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March 2010

To the Greater Kansas City Community:

We are pleased to provide the annual report of all extramural sponsored program activities for Fiscal Year 2009 (7/1/2008 – 6/30/2009) at the University of Kansas Medical Center (KUMC), which includes the School of Allied Health, the School of Medicine – Kansas City, the School of Medicine – Wichita, the School of Nursing, and the KUMC Research Institute, Inc.

This annual report presents to you the scope of research and other sponsored activities supported by the extramural funding community through grants, contracts and other mechanisms. It also includes awards received through the American Recovery and Reinvestment Act (ARRA) of 2009.

We would like to extend our thanks to all of those who have worked to provide the information contained in this report. A special thanks goes to the KUMC Office of Planning and Analysis for providing the statistics and report design.

The KUMC Research Institute, Inc. remains committed to the growth and development of the KUMC biomedical research enterprise through its support of its faculty and staff, and is an important partner in achieving the goals of the ten year strategic vision.

If you have questions regarding any information provided in the report, please contact the Research Institute at (913) 588-5436.

Sincerely,

Gregory S. Kopf, Ph.D.
Associate Vice Chancellor for Research Administration – KUMC
Executive Director – KUMC Research Institute, Inc.
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The University of Kansas Medical Center Research Institute, Inc. (KUMCRI) is a not-for-profit organization established to promote and support medical research. Created by the University of Kansas Medical Center (KUMC) in 1992, the Research Institute administers funded research projects on behalf of KUMC. The mission of KUMCRI is to support and enhance the research efforts of the KUMC faculty and staff for the benefit of the public.

The Research Institute’s objectives are to:

◊ Serve KUMC by promoting and operating at the highest level of administrative and financial honesty and integrity;
◊ Foster individual and consortia partnerships between KUMC researchers and national, regional, and local research bio-medical communities;
◊ Enhance revenue to researchers and the university through the transfer of research discoveries and other special information to the private sector; and
◊ Facilitate cooperative research interactions domestically and internationally between the KUMC and corporations, and with other research centers throughout Kansas, the greater Kansas City metropolitan area, nationally, and internationally.
Research Programs

Overview

Research programs at KUMC span a wide range of areas such as: aging, cancer, cardiovascular, child health and development, diabetes, host-pathogen interactions, integrative medicine, kidney/bone research, liver/gastroenterology, maternal/fetal biology, neuroscience, obesity, ophthalmology, orthopedics/bioengineering, personalized medicine(clinical pharmacology), public health, and reproductive sciences. The KUMCRI is in partnership with all of these programs.

Aging

The University of Kansas Medical Center faculty is engaged in research addressing a variety of problems related to aging, ranging from social concerns to cellular biology. Areas of research at the Landon Center on Aging include diseases of old age such as stroke and falls; health care technology as it pertains to the elderly, including mechanical, biomechanical, and biomedical engineering; social issues of aging such as the needs of caregivers and end of life issues; health policy and health services for the elderly; cognition and aging; brain plasticity and repair; and communication. These projects are conducted in an interdisciplinary setting. For example, the Brain Aging Project investigates a series of lifestyle issues that impact brain aging in addition to examining the structure of the brain itself and how it changes with age.

Cancer

Cancer research is the number one priority of the university and includes research directed at understanding the causes of cancer, providing clues regarding potential new forms of therapy, developing new therapeutics with enhanced efficacy and fewer side effects, and developing new cancer diagnostic and tumor imaging agents.

Cardiovascular

Research on the cardiovascular system includes basic studies related to adult stem cell-mediated repair of the infarcted heart; the role of cytokines and growth factors in cardiac remodeling; and protection of various organs against injuries sustained during cardiopulmonary arrest. In addition, several clinical studies are investigating the impact of lifestyle modification on cardiovascular outcomes, atrial fibrillation, and the utility of various echocardiographic parameters in the assessment of diastolic function.

