THE TIME IS NOW.
A 10-YEAR VISION & STRATEGY TO ADVANCE THE LIFE SCIENCES

THE UNIVERSITY OF KANSAS & THE UNIVERSITY OF KANSAS MEDICAL CENTER
It starts as a dream. It ends as a cure.

When all is said and done, that’s the essence of the plan that guides our work.

As Daniel Burnham, the 19th-century American architect said,

“Make no small plans. They have no magic to stir humanity’s blood and probably themselves will not be realized. Make big plans; aim high in hope and work...think big.”

Big thinking is what we do at the University of Kansas Medical Center, but we’re driven by more than just good intentions. We’re committed to a strategic plan that offers a bold vision to dramatically expand the capacity of our region’s only academic medical center.

Together, we stand on the brink of a regional transformation — before us lies the very real opportunity to make Kansas City competitive with the nation’s finest regional life sciences networks. Some of the most important building blocks are already in place: the level of support we enjoy from Kansas taxpayers is among the best in the country; we have grown clinical income to support our enterprise; our faculty have competed successfully for external funding support; and last year, our external research funding grew 18 percent while our National Institutes of Health-funded research grew over 21 percent.

We are joined in our aspirations by key regional partners like the Stowers Institute for Medical Research (Stowers Institute). Jim and Virginia Stowers’ $2 billion gift has established the nation’s second-largest privately endowed institute for basic medical research right here in Kansas City. The Stowers Institute is
attracting world-renowned researchers to our region, and those researchers are turning to the University of Kansas Medical Center (KUMC) for academic opportunities. Twenty-one of the Stowers Institute’s 24 investigators hold faculty appointments at KUMC. The resources and stature of the Stowers Institute set Kansas City apart from the dozens of other regions vying for a piece of the life sciences pie.

Add to that current negotiations to create new educational and research partnerships with leading area institutions and hospitals — partnerships that will further increase the levels of support for the University of Kansas Medical Center.

The University of Kansas Medical Center, in conjunction with area institutions and hospitals, is prepared to bridge the gap between the laboratory bench and the patient’s bedside by expanding our research capabilities to deliver scientific discoveries to patients.

Regional greatness is within our reach, but it can’t be achieved without a world-class regional medical center. The foundation of the University of Kansas Medical Center is solid, but we believe the time is now to pursue a focused, long-term strategy designed to transform the University of Kansas Medical Center into a high-performing catalyst for advancing knowledge and cures. With this transformation comes the continuing evolution of our region and state into a community that can achieve prosperity in the new, knowledge-based, global economy.

The opportunities before us are highlighted in the report issued in 2005 by the Greater Kansas City Community Foundation’s Blue Ribbon Task Force. The Task Force, chaired by Dr. Benno Schmidt, a former president of Yale University, was charged with evaluating the state of higher education in Kansas City. Their conclusions, published in the *Time to Get it Right* report, urged Kansas City to invest significant new resources in our community’s higher education research powerhouse — the University of Kansas Medical Center.

That report introduced many in our region to the potential represented by life sciences research and the leadership role that KUMC would have to take to fulfill that potential. It did not, however, provide a specific program-based road map for how to achieve success.

This document is intended to provide such a road map.

All of us at KUMC are working tirelessly to maximize the resources of our community, but current resources alone will not be enough to achieve true transformational change.

We must secure significant philanthropic commitments to take advantage of the opportunities that lie ahead.

This document outlines areas of existing expertise that can be naturally expanded with additional resources, and it articulates those complementary areas where new initiatives can quickly take root and bear fruit. It is designed to define the areas of excellence that can be expected to flow from targeted philanthropic community support.
We know that for Kansas City and our region to transform our economy, we must have a world-class academic medical center. We know that our region will not become a top-20 life sciences center without a top-notch academic medical center. We know that the benefits of the Stowers Institute will not be captured and applied to enhance human health without the partnership of an equally strong academic medical center. We understand the challenges before us, and we’re ready to take action.

We ask you to consider this plan carefully. We welcome your comments and questions. We hope that this plan informs you about the opportunities that exist within our community to advance our shared vision to make the University of Kansas Medical Center the best community resource it can be. This vision can only become a reality with your help — and we are asking for it. Your advocacy, your investment, and your leadership to advance this plan are essential to its success. We look forward to working with you as, together, we move our region forward.

Sincerely,

Barbara Atkinson, MD
Executive Vice Chancellor, University of Kansas Medical Center
Executive Dean, University of Kansas School of Medicine
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OVERVIEW

The University of Kansas Medical Center has embarked on a 10-year journey to become a world-class life sciences research and teaching institution.

Our goal is to effectively enhance and link basic and clinical research, and to provide the leadership to translate those achievements into improved health care and quality of life for the greater Kansas City region, the State of Kansas, and the nation.

This journey represents the vision of not one organization, but many.

The University of Kansas Medical Center’s (KUMC) 10-year life sciences strategy is based on a regional collaboration among the region’s many life sciences assets, including the Stowers Institute for Medical Research, Midwest Research Institute, University of Missouri-Kansas City, University of Kansas-Lawrence, Kansas City University of Medicine and Biosciences, the Veterans Administration Hospitals, University of Kansas Hospital, Saint Luke’s Health System, Children’s Mercy Hospitals and Clinics, and Truman Medical Center. This long-term strategy is further bolstered by the area’s focus on entrepreneurial and collaborative life sciences research activities supported by the Kansas City Area Life Sciences Institute, the Kansas Bioscience Authority, the area’s clinical research organizations, and the strong regional philanthropic base.

Regional collaboration is paramount to reaching KUMC’s vision of attaining world-class status and the greater Kansas City area’s goal of becoming a top-20 life sciences region within 10 years. Other markets such as Boston, Philadelphia, and San Diego, which are world-renowned for their achievement in the life sciences, have strong partnerships among their academic medical centers, public and private universities, multiple area hospitals, and private research institutions.

Similar collaborative strategies are being implemented in markets like Cleveland, Indianapolis, Los Angeles, and Phoenix, where the focus on a common research university is creating new opportunities for numerous institutions. Each of these markets share academic medical centers that stand out as the centerpiece of their respective life sciences communities. They provide synergies between public and private institutions, elevating life sciences research and entrepreneurialism.

As articulated by the Greater Kansas City Community Foundation’s Time to Get it Right report, a successful life sciences strategy for the greater Kansas City region must include significant investments in its academic institutions. For KUMC, the report identified many opportunities for achieving world-class status, making it clear that KUMC must be at the forefront to promote a united regional vision that transcends the state line to bring area assets together for a common purpose.

Although this document is a road map to expand the research capabilities of the University and its Medical Center, it in no way diminishes our commitment to educating and training physicians and health care professionals for Kansas and the region. We remain steadfast in our education mission and recognize that quality researchers and clinicians often make the best teachers for our students. It is also important to note that this document is focused on research activities primarily housed on the Lawrence and Kansas City campuses. We recognize the stellar work that is conducted at the School of Medicine Wichita campus and look forward to working with our colleagues and stakeholders in Wichita to outline their vision for the future.

+ Greater Kansas City Community Foundation, Time to Get it Right report — http://www.gkccf.org/page22854.cfm
A transformation of this caliber can only be possible with the guidance of great leaders. KUMC is fortunate to embark on this journey with a gifted and committed team at the helm.

Leading KUMC is Executive Vice Chancellor (EVC) and Executive Dean of the School of Medicine Barbara Atkinson, MD, a nationally-recognized pathologist who rose to the EVC leadership position in January 2005. Under Dr. Atkinson’s direction, KUMC is advancing its research and teaching programs through reallocation and reinvestment of resources and the establishment of new partnerships.

Dr. Atkinson is raising the standards for basic, translational, and clinical research at KUMC. With goals of becoming a top-25 medical center in basic life science, a top-50 center in research and development, and quadrupling the external research funding from the NIH and private organizations to approximately $340 million annually in 10 years, Dr. Atkinson is committed to enhancing the Kansas City area life sciences initiative.

Her expectation is that each program obtain significant peer-reviewed funding from the NIH. For most established programs, the plan is to double current external funding in five years and quadruple it in 10 years. Emerging programs are expected to obtain $5 million in external funding grants in five years and double that in 10 years.

