vision for the future that elicits both community pride and commitment and that the life sciences vision for Kansas City, and our progress toward it, should be manifest in everything we do. We must set our standards high and we must work together to make the vision a reality while remembering that we do not have to be the biggest, only the best. A world leader in the life sciences can be the greater Kansas City region's destiny. However, as William Jennings Bryan wrote, "destiny is not a matter of chance, it is a matter of choice; it is not a thing to be waited for, it is a thing to be achieved." By making the commitment to collaboration and action, this community can set the world's standard for life sciences communities – but only if we work together to make it so.

In only a few short years, Kansas City is gaining a position of prominence in the Midwest and nationally due to several key developments. First and foremost is the launch of the Stowers Institute for Medical Research with its $1.2 billion endowment

GLOSSARY OF LIFE SCIENCES TERMS

Biotechnology
The means or way of manipulating life forms (organisms) to provide desirable products for man's use. Biotechnology in the United States has come to mean all parts of an industry that knowingly creates, develops, and markets a variety of products through the willful manipulation, on a molecular level, of life forms or utilization of knowledge pertaining to living systems.

Biochemistry
The study of chemical processes that comprise living things (systems). Despite the dramatic differences in the appearances of living things, the basic chemistry of all organisms is strikingly similar. Even tiny one- celled creatures carry out essentially the same chemical reactions that each cell of a complex organism (such as man) carries out.

Bioinformatics
This term generally refers to the use of computer technology in solving information problems in the life sciences. Specifically it involves the creation of extensive electronic databases on genomes, protein sequences, combinatorial chemistry and DNA sequencing research efforts in order to accomplish a research objective.

Biomolecular electronics
A branch of biotechnology that deals with the electro active properties of biological materials, systems, and processes together with their exploitation in electronic devices. Bioelectronics will attempt to replace traditional semiconductor materials such as silicon or gallium arsenide with organic materials such as proteins to create biochips.

Combinatorial Biology
A term used to describe the set of DNA technologies that are utilized to generate a large number of samples of new chemicals (metabolites) via creation of non-natural metabolic pathways. This collection of samples thus generated is called a "library," and the samples are then tested for potential use in drug-making.

Combinatorial Chemistry
A term used to describe a set of technologies that are utilized to generate a large number of samples of (new) chemicals, which are then tested (screened) for potential use (e.g., for therapeutic effect, in the case of a pharmaceutical). These large numbers of chemical samples, thus generated, are called a "library" and are screened (e.g., for therapeutic effect) via a variety of laboratory, biosensor, computational, receptor, or animal tests.

Genetic Engineering
The selective, deliberate alteration of genes (genetic material) by man. This term has come to have a very broad meaning including the manipulation and alteration

of the genetic material (constitution) of an organism in such a way as to allow it to produce endogenous proteins with properties different from those of the traditional, or to produce entirely different (foreign) proteins altogether.

Genomics
The scientific study of genes and their role in an organism's structure, growth, health, disease and resistance to disease. Some tools/methods utilized in genomics include: structural genomics, gene function analysis, functional genomics, chemical genetics, and gene expression analysis.

Microbiology
The science dealing with the structure, classification, physiology, and distribution of microorganisms, and with their technical and medical significance.

Molecular Biology
A term coined by Vannevar Bush during the 1940s that eventually came to mean the study and manipulation of molecules that constitute, or interact with, cells.

Nanotechnology
A new and developing technology in which man manipulates objects whose dimensions are approximately 1 to 100 nanometers. The technology also encompasses biochips, biosensors, and manipulating atoms and molecules in order to form bigger, but still extremely small functional structures and machines.

Proteomics
The study of an organism's proteins and their role in an organism's structure, growth, health, disease and resistance to disease. Such functional roles are highly dependent upon each protein molecule's tertiary structure/conformation. Some methods utilized to determine functions of specific proteins include: chemical genetics, gene expression analysis, and protein interaction analysis.