Child Health and Development

Interdisciplinary faculty conduct research and provide clinical services related to the causes, characteristics, prevention and treatment of developmental disabilities in children. A major research emphasis is collaboration with community partners in developing and disseminating models that can be translated into community systems of care for these individuals. Faculty are also involved in interdisciplinary leadership training of graduate students and fellows to equip them for leadership positions in research, university teaching, and systems of care for children with developmental disabilities.
Diabetes

The mission of the KU Diabetes Institute is to promote optimal health and wellbeing through the diagnosis, treatment, cure and prevention of diabetes and its complications. The research component of the Institute is split into three divisions: 1) basic science aimed at discovering mechanisms; 2) healthcare delivery encompassing clinical outcomes, educational research and epidemiology; and 3) translational research focused on applying the basic and clinical studies to the clinic and/or community setting. Diabetes research ranges from basic and behavioral science fields to clinical outcomes research and translational research. Funded research includes basic and clinical aspects of diabetic neuropathy, islet cell transplant, diabetic heart disease, autoimmunity in diabetes, community prevention, and use of innovative technologies to treat diabetes.

Host-Pathogen Interactions

Research on the relationships between the host and a variety of microbial pathogens includes the identification of microbial virulence factors and the effects they have on immune recognition and pathogen clearance. Immunologists collaborate with those studying the pathogenesis of infectious diseases to characterize mechanisms of pathogen entry into the host, pathogen replication and the response the host makes to infection, including host cell death, the development of cancer, and the expression of protective immune mediators. The identification of microbial virulence factors and the definition of immune evasion mechanisms used by pathogens are important aspects of these research programs.

Integrative Medicine

This is an emerging program that investigates the effects of bioidentical ‘natural’ hormones on heart disease risk and associated parameters, as well as breast health, bone density and uterine morphology during menopause. Additional studies are examining the effects of intravenous vitamin C use during cancer chemotherapy and on the outcomes of treatment of hepatitis C.
**Kidney/Bone Research**

The Kidney Institute at the University of Kansas Medical Center performs research in several areas. Polycystic Kidney Disease (PKD) research is a major interest area that focuses on kidney cell proliferation with a long-term goal of finding a treatment for PKD that will alleviate the suffering of patients impacted by the disease. Researchers are studying molecular mechanisms of polycystin-1 and normal and abnormal development of the kidney. Researchers also study the metabolic regulation of minerals in bones and kidney.

**Liver/Gastroenterology**

Liver research at KUMC involves investigators from multiple basic and clinical departments who participate within the multidisciplinary Liver Center. Major research areas include toxic-, drug-, and alcohol-induced liver disease, viral hepatitis, liver cancer, coagulation disorders of the liver, and the biology of hepatic transport proteins. Active programs in drug discovery, cell signaling, nuclear receptor biology, epigenetics, pharmacogenetics, and metabolomics support these research areas. In addition, the Liver Center maintains a clinical tissue specimen bank for translational research in these areas. Clinical and translational research programs in Gastroenterology include strong programs in Barrett’s esophagus and gastrointestinal-esophageal reflux disease (GERD), GI cancer prevention, and advanced endoscopic techniques.

**Maternal/Fetal Biology**

Scientists in The Institute of Maternal Fetal Biology investigate genes and proteins and their involvement in regulating maternal adaptations to pregnancy, immunology, placental biology, and fetal development. Special topics of investigation include preeclampsia, early pregnancy loss, intrauterine growth restriction, blood cell formation in the fetus (anemias and thalassemias), sexual development, maternal substance abuse, factors leading to birth defects, pulmonary development, and mechanisms of lung injury.
**Neuroscience**

The Institute for Neurological Disorders was launched in March 2009 to promote neuroscience research aimed at preventing and curing neurological disease. Comprising some 120 basic and clinical neuroscientists with over $70M in funding, the Institute houses 6 divisions: Brain Injury and Repair, Neuromuscular and Movement Disorders, Neurodegenerative Disorders, Hearing and Equilibrium Disorders, Female Pain Syndromes, and Cognitive and Behavioral Disorders. These programs employ basic, clinical and translational research approaches to understanding a variety of diseases, including injury and stroke, autism, addiction, epilepsy, fibromyalgia, dementias, migraine, deafness, vertigo and multiple sclerosis.