Richard Lariviere, PhD, is the newly named Provost and Executive Vice Chancellor for the Lawrence and Edwards campuses. Formerly the Dean of the College of Liberal Arts at the University of Texas, Dr. Lariviere is a life member of the Council on Foreign Relations and has served as a consultant to American and Indian companies in the information technology industry. Working together, they are planning and implementing Chancellor Robert Hemenway’s “one university” vision that serves Kansas and the greater Kansas City region.

Chancellor Hemenway, EVC Atkinson, and Provost Lariviere are leading the charge for the University. They have already made great strides toward building a first-rate cancer program and are overseeing parallel efforts to support established programs in neuroscience/brain health, maternal/fetal/child health, reproductive sciences/fertility, kidney and liver. Their efficacy as leaders has been well established, and they are ready and willing to take KU and KUMC to the next level.
The 10-year journey requires transformation at many levels.

KUMC’s partnerships with life sciences organizations must be expanded and enhanced to support the region’s and the University’s long-term life sciences strategies. In addition, a similar transformation must occur within KUMC and across the related disciplines in the University of Kansas system. That internal transformation must fully integrate the Medical Center’s biomedical research departments with complementary programs and efforts at the University of Kansas-Lawrence and the KU School of Medicine-Wichita. Doing so successfully will require a focus on three important areas: translational research, drug discovery, and the cultivation of research talent.

Translational Research

A key component to this transformation will be a renewed focus on advancing the translational research capabilities of KUMC across many disciplines. We will work to streamline the process of moving discoveries from the bench to the bedside, and we’ll dedicate new resources to these efforts.

This focus on translational research is consistent with the National Institutes of Health’s (NIH) recent launch of its Roadmap for Medical Research and, in particular, its priority for Re-engineering the Clinical Research Enterprise. The NIH Roadmap calls for a new emphasis on translational research designed to improve the movement of new discoveries from the bench to the bedside. Achieving excellence in translational research and drug discovery and development will allow KUMC and KU faculty to make more significant progress in disease prevention methods, diagnostics, and lifesaving treatments for patients.

The foundation for excellence in translational research already exists within KUMC. In October 2006, the NIH awarded KUMC, the Kansas City University of Medicine and Biosciences, and the Kansas City Veterans Administration Hospital — collaborators in the new Heartland Institute for Clinical and Translational Research (HICTR) — one of the new Clinical and Translational Science Award planning grants. Selection for this competitive award is a solid indicator that KUMC has what it takes to become a national leader in translational research.

In addition, there is more good news. KUMC just received another NIH grant totaling $7 million to support translational and clinical research in the Kansas City area. Together, these two grants position the HICTR to facilitate the translation of lab discoveries into lifesaving cures and to become a national model for excellence.
Drug Discovery

Connected with the HICTR is the drug discovery initiative at both the Kansas City and Lawrence campuses. A bi-campus team has come together to effectively articulate a 10-year drug discovery strategic plan focused on establishing the University of Kansas and its Medical Center as a premier institution in pharmaceutical research, pharmaceutical education, and commercialization of resulting intellectual property. A key player in this process is the Office of Therapeutics, Discovery and Development (OTDD), which was developed and launched in January 2006 as a bi-campus initiative to streamline and improve the drug discovery and development process. While the OTDD’s first focus area is cancer, the university expects there will be many opportunities for other disease areas to benefit from the process developed for cancer.

Cultivating Researcher Talent

The 10-year life sciences vision demands that KU and its Medical Center not only break new ground in the translation of research, but also provide a thriving research enterprise and the growing cadre of leaders to support this growth. In keeping with the educational mission of an academic medical center and the recommendations of the Blue Ribbon Task Force, it will be important to expand the PhD program offerings and add post-doctoral personnel for specific research projects. PhD students and post-doctoral personnel are essential contributors to any research environment. Increased emphasis on attracting talented students and post-docs to both the Kansas City and Lawrence campuses will be critical.
The transformation of KUMC will require significant growth — and to that end, significant philanthropic and private investment.

Over the next 10 years, KUMC will require an ongoing investment from the community to recruit 152 senior and 92 junior faculty and build and outfit more than 862,500 square feet of new research space.

With the addition of 244 faculty as part of the 10-year plan, KUMC has set a goal of increasing extramural grant funding (National Institutes of Health and other external sources) from approximately $85 million per year to $170 million per year by year five and $340 million per year by year 10.

The 10-year costs for faculty and facilities are estimated at $798.6 million.
While $798.6 million may seem extravagant to recruit new faculty researchers and build and outfit state-of-the-art facilities for their work, all economic indicators point to the potential for this investment to reap economic impact in the billions of dollars for years to come.

The amount of investment required is comparable to that of a new theme park or redevelopment of an entertainment district. The difference? In addition to fueling economic development, we will save lives.

Over the last five years, a number of studies have been conducted as part of the greater Kansas City life sciences initiative and the Kansas Economic Growth Act to indicate the potential return on research investments. The following highlights provide some illustration of the potential economic benefit of a substantial investment in the life sciences programs at KUMC and KU.

An economic impact analysis for Phase II of the Stowers Institute for Medical Research conducted by Andersen Consulting (2002) projected that adding one million square feet of research space and 900 researchers would mean more than $1.4 billion to the regional economy over 10 years.

The Kansas Economic Growth Act’s Bioscience Initiative (2004) was the first in Kansas to demonstrate that investing in the life sciences could mean significant growth in jobs and research funding across the state. A study conducted by the Kansas Technology Enterprise Corporation and Ernst & Young LLP projected that a $500 million state investment over approximately 10 years in life sciences researchers, facilities, technology transfer, and commercialization would yield 23,000 new bioscience jobs, 20,000 indirect jobs, more than $1 billion in research funding, and more than 100 new start-up companies.

The Perryman Group Study (2005), supported by the Kansas Technology Enterprise Corporation on behalf of the University of Kansas Cancer Center, demonstrates similar and even more far-reaching economic impacts associated with investment in the life sciences over 10 years. The Perryman Group specifically evaluated the impact of building a National Cancer Institute-designated Comprehensive Cancer Center at the University of Kansas. Based on extensive economic modeling, the study’s authors projected a $1.3 billion economic impact in year 10 and every year thereafter, which includes $80 million in extramural research funding, 9,400 permanent direct and indirect jobs, and $584 million in related social gains due to reduced cancer mortality.

The investments required to pursue this vision are significant, but they promise returns of economic, health, and social gains that stand to transform our entire region.

Within the 10-year KU/KUMC life sciences strategy are a number of established and emerging disease and organ-based research programs, translational research programs, and shared resources that need additional investment to support the broader initiative. Each program requires the recruitment of senior and junior faculty as well as space to conduct research and access to shared resources.

**Established Programs**
The established disease and organ-based research programs currently enjoy strong extramural grant funding and a critical mass of faculty supporting the research and, in many cases, clinical goals. They are the most developed of KUMC programs and, in numerous instances, are already demonstrating significant leadership on a national scale in the form of research publications, clinical care, and patent filings. Key faculty appointments and additional consolidated research space will lead to further enhancement of these programs.

**Emerging Programs**
The emerging disease and organ-based research programs are in development and have an initial core of faculty and research grants that warrant additional emphasis and funding. Along with the established programs, many of the emerging programs will play a significant role in the development of the Heartland Institute for Clinical and Translational Research and will benefit from the efforts to streamline the drug discovery and development process.

**Translational Research Programs**
The translational research programs are interdisciplinary in nature and typically involve a number of disease and organ-based research programs as well as shared resources. The focus of these programs is to improve the translation of basic research into lifesaving cures for patients. KUMC’s translational research programs have the potential to differentiate our community’s broader life sciences strategy from the rest of the country.

**Shared Resources**
Shared resources are functions or services within the university that support a number of disease and organ-based research programs and are critical to processing and analyzing data, running tests, and conducting research. Growth in the disease and organ-based research programs cannot occur without parallel investments in shared resources.

The following sections provide an overview of the programs and shared resources, including their anticipated needs for faculty, space, and equipment, and their goals for extramural grant funding.
KUMC has a number of established programs that form the foundation for becoming a world-class research and clinical center. In most cases, nationally-recognized scholars lead these programs and there is already significant momentum in their development.