LIFE SCIENCES RESEARCH DEFINITIONS

Basic
Basic research is directed toward increasing essential scientific knowledge regarding specific mechanisms underlying biological processes. While extremely important information for understanding the physiology and function of biological systems, the knowledge derived from such efforts may not have a clear, direct, practical application.

Developmental
Developmental research is the systematic use and practical application of investigative findings and theories of a scientific or technical nature toward the production of, or improvements in, useful-products to meet specific performance requirements but exclusive of manufacturing and production engineering.

Clinical
Clinical research is generally patient-oriented research that is conducted with human subjects or on material of human origin such as tissues, specimens and cognitive phenomena for which an investigator directly interacts with human subjects.

Translational
Translational research is the conversion of innovative basic laboratory findings, into clinically relevant information, resources, or tools for use by health care providers to improve health outcomes of selected patient groups.

Clinical Trial
Clinical trial research performs controlled clinical testing of investigational new drugs, devices, treatments, or diagnostics. Alternatively, they compare new drugs, devices, treatments, or diagnostics with those previously approved to assess their safety, efficacy, benefits, costs, adverse reactions, and/or outcomes in human subjects. Such studies may be conducted under either a sponsor-developed or an investigator-developed protocol. These studies often are conducted in conjunction with obtaining new drug or device approval from the U.S. Food and Drug Administration in Phase I, II, III, or IV.

LIFE SCIENCES RESEARCH FUNDING SOURCES

Small Business Innovation Research Program (SBIR)
SBIR is a highly competitive federal research grant program that encourages small business to explore their technological potential and provides the incentive to profit from its commercialization. SBIR targets the entrepreneurial sector because that is where most innovation and innovators thrive. SBIR funds the critical startup and development stages and it encourages the commercialization of the technology, product, or service, which, in turn, stimulates the U.S. economy. For more information, visit: www.sba.gov/sbir.

Small Business Technology Transfer Program (STTR)
Like the SBIR, the STTR is a highly competitive federal research program that reserves a specific percentage of federal R&D funding for award to small business and nonprofit research institution partners. STTR combines the strengths of both entities by introducing entrepreneurial skills to high-tech research efforts. For more information, visit: www.sba.gov/sbir.

Advanced Technology Program
The Advanced Technology Program (ATP) provides federal funding for projects focused on the technology needs of American industry, rather than those of government. Research priorities for the ATP are set by industry, based on their understanding of the marketplace and research opportunities. For-profit companies conceive, propose, co-fund, and execute ATP projects and programs in partnerships with academia, independent research organizations and federal laboratories. The ATP awards are made strictly on the basis of rigorous peer-reviewed competitions. For more information, visit: www.atp.nist.gov.

LIFE SCIENCES GOVERNMENT ENTITIES

U.S. Food and Drug Administration (FDA)
The federal agency charged with approving all pharmaceutical and food ingredient products sold within the United States. Significant regulatory requirements and processes are set forth and monitored by the FDA before a pharmaceutical or medical device can be sold in the U.S.

National Institutes of Health (NIH)
The NIH is composed of a group of government medical research institutes that each focus on specific medical areas. The NIH is the major U.S. Government sponsor of biotechnology research.

KEY COMMERCIALIZATION TERMS

Technology Transfer

Technology Transfer refers to moving cutting-edge technologies developed at universities or government agencies to business and industry. This is traditionally accomplished by negotiating and executing licensing agreements that provide monetary and other benefits to the university where the technology was created.

Commercialization

Commercialization is the process of developing an idea to the point of introducing it to the marketplace. The goal of commercialization efforts is to turn the innovations of inventors, researchers, and entrepreneurs into business opportunities for the economic benefit of a specific community or state.

Venture Capital

Venture capital is comprised of independently managed pools of investment capital that focus on equity investment in privately held, growth-oriented companies.

Angel Investment

An investment made by a wealthy individual in an entrepreneurial growth company. While angel investors often perform similar functions as venture capitalists, angels invest their own money into a firm rather than invest institutional funds or capital from other investors.

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