**Obesity**

The Obesity program includes scientists at KU Medical Center, KU Lawrence, and Children’s Mercy Hospitals and Clinics. The Center focuses on reducing the regional and national epidemic of obesity in children and adults. Obesity causes and/or impacts all chronic diseases. Energy balance including nutrition and physical activity are the central components for weight management and reduction of health risk.

**Ophthalmology**

The Ophthalmology department has many active research programs, focused on improved diagnosis and treatment of diseases that threaten vision. Clinical research includes corneal and refractive surgery, neuro-ophthalmology and the functional consequences of age-related macular degeneration. Laboratory investigations are underway in retinal genetics, uveitis, uveal melanoma and neuro-protection in glaucoma. Plans are also underway to develop an Ophthalmic Bio-Engineering program in the near future. Research in this area is emerging around the concept of a Center for Ophthalmic Engineering with an emphasis on optics, refractive surgery, intraocular approaches and biomechanics of the eye.
Orthopedics/Bioengineering

The Orthopedic Research Center includes specimen dissection preparation, a machine shop, a wet lab, a biomechanical lab, a molecular biology lab, and a computer lab for computational biomechanical analysis. Molecular and cellular studies are identifying site-specific molecular targets regulating cartilage differentiation and the function of bone morphogenetic proteins. Additional studies include the role of bone sialoproteins in osteogenesis. Gait simulation research is directed at improving hip replacement procedures and walking.

Personalized Medicine (Clinical Pharmacology)

This program investigates novel methods to determine variations in drug metabolism by humans since not all people respond similarly to drugs. This research provides insights into potential drug interactions in patients that take multiple drugs, and on the effects of diet or supplements on drug metabolism.

Public Health

Our emerging program in public health research is tackling the greatest challenges to the health of our communities, addressing issues such as obesity, tobacco, cardiovascular disease, and cancer. Moreover, we are trying to tackle these issues in our most vulnerable communities, including rural, Native American, African American, and Latino communities.

Reproductive Sciences

Research at the University of Kansas Center for Reproductive Sciences includes the investigation of fertility, infertility, and diseases of the reproductive system. Knowledge of reproductive processes is gained through basic and clinical research encompassing a wide range of scientific and clinical pursuits. Specific focus areas include male fertility; female reproductive cycle; fertilization, implantation, and pregnancy; contraceptive development; analysis of complex neural networks controlling hormone secretion, reproduction, and behavior and; cancers of the reproductive system.
The 2008 Faculty Research Day took place on November 6, 2008. This program was initiated in 1982 with the intent of celebrating research at KUMC and recognizing the excellent work of the KUMC research community. This day provides researchers within KUMC an opportunity to share their work with other investigators and to hear research presentations by world-class scientists from within the Medical Center.

We take special pride in identifying those individuals who deserve special recognition for their research contributions. Individuals from the schools of Allied Health, Medicine and Nursing may be recognized in one of three categories:
The Chancellors Club Research Award is reserved for those KUMC faculty who are recognized leaders and who have achieved national and international stature in their chosen fields of research. Nominations are sent to the Vice Chancellor for Research Administration, a committee is selected to review the nominations and the final recommendation forwarded by the Vice Chancellor for Research to the Kansas University Endowment Association. This year’s recipient was Carol E. Smith, RN, PhD, School of Nursing.

Individuals receiving an Investigator Research Award are nominated by the KUMC faculty at large. Nominations are ranked by each schools research committee and then reviewed by Faculty Assembly Research Committee with recommendations to the Associate Vice Chancellor for Research Administration. Three faculty members received this award: Shilpa J. Buch, PhD, School of Medicine; Patricia S. Phol. PT, PhD, School of Allied Health; and Kristine Williams, RN, PhD, School of Nursing.

The Research Grant Administrator Award recognizes and honors significant administrative support of the research enterprise of the KUMC and Wichita campuses. Nominations are ranked by the division directors of the KUMC Research Institute with recommendations to the Associate Vice Chancellor for Research Administration. This year, Joanne McNair, Preventive Medicine and Lori Wade, External Affairs received the honors.