The six established disease and organ-based programs include:

- Cancer
- Neuroscience/Brain Health
- Maternal/Fetal/Child Health
- Reproductive Sciences/Fertility
- Kidney
- Liver

The following table summarizes the established programs’ projected 10-year goals in relation to extramural research funding and the requested number of faculty and space allocations. Descriptions of each program area can be found in Appendix A.

<table>
<thead>
<tr>
<th>ESTABLISHED PROGRAM NAME</th>
<th>10-YEAR EXTRAMURAL GRANT FUNDING GOAL ($M)</th>
<th>REQUESTED FACULTY (#)</th>
<th>SPACE (S.F.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SENIOR</td>
<td>JUNIOR</td>
<td>CURRENT SPACE</td>
</tr>
<tr>
<td>CANCER†</td>
<td>$80</td>
<td>60</td>
<td>25</td>
</tr>
<tr>
<td>NEUROSCIENCE/BRAIN HEALTH†</td>
<td>$36</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>MATERNAL/FETAL/CHILD HEALTH†</td>
<td>$24</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>REPRODUCTIVE SCIENCES/FERTILITY</td>
<td>$32</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>KIDNEY†</td>
<td>$28</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>LIVER†</td>
<td>$17</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$217 M</td>
<td>93</td>
<td>51</td>
</tr>
</tbody>
</table>

† Programs with partner organizations
†† Maternal/Fetal/Child Health and Reproductive Sciences/Fertility are co-located.
EMERGING DISEASE AND ORGAN-BASED RESEARCH PROGRAMS

KUMC’s emerging programs will increase their presence in the next 10 years.

These programs include:
- Bioengineering
- Bone
- Diabetes
- Heart
- Immunology/Virology
- Integrative Medicine
- Obesity
- Ophthalmology
- Personalized Medicine
- Public Health

The following table summarizes the emerging programs’ projected 10-year goals in relation to extramural research funding and the requested number of faculty and space allocations. Descriptions of each program area can be found in Appendix B.

<table>
<thead>
<tr>
<th>EMERGING PROGRAM NAME</th>
<th>10-YEAR EXTRAMURAL GRANT FUNDING GOAL ($M)</th>
<th>REQUESTED FACULTY (#)</th>
<th>SPACE (S.F.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SENIOR</td>
<td>JUNIOR</td>
</tr>
<tr>
<td>BIOENGINEERING⁺</td>
<td>$10</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>BONE⁺</td>
<td>$10</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>DIABETES⁺</td>
<td>$10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>HEART</td>
<td>$10</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>IMMUNOLOGY/VIROLOGY⁺</td>
<td>$10</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>INTEGRATIVE MEDICINE</td>
<td>$10</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>OBESITY⁺</td>
<td>$10</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>OPHTHALMOLOGY⁺</td>
<td>$10</td>
<td>10</td>
<td>TBD</td>
</tr>
<tr>
<td>PERSONALIZED MEDICINE⁺</td>
<td>$10</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>PUBLIC HEALTH⁺</td>
<td>$10</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$100 M</td>
<td>54</td>
<td>36</td>
</tr>
</tbody>
</table>

* Programs with partner organizations
KUMC is quickly making a name for itself in the area of translational research, and there are significant opportunities to assume a leadership role on the national scale.

Two programs are critical to achieving this goal:

- Heartland Institute for Clinical and Translational Research (HICTR)
- Drug Discovery

The following table summarizes projected 10-year goals for the translational research programs in relation to extramural research funding and the requested number of faculty and space allocations. Descriptions of each program area can be found in Appendix C.

<table>
<thead>
<tr>
<th>TRANSLATIONAL RESEARCH PROGRAM NAME</th>
<th>10-YEAR EXTRAMURAL GRANT FUNDING GOAL ($M)</th>
<th>REQUESTED FACULTY (#)</th>
<th>SPACE (S.F.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SENIOR</td>
<td>JUNIOR</td>
</tr>
<tr>
<td>Heartland Institute for Clinical and Translational Research*</td>
<td>$15</td>
<td>15+++</td>
<td>18+++</td>
</tr>
<tr>
<td>Drug Discovery*</td>
<td>TBD</td>
<td>3+++</td>
<td>10+++</td>
</tr>
<tr>
<td>Estimated Total Core Programs</td>
<td>$15 M</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

* Programs with partner organizations
++ Faculty positions for the HICTR are included in other programs
+++ Faculty positions and space for Drug Discovery have already been accounted for in the Cancer Center Program
Biomedical research programs depend on shared resources to succeed. The following shared resources require critical and substantial investments to support the advancement of the University of Kansas and its Medical Center’s 10-year life science transformation:

- Bioinformatics
- Biostatistics
- Compound Synthesis
- High Throughput Screening
- Mass Spectrometry/Proteomics

The following table summarizes the shared resources’ projected 10-year goals in relation to the requested number of faculty, support staff, and equipment and maintenance costs. Descriptions of each program area can be found in Appendix D.

<table>
<thead>
<tr>
<th>SHARED RESOURCE NAME</th>
<th>SENIOR FACULTY</th>
<th>JUNIOR FACULTY</th>
<th>SUPPORT STAFF</th>
<th>EQUIPMENT &amp; MAINTENANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOINFORMATICS</td>
<td>2</td>
<td>0</td>
<td>8</td>
<td>$300,000 (one time)</td>
</tr>
<tr>
<td>BIOSTATISTICS</td>
<td>3</td>
<td>5</td>
<td>0</td>
<td>TBD</td>
</tr>
<tr>
<td>COMPOUND SYNTHESIS</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>TBD</td>
</tr>
<tr>
<td>HIGH THROUGHPUT SCREENING*</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>$100,000 per year</td>
</tr>
<tr>
<td>MASS SPECTROMETRY/PROTEOMICS</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>$200,000 per year</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>5</strong></td>
<td><strong>5</strong></td>
<td><strong>10</strong>++</td>
<td><strong>&gt;$200,000</strong>++</td>
</tr>
</tbody>
</table>

* All faculty, staff and equipment and maintenance costs associated with High Throughput Screening are accounted for in the Cancer Program.

++ Costs associated with support staff and equipment and maintenance are not included in the summary chart on page 10. Estimated support staff costs are approximately $75,000 per staff member and equipment and maintenance costs vary greatly. It is anticipated, however, that many of these costs can be covered by the resources’ fee-for-service structure.
The Greater Kansas City Community Foundation’s *Time to Get it Right* report could not have said it better — it truly is the time to get it right.

The time has come to commit to a focused long-term strategy that will transform the University of Kansas Medical Center into a high-performing institution driving new knowledge and lifesaving cures — one that will play an integral role in the cultivation of our regional life sciences opportunities. The benefits are clear — the greater Kansas City region and the State of Kansas will be players in the new, knowledge-based, global economy. And more importantly, we will improve the health of our citizens and prosper as a community.

The more than $2 billion investment in the Stowers Institute for Medical Research, the 10-year, $500 million investment in the biosciences by the State of Kansas, and the work to unite investment in the life sciences community, led by the Kansas City Area Life Sciences Institute, the Greater Kansas City Community Foundation and others, have created momentum towards excellence.

The foundation for KUMC’s 10-year life sciences strategy has been in the works for many years, and progress to date has been considerable. The time is ripe to capitalize on this region’s momentum and to reach for the next level — a level worthy of worldwide recognition.

Our goals are ambitious, and they will require the unified creativity and commitment of the entire region. Together we can recruit top talent, build and renovate world-class research laboratories, and attract external funding. We are poised to become a leading center of excellence in the life sciences.

The time is right...the time is now.

A 10-year, $798.6 million investment supporting established, emerging, and translational research programs and shared resources at KU and KUMC will bring to our region new jobs, new scholars, and new discoveries. It will foster economic development while improving our ability to train health care professionals, and it will give those professionals better options for treating devastating diseases. The transformation is within our reach.