The Noffsinger Investigator Award is awarded to the individual who received the highest ranking in their application to the Lied Endowed Basic Science Program through the KUMC Research Institute. The mission of the Lied Basic Science Grant program is to develop new and innovative ideas that have a high probability of leading to the submission of a new application for national peer-reviewed funding. Congratulations to Navneet K. Dhillon, PhD, Molecular and Integrative Physiology.
Cayuse was adopted by the KUMC Research Institute in the Spring of 2009 for grant proposal preparation and system-to-system submission to the grants.gov website. Cayuse’s proposal development system has offered many advantages to the KUMC research community. One of the primary benefits of the system is the ability to share information between and within proposals. Institutional information and the PI profiles are stored in the system and automatically populated into the proposal. Budget information can be escalated throughout the proposal, eliminating manual calculations and the errors that can cause. Investigator specific information, such as Commons ID and biosketches, is saved within the system so it can be shared between investigators. Also, a completed proposal can be copied and transmitted into a different funding opportunity. The web-based system facilitates collaboration on proposals by allowing data integration between users both inside and outside of KUMC. Because the system was built specifically to interface with the grants.gov website, submitting proposals is both quick and secure. Errors and warnings are immediately identified for the user to take action before submission. Finally, information on new funding opportunities can be downloaded whenever it becomes available on the grants.gov website.

The University of Kansas Medical Center Research Institute introduced ECRT (Effort Certification and Reporting Technology), a new effort certification program, during the second half of FY 2009. This web-based system is very user friendly, leading certifiers and administrators through the certification process in a step-by-step manner. Replacing the existing paper system, ECRT computes paid effort within the limits of the NIH salary cap, includes retro-active funding adjustments in a timely manner, and displays committed effort with pay percentages. It also has numerous reports and opportunities for analysis at many levels. Due to its availability on the web, administrators can monitor paid effort as it is accumulated throughout the cycle, making corrective measures pro-actively rather than reactively. During the first certification cycle (January - June, 2009), there was a 95% certification rate, the most successful certification cycle experienced at KUMC.
American Recovery and Reinvestment Act (ARRA) of 2009

In response to the wide-spread economic recession experienced throughout the US, Congress passed a stimulus bill in 2009 aimed at creating new jobs and promoting economic activity. Known as the American Recovery and Reinvestment Act (ARRA), it has provided funds for education, health care and scientific research in the form of grants and contracts from various federal agencies. The faculty of the University of Kansas Medical Center took on the challenge to bring stimulus money to KUMC. As of October 31, 2009, $105,834,512 have been requested in 159 proposals. Table 1 shows which units requested ARRA moneys, a majority of which is from the National Institute of Health (NIH).

Table 1
Summary of ARRA Grants Submitted by School/Unit

<table>
<thead>
<tr>
<th>School/Unit</th>
<th># of Proposals</th>
<th>Total Amount of Award Requested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration</td>
<td>5</td>
<td>$12,252,293</td>
</tr>
<tr>
<td>School of Allied Health</td>
<td>2</td>
<td>$1,099,979</td>
</tr>
<tr>
<td>School of Medicine - Administration</td>
<td>1</td>
<td>$15,000,000</td>
</tr>
<tr>
<td>School of Medicine - Basic Sciences</td>
<td>71</td>
<td>$36,196,491</td>
</tr>
<tr>
<td>School of Medicine - Clinical Departments</td>
<td>49</td>
<td>$22,339,929</td>
</tr>
<tr>
<td>School of Medicine - Centers</td>
<td>20</td>
<td>$12,071,977</td>
</tr>
<tr>
<td>School of Medicine - Wichita</td>
<td>5</td>
<td>$4,722,830</td>
</tr>
<tr>
<td>School of Nursing</td>
<td>6</td>
<td>$2,151,013</td>
</tr>
</tbody>
</table>
OVERVIEW OF ACTIVITY

Awards

In FY 2009, extramural awards (all sources) totaled $98,059,379, an increase of $109,686 (0.1%) from FY 2008’s total of $97,949,693.