Our dream has a plan...help us make it a reality.
APPENDIX A:
ESTABLISHED DISEASE & ORGAN-BASED RESEARCH PROGRAMS
Program Overview:

Cancer care and research is the number one priority for the University of Kansas and its Medical Center. Led by Director Roy Jensen, MD, the University of Kansas Cancer Center (KUCC) has set its sights on achieving National Cancer Institute (NCI) designation as a Comprehensive Cancer Center within 10 years. To do that, an aggressive 10-year strategic plan has been launched with multiple partners, including the Stowers Institute for Medical Research. The KU Cancer Center differentiates itself by two key strategies: 1) bench-to-bedside oncology drug development; and 2) the community-based Midwest Cancer Alliance, a region-wide network of oncologists and cancer care support professionals sharing best practices and driving advanced cancer care and clinical trials to patients’ communities. With a goal of significantly reducing the burden of cancer in Kansas, Western Missouri, and the nation, the KU Cancer Center will serve as a model for advancing cancer research, prevention, diagnosis, care, and survivorship from within patients’ own communities. Current extramural grant funding for the KUCC is $43.3 million per year, $14 million of which comes from the NCI, other institutions in the NIH, and other cancer-related granting organizations.

Long-term Plan:

The KU Cancer Center’s 10-year strategy is to achieve NCI designation first as a Cancer Center and then as a Comprehensive Cancer Center. This quest for NCI designation is time- and money-intensive, and it will require a $331 million investment over 10 years. During that time, it is expected that extramural grant funding will grow from a current $43.3 million per year to $54.4 million in year five and $80.1 million in year 10.

People, Infrastructure & Building Needs:

People, Infrastructure & Building Needs:

The KU Cancer Center plans to recruit an additional 60 senior and 25 junior faculty by year 10. The support staff will also experience significant growth from a base of 353 to 818 support staff by year 10. Finally, establishing six additional endowed chairs by year 10 will be critical to the fundraising and recruitment strategies.

Research space to house faculty and support staff will need to grow from a current 130,000 square feet to 440,000 in year 10.
Program Overview:
Led by Peter Smith, PhD, the neuroscience program at the University of Kansas and its Medical Center is well on its way to becoming a world-class translational research center with the ability to make significant progress in reducing the impact of neurological conditions on those afflicted and their families. Creation of the bi-campus Kansas Neuroscience & Brain Health Institute will build upon considerable existing strength in the following areas: 1) children and development; 2) brain injury and recovery; 3) brain aging and degeneration; and 4) translational neuroscience, including brain imaging, and therapeutics. Current extramural grant funding is $9 million per year.

Long-term Plan:
The 10-year plan for the Kansas Neuroscience & Brain Health Institute includes a number of key focus areas, including: establishing the institute’s leadership team; growing external research funding to $36 million in year 10; establishing critical enabling technologies; and expanding opportunities to commercialize research products and discoveries.

People, Infrastructure & Building Needs:
To establish and grow the Kansas Neuroscience & Brain Health Institute, the University of Kansas plans to grow the neuroscience and related senior faculty, including a director and co-director, from the current base of 16 senior faculty to 30 by year 10. An increase in 10 junior faculty also will need to occur, as will growth in the support staff. Establishing four endowed chairs by year 10 will be critical to the fundraising and recruitment strategies.

Research space to house faculty and support staff will need to grow from a current 30,000 square feet to 60,000 in year 10.
MATERNAL/FETAL/CHILD HEALTH
INSTITUTE OF MATERNAL-FETAL BIOLOGY

Program Overview:
The Institute of Maternal-Fetal Biology (IMFB) was developed from the Center for Reproductive Sciences in August 2002 and is led by Michael J. Soares, PhD. The IMFB is home to outstanding scientists pursuing research in the field of maternal-fetal biology and has made a significant contribution to research related to maternal and fetal health. The IMFB works closely with the Department of Obstetrics & Gynecology, which is led by Carl P. Weiner, MD, MBA. The current research group consists of 13 laboratories directed by faculty from: the University of Kansas School of Medicine in Kansas City; the University of Kansas School of Pharmacy in Lawrence; Children’s Mercy Hospitals and Clinics; and the University of Missouri-Kansas City School of Medicine.

The IMFB’s scientists investigate genes and proteins and their involvement in regulating maternal adaptations to pregnancy, immunology, placental biology, and fetal development. Currently, research focuses on two main areas. The first is diseases of pregnancy such as preeclampsia, early pregnancy loss, and intrauterine growth restriction. The second is diseases of the fetus leading to birth defects, including those associated with blood cell formation, sexual development, lung development, and those caused by maternal substance abuse. The fundamental knowledge derived from these research efforts will facilitate the design of therapeutics to promote the health of mothers and babies.

Long-term Plan:
The IMFB Program’s 10-year goal is to become the nationally and internationally recognized research institute for the investigation of maternal-fetal biology and medicine and the developmental origins of adult health and disease. To achieve this goal, the IMFB is focused on completing the development of current programs, acquiring federal funding for multi-investigator basic and translational research initiatives, participating in NIH-funded Translational Research Networks, and developing partnerships with pharmaceutical companies.

People, Infrastructure & Building Needs:
The immediate five-year plan is to obtain funds to renovate and equip two floors of the Wahl East Research Building. The 10-year plan is to construct a fully-equipped 200,000-square-foot research building that would be shared by scientists in the IMFB and the Center for Reproductive Sciences.

With $6 million in NIH funding, the IMFB plans to recruit an additional nine senior and five junior faculty by year 10 — bringing the total staffing to 27 senior and 10 junior faculty. The support staff will experience significant growth as well. Establishing four additional endowed chairs by year 10 will be critical to the IMFB’s fundraising and recruitment strategies.
Program Overview:
The Center for Reproductive Sciences (CRS) was established in 1995 at the University of Kansas Medical Center and employs nationally and internationally recognized research leaders focused on advancing research related to fertility and infertility. Under the leadership of Paul Terranova, PhD, the CRS is currently focused on improving methods to enhance female fertility using novel reproductive technologies. CRS researchers are also focused on development of novel male contraceptives in collaboration with scientists at KU-Lawrence, including a male contraceptive project that is focused on protecting against enlargement of the prostate. Current grant funding for the CRS is more than $8 million per year in grants from the NIH.

Long-term Plan:
By year 10, the CRS will need to expand its translational and clinical research base to integrate with the existing basic research strengths over the next 10 years. The CRS expects to double the current $8 million per year in NIH funding in the next five years and quadruple to $32 million in 10 years.

People, Infrastructure & Building Needs:
The long-term goal for the CRS is to consolidate all reproductive-related research into a 200,000 square foot state-of-the-art research building with the Institute of Maternal-Fetal Biology. Immediate needs of the CRS are recruiting three senior clinician scientists — two for female research and one for male — to solidify the translational research opportunity. In addition, raising $1.5 to $2 million to expand the live cell imaging core will be necessary to translate basic fertility research into treatments for patients.
Program Overview:

The Kidney Institute (KI) at the University of Kansas Medical Center has achieved many successes in basic and translational research that have brought national and international recognition to the University of Kansas. Led by L. Darryl Quarles, MD, the KI brings together basic and clinical researchers to uncover the molecular basis for normal and pathological function of the kidney, to identify targets important in regulation of kidney function, and to translate basic discoveries into new drugs, treatments, and diagnostics. The KI is organized into various scientific platforms that include basic science investigations, clinical trials, outcomes research, and biotechnology. The KI’s research is supported by $6.8 million in extramural grant funding from the NIH. The research has generated promising intellectual property, and discoveries made in the laboratory have provided insight into the origin of kidney disease and novel treatment options. Investment in the KI programs over the next 10 years will provide additional avenues to grow research that has a direct impact on the health care industry in the Kansas City area.

Long-term Plan:

The KI’s 10-year plan includes investments in the areas of new faculty, expansion of training programs, renovations of laboratory space, and new technologies/platforms. Development of a platform to apply intellectual property to drug development and disease diagnosis and treatment will be an important area of focus for the KI. Specifically, financial support is needed to fund partnerships with industry and new scientific platforms. Other funds are needed to develop additional research platforms, including support for the development of clinical databases and registries, tissue banks, and diagnostic and genetic testing. Each of these areas is critical to creating an environment for excellence in clinical research. Support to expand the training of post-doctoral fellows also is needed to increase the number of physician-scientists in the area. In addition to the immediate collaboration opportunities between the KU-Lawrence and KUMC campuses, partnerships with Children’s Mercy Hospitals and Clinics and Saint Luke’s Hospital also will be pursued.

People, Infrastructure & Building Needs:

The KI plans to recruit an additional three senior and six junior faculty by year 10 — bringing the total staffing to 12 senior and 25 junior faculty. The support staff will experience parallel growth. Establishing six additional endowed chairs by year 10 will be critical to the fundraising and recruitment strategies.

Research space to house faculty and support staff will need to grow from a current 25,000 square feet to 35,000 in year 10.
Program Overview:

Led by a team including Yvonne Wan, PhD, and Curt D. Klaassen, PhD, liver research at the University of Kansas and its Medical Center is experiencing exponential growth. At KUMC, in addition to a well-established Liver Transplant Group, the Department of Pharmacology, Toxicology and Therapeutics has recruited eight new faculty members whose primary research discipline is the liver. At KU-Lawrence, there are many liver researchers who have the capability to conduct drug discovery related to liver disease. Liver-related researchers currently receive $4.2 million in annual extramural funding.

Establishing the Liver Center at the University of Kansas Medical Center will build the needed infrastructure to foster the work of existing researchers and to attract new investigators. Liver disease is among the 10 major causes of death in the United States, yet there are only four NIH-funded Liver Centers in the United States. There is significant opportunity for the University of Kansas and its Medical Center to enhance its national and international recognition for its liver program with a new bi-campus initiative.

Long-term Plan:

KU plans to establish the Liver Center within the next year that will bring together basic science and clinical investigators to enhance the effectiveness of conducting translational liver research, and by year 10, build a first-class, NIH-funded liver center. Key focus areas include understanding the mechanism for progression of fatty liver to liver cancer, examining the genetic and epigenetic factors that contribute to liver cancer and other metabolic diseases, understanding the individual difference in liver metabolism, and discovering new drugs and diagnosis methods to prevent and treat liver cancer and related metabolic diseases.

People, Infrastructure & Building Needs:

The Liver Center plans to recruit an additional four senior and five junior faculty by year 10. The support staff will experience parallel growth. Establishing four additional endowed chairs by year 10 will be critical to the fundraising and recruitment strategies.

Research space to house faculty and support staff will need to grow from a current 14,000 square feet to 28,000 in year 10.
APPENDIX B:
EMERGING DISEASE & ORGAN-BASED RESEARCH PROGRAMS
BIOENGINEERING
BIOENGINEERING RESEARCH CENTER

Program Overview:
The establishment of the Bioengineering Research Center (BERC) enables the University of Kansas and its Medical Center to become a major force in life sciences research and education. Led by Paulette Spencer, DDS, PhD, and a team of researchers from KU and the University of Kansas Medical Center, the BERC will bring national and international recognition to the region in the area of bioengineering, including biomaterials, biomechanics, and bioimaging. This recognition will open the door to new funding opportunities for researchers and investigators participating in the BERC. The BERC brings together under one umbrella a synergistic team of material scientists, engineers from the diverse classical disciplines, pharmaceutical experts, life and physical scientists, computer scientists, clinicians, and clinical investigators. The BERC will promote and facilitate the collaboration within this diverse set of investigators at both KU and KUMC.

Long-term Plan:
Over the next 10 years, the BERC will seek to establish a high quality and highly productive level of research in bioengineering equal to that of current national leaders in the field. It will support a research and teaching environment that will serve as a catalyst for interdisciplinary investigations focused on, but not limited to, the following:

- Design, synthesis and characterization of novel biomaterials, both synthetic and tissue-engineered
- Development of clinical imaging devices
- Biosensor development and application
- Biomechanics of motion and response of physiologic function
- Fundamental multi-scale computational modeling and multi-scale bioimaging with various forms of energy (light, sound, etc.)
- Applications of engineering technology to basic biological sciences

People, Infrastructure & Building Needs:
The BERC plans to recruit an additional 10 senior and nine junior faculty — bringing the total staffing to 30 senior and 15 junior faculty by year 10. The support staff will experience parallel growth. Establishing five additional endowed chairs by year 10 will be critical to the fundraising and recruitment strategies. Infrastructure support will increase with the added team members. Research space to house faculty and support staff will need to be 180,000 square feet by year 10.

In addition, there is a need for significantly more bioengineering graduate students to support laboratories focusing on bioengineering research. This will require upfront investment in graduate student assistantships and fellowships. Along with the establishment of BERC facilities in Lawrence, it will be essential to establish a complementary bioengineering facility on the KUMC campus to support and promote both the bioengineering research and academic programs.
Program Overview:
The Kansas City Osteosciences Institute (KCOI) is developing from ongoing collaborations between KUMC and the University of Missouri-Kansas City (UMKC). Its mission is to bring together members of several departments to provide resources to facilitate the pursuit of common research interests in bone and cartilage. The goal of the KCOI is to serve as a catalyst for research in the area of musculoskeletal disorders, promote the training of graduate students and post-doctoral fellows, and establish core laboratories/scientific platforms to provide specialized tools for the study of bone, teeth, and cartilage. Areas of interest include:

- Metabolic bone disease, including osteoporosis, a disease affecting 10 million Americans and directly associated with aging
- Osteonecrosis, a pathologic condition which can develop secondary to treatment with drugs such as glucocorticoids or bisphosphonates
- Soft tissue and vascular calcifications, which are complications of aging, renal failure and diabetes
- Disorders of mineral metabolism, including hereditary and acquired hypo- and hyperphosphatemic disorders and hypercalcemia

These conditions appear to have a similar underlying pathophysiology, but have largely proven to be hard to treat.

Long-term Plan:
The 10-year development plan for the KCOI will launch an inter-institutional commitment involving support from KUMC, UMKC, the Stowers Institute for Medical Research, and community leaders. Immediate goals include defining space for the KCOI program at KUMC and establishing an administrative structure for implementing a common strategic plan and directing investments across institutions. Resources are needed to develop research platforms, support training of post-doctoral fellows, expand the number of physician-scientists in the area, and fund start-up packages for senior and mid-level investigators.

People, Infrastructure & Building Needs:
Specifics on the 10-year plan requirements for people, infrastructure, and research space are in development. Initial needs include funding for start-up packages and salaries for two senior faculty (physician-scientists) and approximately 10,000 square feet of research space by year 10.
**Program Overview:**

Like so many states, Kansas is part of the pandemic of diabetes that is sweeping the nation. An estimated 7 percent of Kansans (~188,000) have been diagnosed with diabetes and an equal number are undiagnosed. The major defining risk factor for diabetes is obesity, and in 2004, 61 percent of Kansans were either overweight or obese. On average, people with diabetes spend nearly five times as much for health care as a non-diabetic person. Establishing the Diabetes Institute is a priority that will enable the University to expand its focus on translational medicine as a means to reduce the incidence of diabetes and diabetic risk factors and help patients to more effectively manage the disease. David Robbins, MD, and Lisa A. Stehno-Bittel, PhD, PT, are currently leading this effort for KUMC.

**Long-term Plan:**

Over the next 10 years, creation of the Diabetes Institute will foster collaboration among existing investigators and attract new talent in areas related to diabetes in basic and clinical science, health care delivery, clinical research and patient care. KUMC will seek partnerships to develop the Diabetes Institute with the University of Kansas-Lawrence, the KU School of Medicine-Wichita, the University of Kansas Hospital, Children’s Mercy Hospitals and Clinics, Saint Luke’s Hospital, University of Missouri-Kansas City, and the Stowers Institute for Medical Research.

**People, Infrastructure & Building Needs:**

The Diabetes Institute plans to recruit 10 senior and 10 junior faculty by year 10. The support staff will experience parallel growth. To support recruitment for senior positions, 10 endowed chairs will be needed by year 10. Laboratory space for diabetes-related research will require an additional 30,000 square feet by year 10.
Program Overview:
Within the next 10 years, the University of Kansas and its Medical Center plan to invite a coalition of the Kansas City region’s medical and research community to form a joint Cardiovascular Research Institute. The Institute will focus on advancing basic research and education to support the more advanced cardiovascular care currently being offered by the region’s hospitals. Creating a Cardiovascular Research Institute will advance efforts to uncover the molecular basis for normal and pathological function of the heart, prevent cardiovascular disease, advance patient outcomes, and enhance rehabilitation strategies and methods for patients.