Total awards for the KUMC schools for FY 2009 were: School of Medicine - $77,811,565 (School of Medicine – Kansas City totaled $75,887,551 and School of Medicine – Wichita’s awards totaled $1,924,014), School of Allied Health - $2,405,180, and School of Nursing - $5,711,614.

Six departments each received awards totaling over $5 million in FY 2009.

Eighteen principal investigators each received awards totaling over $1 million in FY 2009.

In FY 2009, the Research Institute managed a total of 725 grants and clinical trials, an increase of 5.2% from the 689 managed in FY 2008.
Expenditures

Total extramural expenditures for FY 2009 were $93,127,916, an increase of 10.3% from the $84,408,913 expended in FY 2008.

Expenditures on federally funded projects increased 7.4% from $62.8M in FY 2008 to $67.4M in FY 2009. This is despite a decrease in federal project expenditures as a proportion of all Medical Center research expenditures, which dropped from 74% of all expenditures in FY 2008 to 72% of all expenditures in FY 2009.

In the categories of personnel salaries, equipment, travel, and other costs, expenditures in FY 2009 were above those in FY 2008. Expenditures on supplies, sub-awards, and trainee costs were down in FY 2009 from FY 2008.
EXTRAMURAL AWARDS
In FY 2009, extramural awards (all sources including KUEA funds) totaled $98,059,379, an increase of $109,686 (0.1%) from $97,949,693 in FY 2008. Total extramural grant awards decreased $2,065,766 (2.5%) during this period from $82,941,681 to $80,875,915. Clinical Trials revenue increased by $1,220,158 (15.9%) from $7,687,796 in FY 2008 to $8,907,954 in FY 2009. Revenues from Technology Development & Commercialization increased by $377,854 (171%) from $220,434 to $598,288. Other sources from the Wichita Medical Practice Association and the KU Endowment Association increased from $7,099,782 in FY 2008 to $7,677,222 in FY 2009, a growth of $577,440 (8.1%). (See Figure 1 below and Table 2, next page)

**Figure 1**
FY 2008 and FY 2009 Extramural Award Summary (Million $)

**Table 2**
Summary of Awards from All Sources for FY 2008 – FY 2009

<table>
<thead>
<tr>
<th>Source of Extramural Funding</th>
<th>FY 2009 ($)</th>
<th>FY 2008 ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>KUMC Research Institute Managed</td>
<td>90,382,157</td>
<td>90,849,911</td>
</tr>
<tr>
<td>Grants</td>
<td>80,875,915</td>
<td>82,941,681</td>
</tr>
<tr>
<td>Clinical Trials</td>
<td>8,907,954</td>
<td>7,687,796</td>
</tr>
<tr>
<td>Technology Development &amp; Commercialization</td>
<td>598,288</td>
<td>222,434</td>
</tr>
<tr>
<td>Other Sources of Extramural Funding</td>
<td>7,677,222</td>
<td>7,099,782</td>
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<tr>
<td>KU Endowment Association</td>
<td>6,375,754</td>
<td>5,786,112</td>
</tr>
<tr>
<td>Allied Health</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Medicine</td>
<td>6,362,727</td>
<td>5,320,112</td>
</tr>
<tr>
<td>Nursing</td>
<td>13,027</td>
<td>466,000</td>
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<td>Medical Practice Association – Wichita</td>
<td>1,301,468</td>
<td>1,313,670</td>
</tr>
<tr>
<td>Grants</td>
<td>1,292,698</td>
<td>1,243,761</td>
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<tr>
<td>Clinical Trials</td>
<td>8,770</td>
<td>19,909</td>
</tr>
<tr>
<td>Total of All Awards</td>
<td>98,059,379</td>
<td>97,949,693</td>
</tr>
</tbody>
</table>
In FY 2009, funding from all agencies totaled $98,059,379 an increase of $109,686 (0.1%) from $97,949,693 in FY 2008. NIH funding increased by $865,469 (1.6%) during this period from $55,583,303 to $56,428,772. Decreases from FY 2008 to FY 2009 were seen in some sponsor groups. Non-NIH federal funding decreased by $2,550,671 (17%) from $15,038,291 in FY 2008 to $12,487,620 in FY 2009. Award funding from the state of Kansas decreased to $705,038 in FY 2009 (77%) from the $3,056,505 awarded in FY 2008. In contrast, funding from the KU Endowment and the Wichita Medical Practice Association increased by $577,440 (8.1%); private award funding increased by $2,553,653 (21.6%); and clinical trial revenue increased by $1,034,918 (19.4%). Details of FY 2009 departmental awards by funding agency is presented in Table 3.