Long-term Plan:
Building the Cardiovascular Research Institute requires first and foremost an inter-institutional commitment from the University of Kansas and its Medical Center, University of Missouri-Kansas City, the University of Kansas Hospital, the Kansas City Veterans Administration Hospital, Saint Luke’s Hospital, the Stowers Institute for Medical Research, and community leaders. The first priority will be to develop a programmatic plan and recruit a physician-scientist director. An initial investment in an outcomes platform that will combine outcomes investigators at KUMC and UMKC with the cardiovascular research program at Saint Luke’s is also a high priority.

People, Infrastructure & Building Needs:
The Cardiovascular Research Institute plans to recruit at least two senior and one junior faculty by year 10. Infrastructure support will need to grow, as will research space. Further details on the 10-year strategic plan for cardiovascular research are in development.
Program Overview:

Under the leadership of Opendra “Bill” Narayan, DVM, PhD, KUMC is developing a program in basic and clinical immunology research and has made significant progress in the area of allergic diseases. During the past two years, KUMC recruited two tenure-track basic immunologists whose interests lie in the development of adaptive immune mechanisms. A third immunologist, interested in development of effector T cells, was recruited to the Department of Pathology. Establishment of a program in immunology would drive the recruitment of at least five more tenure-track junior faculty members and three senior faculty members who will already have established programs. It will be important to house these individuals contiguously to foster informal interactions and take advantage of shared resources. In addition, it is expected that these scientists will establish collaborations with clinicians in the School of Medicine and collaborations with scientists at the University of Missouri-Kansas City.

Long-term Plan:

The 10-year plan for Immunology/Virology is to develop a program in basic and clinical immunology focused on the functions of the immune system with respect to disease processes. The program will be comprised of junior and midlevel scientists, who will each have his or her own research programs in some aspect of basic immunology. The long-term goals of each program would be to establish collaboration with other scientists studying the immune response with respect to prevention of infectious diseases, dissecting the role of the immune system in mediating autoimmune and allergic diseases, and to understand mechanisms by which infectious pathogens and malignant oncogenic processes escape immune surveillance. Collaborations with researchers at the University of Kansas-Lawrence, University of Missouri-Kansas City, Children’s Mercy Hospitals and Clinics, and the Stowers Institute for Medical Research will continue to expand.

People, Infrastructure & Building Needs:

The most critical immediate needs for Immunology/Virology are salary and start-up packages for new faculty recruits and contiguous space and resources that could be shared among investigators. By year 10, the plan is to recruit at least three senior and five junior faculty and a corresponding increase in support staff. Research space will grow by 6,000 square feet by year 10.
Program Overview:
The program in Integrative Medicine (IM), also called complementary and alternative medicine (CAM), is led by Jeanne Drisko, MD, at the University of Kansas Medical Center. An increasing majority of American health care consumers seek out and use CAM even without significant evidence of its effectiveness. The Integrative Medicine program is uniquely positioned to:

- Develop and execute research projects and publish research findings in the area of complementary and alternative medical therapies
- Practice integrative medicine in a clinical setting
- Provide integrative wellness services in one setting
- Educate conventional and alternative medical students and practitioners about the role and practice of integrative medicine
- Provide service to the public, policy makers, legislators, and the medical community

The IM program differentiates itself from private CAM clinic models by its affiliation with an academic medical center, including high-quality research that is currently missing from most CAM clinics. Patients recognize the value of the program because of its comprehensive nature, its competent professionals, and its broad range of health services in an academic setting. Current research protocols include the use of intravenous vitamin C during cancer care, trials to assess chelation therapy in cardiovascular disease, evaluation of bioidentical or “natural” hormones in menopause, and a trial to assess the pharmacokinetics of intravenous vitamin C.

We are currently in the process of establishing a Samueli Institute/KUMC partnership to acquire federal appropriations for support of a comprehensive CAM cancer program, which dovetails with the Medical Center’s mission to achieve NCI designation and grow the cancer research portfolio.

Long-term Plan:
The program in Integrative Medicine has a long-term strategy to establish a Center of Excellence for Complementary and Alternative Medicine and Research to secure NIH funding, establish a research track record, and foster cross-institutional collaboration. In addition, the IM program will develop online courses to provide educational opportunities for practicing physicians and provide an integrative medicine fellowship at KU Medical Center to train the next generation of physicians in the best practices of CAM. Finally, a wellness clinic model is under development. We anticipate the ability to grow the research portfolio to $5 million by year five and $10 million by year 10.

People, Infrastructure & Building Needs:
The program in Integrative Medicine plans to recruit four senior and four junior faculty, including one basic science researcher, and 15 support staff to include advanced nurse practitioners, an acupuncturist, registered nurses, a massage therapist, and others. Establishing this goal by year 10 will require aggressive recruiting and fundraising. Space to house the future Center is estimated to be 6,000 square feet for the core program, 5,000 square feet for the Wellness Program, and 1,500 square feet for laboratory space.
Program Overview:
The Obesity program, founded by scientists at KU-Lawrence, now includes collaborations with scientists at the Medical Center campus and at Children’s Mercy Hospitals and Clinics. Specifically, three KUMC faculty focused on obesity-related research currently receive $2 million per year in extramural grant funding. With the growth in obesity research, there is a significant opportunity to expand the related research programs at the University of Kansas. This effort is currently led by Joseph E. Donnelly, EdD, from the Lawrence campus and Debra K. Sullivan, PhD, RD, from KUMC.

Long-term Plan:
Establishment of the Center for Physical Activity, Nutrition and Weight Management at the University of Kansas will be a critical contribution to fighting the regional and national epidemic of obesity in children and adults. Because obesity causes and/or impacts all chronic diseases, establishing a Center focused on obesity will serve to unite many disciplines and institutions in Kansas City, including medical schools, hospitals, and community organizations.

People, Infrastructure & Building Needs:
The Center plans to recruit an additional 10 senior and four junior faculty by year 10 — bringing the total staffing to 12 senior and six junior faculty. The support staff will experience parallel growth. Establishing three endowed chairs will be critical to the fundraising and recruitment strategies.

Research space to house faculty and support staff will need to grow from a current 10,000 square feet to 24,000 by year 10.
Program Overview:
The Ophthalmology program’s strategy is threefold:

- Build a credible, academically centered clinical practice encompassing all aspects of ophthalmology
- Develop the research program around the concept of a Center for Ophthalmic Engineering with emphasis on optics, refractive surgery, intraocular approaches and biomechanics of the eye. Many conditions of the eye, including glaucoma, retinal and neuroophthalmic diseases as well as tissue engineering and genetic determinants of ocular physiology and pathology can be explored using engineering principles.
- Develop a competency-based residency program to better meet the needs of ophthalmology trainees and Kansans

The Ophthalmology program is working toward a stand-alone department with clinical, surgical, teaching, and research facilities located in close proximity to maximize team-oriented research. John E. Sutphin, Jr., MD, has recently joined KUMC as the new chair and will lead this strategic effort.

Long-term Plan:
Ophthalmology naturally lends itself to collaboration with small entrepreneurial companies in developing niche products of high value. A strong ophthalmology department can take advantage of many opportunities that exist in the region. Ophthalmology priorities for the next 10 years include:

- Develop clinically and academically to build a regional reputation of first-class training and patient care;
- Recruit prominent scientists and biomedical engineers to make up the core group for the Center for Ophthalmic Engineering (could be done in conjunction with biomedical engineering including bioinformatics); and
- Identify philanthropy to expand facilities to house research and a Clinical Eye Institute.

People, Infrastructure & Building Needs:
In 10 years, the Ophthalmology program plans to have 10 senior faculty ophthalmologists in glaucoma, retina plastics, cornea, and general ophthalmology. Space for the program is still under consideration.
Program Overview:

Led by Greg Reed, PhD, the Center for Personalized Medicine has two goals. The first is to accelerate the development of potential new drugs by designing, performing, and interpreting studies of the first administration of these agents in humans. These “first in human” studies, referred to as Phase 1 studies, are the essential bridge between a chemical being an interesting tool for laboratory experiments and becoming a useful drug for humans. The second goal is to define the relationships between a patient’s genetic makeup and various external factors that alter how that individual patient will respond to a particular drug. This pharmacogenomic approach to medicine will provide the basis for drug therapies personalized for the environmental and genetic characteristics of the individual patient. The resulting tailored therapy will truly be the “best in humans.”

A bench-to-bedside effort for drug development requires the “first in humans” mission of this Center. Researchers on the Lawrence campus have discovered numerous new drug candidates and novel formulations, and at least five of those are now in clinical use. With more candidate drugs being developed in Lawrence and at the Medical Center, there is an urgent need to expand and utilize the capabilities of the Center for Personalized Medicine. The growing national emphasis on pharmacogenomics and the resulting ability to practice personalized medicine underscore the urgent need to expand our efforts to realize “best in humans” therapies.

People, Infrastructure & Building Needs:

The Center needs to add one senior and two junior faculty, as well as fellows, a full-time director of the Center, one additional PhD for bioanalysis and pharmacokinetics, additional study coordinators and research assistants, and additional support in statistics, data management, and quality assurance monitoring. Research space will need to grow by 3,000 square feet. Additional analytical instruments, such as a UPLC-QTOF mass spectrometer and equipment for sample processing will also be required.

Long-term Plan:

The Center for Personalized Medicine must expand its capacity in order to perform at least three Phase 1 trials per year. It also must provide additional bioanalytical and pharmacokinetics support for other clinical studies within the Medical Center and other area clinical sites.
Program Overview:
Almost all major life sciences research universities are closely affiliated with thriving programs in public health — programs that translate scientific advances into better health for the community. The University of Kansas and its School of Medicine campuses in Kansas City and Wichita have numerous assets, including Edward F. Ellerbeck, MD, MPH, who leads the effort to build a new program in public health. This effort will build upon strategic alliances with local communities, businesses, health care providers, government, and other academic centers to ensure better health and more cost-effective, equitable health care for our citizens. This program will bring together the strengths of our University and community under the umbrella of a regional alliance for public health by 2008. Developing an Institute of Public Health by 2010 will be a critical next step in creating world-class research, education, and service programs. This new, unified structure and emphasis on public health will allow the University to more effectively address the many health issues facing Kansas and the region and ensure that our entire community derives clear, measurable benefits from new discoveries.

Long-term Plan:
The Institute of Public Health will have a threefold mission dedicated to research, education, and service. The program will have a major service mission to the State of Kansas and the Kansas City region, addressing the public health needs of the area. Key areas of the Institute will provide critical support to the advancement of the life sciences initiative, including: educational infrastructure needed to support a rapidly growing basic science, clinical, and translational research program; expansion of the cancer prevention and control research programs needed for an NCI-designated Comprehensive Cancer Center; development of a molecular epidemiology program that will foster translational research programs; enhancement of biostatistical training and research support; and creation of a robust theoretical and applied health services research program.

People, Infrastructure & Building Needs:
Forming an Institute of Public Health will require recruitment of key program leaders in epidemiology, social and behavioral health, and environmental medicine. In addition, it will require significant expansion of the program in biostatistics (see Shared Resources section). Existing graduate education programs in clinical research training will need to be expanded, and doctoral-level training programs in key areas such as health services will need to be developed.

The Institute of Public Health plans to recruit an additional two senior and one junior faculty by year 10. Establishing two additional endowed chairs by year 10 will be critical to the fundraising and recruitment strategies. Research space to house faculty and support staff will need to grow from a current 15,000 square feet to 40,000 in year 10.
APPENDIX C:
TRANSLATIONAL RESEARCH PROGRAMS
HEARTLAND INSTITUTE FOR CLINICAL AND TRANSLATIONAL RESEARCH

Program Overview:

KUMC is establishing the Heartland Institute for Clinical and Translational Research (HICTR). Led by Richard Barohn, MD, and Lauren Aaronson, PhD, RN, FAAN, the HICTR is a multidisciplinary home for all infrastructure activities related to clinical and translational research at KUMC. Under the umbrella of the HICTR, there will be a number of centers including, education/training, regulatory, an expanded Clinical Research Resource Center, biostatistics/informatics, novel methodologies/technologies, and health disparities research. The HICTR will capitalize on the research and related infrastructure strengths of KUMC and focus not only on coordinating resources dispersed across KUMC, but also on integrating the strengths and resources of KU-Lawrence, KU School of Medicine-Wichita, and other partnering institutions in the greater Kansas City area. Establishing the HICTR as a regional resource is congruent with other activities aimed at making Kansas City a center of excellence in life sciences research.

Long-term Plan:

In October 2006, KUMC received a Clinical and Translational Science Award planning grant from NIH to launch its efforts to establish the Heartland Institute for Clinical and Translational Research. Additional NIH funding was just received to further KUMC’s clinical and translational research efforts. The goal for HICTR is to increase NIH funding from approximately 2.5 million per year to $10 million per year. Key to the success of the HICTR will be working closely with partnering institutions — the Kansas City University of Medicine and Biosciences, Kansas City Veterans Administration and Medical Center, Saint Luke’s Hospital, Children’s Mercy Hospitals and Clinics, KU School of Medicine-Wichita, Higuchi Biosciences Center, and the Schiefelbusch Institute for Life Span Studies at KU-Lawrence. It also will be important to engage the private-sector life sciences community in the pursuit of clinical and translational research opportunities. Additionally, community and local research participants can add value as active voices in developing procedures and policies for research interactions within the HICTR.

People, Infrastructure & Building Needs:

In conjunction with other programs, departments and centers, the HICTR will recruit 15 senior and 18 junior faculty by year 10. The support staff will experience significant growth as well, from two staff members currently to 18 by year 10. Research and office space to house faculty and support staff will need to grow from a current 7,000 square feet to 25,000 square feet in year 10.
Program Overview:
KU Drug Discovery, led by Scott Weir, PharmD, PhD, is in the process of building a completely integrated, university-wide, multi-campus organization of researchers, facilities, centers, and institutes. Within 10 years, KU expects to outperform all other academic institutions in the discovery of promising pharmaceutical agents for all therapeutic and pharmaceutical areas of research supported by Drug Discovery.

Long-term Plan:
Over 10 years, KU Drug Discovery plans to improve the rational drug design capabilities and capacity, expand high throughput screening as a core service, establish a target production core, streamline enabling processes, expand the capacity and capability to support drug discovery, and leverage unique abilities of KU Drug Discovery for educational purposes.

People, Infrastructure & Building Needs:
KU Drug Discovery plans to recruit three senior faculty (eminent scholars in medicinal chemistry), 10 junior faculty, and 75 graduate students by year 10. The technical staff will experience significant growth as well with a need to recruit approximately 20 support staff to manage target production, compound management, product development, imaging technology, informatics, high throughput screening, and process chemistry. Establishing three endowed chairs over the 10-year time period will be critical to the fundraising and recruitment strategies.

Research space to house faculty and support staff by year five will need to be approximately 39,000 square feet and another 39,000 square feet by year 10. All of this space is currently accounted for in the 10-year Cancer Center Business Plan.
APPENDIX D:
SHARED RESOURCES
Bioinformatics, led by Peter Smith, PhD, is a new field that developed at the interface of biology and computer science. Technological advances have produced increasingly large amounts of novel biological data, while at the same time, computers have become increasingly powerful. Together, these two trends gave rise to the new field of bioinformatics, which holds tremendous promise for improving human health.

The Kansas City area was fortunate to make early inroads in bioinformatics. In the last six years, bioinformatics facilities were established to serve the needs of investigators at University of Missouri-Kansas City, Children’s Mercy Hospitals and Clinics, and Stowers Institute for Medical Research. Importantly, through NIH funding from the National Center for Research Resources and the National Institute of Child Health and Human Development, a Kansas Bioinformatics Network was established in 2001. With core sites located at Wichita State University, Kansas State University, University of Kansas and the lead site at the University of Kansas Medical Center, this network ties together areas of bioinformatics strength in order to serve the needs of researchers and students throughout the greater Kansas City area and across the state of Kansas.

By its very nature, bioinformatics is a rapidly evolving field, requiring a commitment of ongoing resources to keep up with the most up-to-date research techniques. KUMC deals directly with the needs of the biomedical and clinical sciences community, and the application of bioinformatics to biomedical problems represents both the greatest challenge and the highest potential reward.

Long-term Plan:
Over the next 10 years, we need to strengthen our bioinformatics core support activities and establish senior investigator programs in which bioinformatics is a key component of their research. We envision a model in which new core support staff interact closely with researchers in clinical and basic sciences to assist in data analysis and biomarker discovery. These staff members will be aided by computer programmers who are adept in devising and modifying programs to meet the specialized needs of these researchers. Acquisition of supercomputer resources in subsequent years will aid in the development and implementation of these software platforms. These advances in infrastructure will lay the groundwork for the recruitment of senior researchers with interests in areas such as pharmacogenomics, biomarker discovery, brain imaging, and drug development, who can interface with existing centers and areas of research strength.

People, Infrastructure & Building Needs:
In order to meet Bioinformatics’ evolving needs, significant investment is essential. Specifically, over the next five years, the strategic plan includes the following: increase bioinformatics core staff — four additional support staff positions must be created and filled; increase computer scientist staff — four additional support staff positions are required; enhance supercomputer facilities — upgrade cost of $300,000; and recruit new bioinformatics faculty — in particular, two senior faculty. Appropriate space will also need to be dedicated.
Biostatistics is a key infrastructure for institutions conducting medical research. Nearly all clinical and population science research grants, and most basic science studies, require biostatisticians as co-investigators. Having a workforce of scientists with PhD-level training in statistics or biostatistics ensures proper study design and that analysis methods are in place for research studies. KUMC recently created a Department of Biostatistics from a small but very strong core group of biostatisticians within the Center for Biostatistics and Advanced Informatics. Led by Matthew Mayo, PhD, a solid biostatistics department is necessary in achieving NCI designation for the KU Cancer Center as well as achieving a Clinical and Translational Science Award from NIH. Biostatistics is also one of the five focus areas needed for the creation of an Institute of Public Health. Having scientists trained at the PhD level in statistics or biostatistics in the department is necessary for KUMC to double NIH funding within five years and double it again within 10 years.

Long-term Plan:
KUMC’s new Department of Biostatistics will expand to 12 tenure-track faculty members within 10 years. The department will also establish a masters in science program in biostatistics within three years and a PhD program within 10 years. This will add a trained workforce of both masters- and doctoral-level scientists in biostatistics to the region. Further, the department will expand its collaborations throughout KUMC, KU-Lawrence and the region by establishing itself as a leading academic biostatistics department.

People, Infrastructure & Building Needs:
The Center for Biostatistics and Advanced Informatics plans to recruit three senior faculty and five junior faculty by year 10. The year-five Biostatistics Department’s total annual budget is estimated to be $2.3 million, of which approximately $1.3 million would be from grants and contracts. The year 10 budget is estimated at $3.4 million, of which at least $2 million would be from grants and contracts.
COMPOUND SYNTHESIS

Shared Resource Overview:
At a fundamental level, the drug discovery process may be viewed simply as the process of modulating the function of biological targets using compounds in order to probe, understand, and control the biology of health and disease. The KU Compound Synthesis core function will collaborate with researchers to develop tool compounds in KU Drug Discovery programs.

There is a significant need for tool compounds to support the drug discovery process from target selection and validation through selection of a development candidate. The KU Cancer Center’s Office of Therapeutics, Discovery and Development has estimated that the current need for tool compounds within the University is eight compounds per year. The Office has estimated that this need will grow to 24 to 32 compounds per year over the next 10 years.

Long-term Plan:
Over the next 10 years, the phased privatization of two NIH-funded Centers within the Department of Medicinal Chemistry, the COBRE Center for Cancer Experimental Therapeutics and the Center of Excellence in Chemical Methodologies and Library Development, along with the completion of the Structural Biology Center Phase III, will establish the infrastructure required to meet the need for this shared resource. The critical need will be to retain and grow the current number of full-time employees that support the two Centers, and maintain and grow the inventory of state-of-the-art hardware and software that underpin the effort.

People, Infrastructure & Building Needs:
The staffing, infrastructure and building needs for the KU Compound Synthesis core function are in development. Initial plans include hiring at least one full-time synthesis chemist.
HIGH THROUGHPUT SCREENING

Shared Resource Overview:
The High Throughput Screening (HTS) shared resource plays a key role in KU Drug Discovery. HTS affords rapid, efficient identification of chemical hits. Activity-based assays, whether cell- or enzyme-based, are developed within the laboratories of KUMC, KU-Lawrence, the Stowers Institute for Medical Research, and Children’s Mercy Hospitals and Clinics. These assays, developed at a bench scale, are modified and automated to afford rapid, high-volume screening of compounds for biological activity. Compounds contained within the chemical library, as well as compounds synthesized by KU researchers, are screened.

HTS is a core function that will support all KU Drug Discovery programs. Notable programs include support for the Cancer Center and the eventual Neuroscience and Brain Health Institute cross-campus initiatives, the male reproductive center, as well as discovery programs in other therapeutic areas arising within the University. HTS will also support drug discovery programs initiating from Stowers and Children’s Mercy. HTS will be utilized to identify chemical hits, thus generating preliminary data which will be highly leveraged to obtain federal research funding.

Long-term Plan:
An active search for the HTS director is ongoing. The KU Cancer Center is funding 75 percent of the director position through April 2010. Beyond this date, the Cancer Center will fully fund this position. Additional staff are required to create a critical mass of expertise and to meet the demands of an increased workload (as a result of implementation of the KU Drug Discovery Strategic Plan). Capital investment in equipment, information management systems, and continued expansion of the commercially purchased chemical library are required over the next 10 years. The KU Drug Discovery Strategic Plan requires that HTS conduct 50 screens per year to adequately support the KU research effort. It is anticipated that HTS will achieve this volume of work by year five.

People, Infrastructure & Building Needs:
The critical needs for the HTS over the next 10 years are investment in at least one senior and two junior faculty and three support staff, as well as related equipment.
MASS SPECTROMETRY/PROTEOMICS

Shared Resource Overview:
The Mass Spectrometry/Proteomics Laboratory (MSPL) of KUMC is a state-of-the-art research unit that provides highly sophisticated technical services for researchers throughout the Kansas City area. Mass spectrometry (MS) is an extraordinarily sensitive and accurate technique that relies on instruments capable of separating large biomolecules based solely on their mass and charge, and it is particularly useful in the identification and analysis of proteins. The MSPL is already working with local researchers to identify protein markers associated with diseases like thyroid and prostate cancer and hypertension.

Similarly, changes in overall protein expression are monitored by MS to study how a nutrient, hormone or drug alters tissue over time. Other collaborative studies being performed in the MSPL include rapid structural changes in proteins that are associated with functional changes, the interaction of proteins with target molecules, and the modification of proteins as a result of oxidative reactions, hormonal stimulation and diabetes.

The MSPL is currently run by its Director, Dr. Antonio Artigues, and a senior scientist, who perform all the research and routine maintenance. In addition to MS, the facility also offers a variety of instruments for automated sample processing, automatic digestor and automatic MALDI spotter. A Typhoon gel scanner is also available for sensitive protein detection using a variety of fluorescent dyes. These auxiliary instruments further complement the broad proteomics approaches available in the MLPS. These capabilities are essential at a research university to secure extramural funding, which in turn leads to discoveries.

Long-term Plan:
The technology and expertise offered by the MLPS is intended to facilitate securing more extramural funding by researchers throughout the area, as the facility is open to all users on a fee-for-service basis. In addition, the MLPS will actively promote utilization of the techniques and instrumentation it offers through individual teaching and workshops on different areas of proteomics. Finally, a Web resource is being developed as an initial contact point and a source of technical advice.

People, Infrastructure & Building Needs:
The various experimental approaches described above utilize different types of MS, each having a particular advantage, but also requiring a separate, sophisticated and expensive instrument. And since mass spectrometry-based proteomics is technologically driven, with the instrumentation and software constantly being improved, frequent upgrades to the current instrumentation will be required.

As the program of the MSPL expands, the need for support personnel will increase. It is expected that after the next five years, at least one technician will be required to provide adequate technical support and maintenance of the instrumentation.