Figure 2
FY 2008 and FY 2009 Awards by Funding Agency Type (Million $)

<table>
<thead>
<tr>
<th>FY 2009</th>
<th>FY 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>$12.5M from Non-NIH Federal Agencies (12.8%)</td>
<td>$15.0M from Non-NIH Federal Agencies (15.4%)</td>
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<tr>
<td>$14.4M from Private Sponsors (14.7%)</td>
<td>$11.8M from Private Sponsors (12.1%)</td>
</tr>
<tr>
<td>$7.7M from KU Clinical Foundations and Endowment (7.8%)</td>
<td>$7.1M from KU Clinical Foundations and Endowment (7.2%)</td>
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<tr>
<td>$6.4M from Clinical Trials (6.5%)</td>
<td>$5.3M from Clinical Trials (5.4%)</td>
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<td>$0.7M from the State of Kansas (0.7%)</td>
<td>$3.1M from the State of Kansas (3.1%)</td>
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<td>$56.4M from NIH (57.5%)</td>
<td>$55.6M from NIH (56.8%)</td>
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<td>Department</td>
<td>National Institutes of Health</td>
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<td>------------------------------------------------</td>
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<tr>
<td>KUMC Administration</td>
<td>$881,938</td>
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<td>Center for Environmental and Occupational Health</td>
<td>$39,106</td>
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<td>Center for Telemedicine &amp; Telehealth</td>
<td>$748,203</td>
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<tr>
<td>Continuing Education</td>
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<tr>
<td>Dykes Library</td>
<td>$1,962</td>
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<tr>
<td>Medical Center Police</td>
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<tr>
<td>Research Administration</td>
<td>$3,238,288</td>
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<tr>
<td>Student Services</td>
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<tr>
<td>School of Allied Health</td>
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<tr>
<td>Clinical Laboratory Sciences</td>
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<tr>
<td>Dietetics &amp; Nutrition</td>
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<td>Hearing &amp; Speech</td>
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<td>Nurse Anesthesia Education</td>
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<td>Basic Science Departments</td>
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<td>School of Allied Health</td>
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<tr>
<td>Clinical Departments</td>
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<tr>
<td>Anatomy &amp; Cell Biology</td>
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<td>Biochemistry &amp; Molecular Biology</td>
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<td>Health Policy &amp; Management</td>
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<td>Microbiology, Molecular Genetics &amp; Immunology</td>
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<td>Molecular &amp; Integrative Physiology</td>
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<tr>
<td>Pharmacology, Toxicology, &amp; Therapeutics</td>
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<td>Preventive Medicine</td>
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<td>Internal Medicine - Wichita</td>
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<td>Obstetrics &amp; Gynecology - Wichita</td>
<td>$181,302</td>
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<tr>
<td>Preventive Medicine - Wichita</td>
<td>$721,709</td>
</tr>
<tr>
<td>Psychiatry - Wichita</td>
<td>$61,770</td>
</tr>
<tr>
<td>School of Allied Health</td>
<td>$1,618,247</td>
</tr>
<tr>
<td>Other Sources of Extramural Funding</td>
<td>$7,668,452</td>
</tr>
<tr>
<td>KU Endowment Association</td>
<td>$6,375,754</td>
</tr>
<tr>
<td>Medical Practice Association - Wichita</td>
<td>$1,292,698</td>
</tr>
<tr>
<td>Total</td>
<td>$56,428,772</td>
</tr>
</tbody>
</table>
FY 2009 Awards by School

School of Medicine

Awards for the School of Medicine for FY 2009 totaled $77,811,565, a 3.9% increase from the $74,923,514 awarded in FY 2008 (see Figure 3).

Figure 3. School of Medicine Awards for FY 2009 by Grants and Clinical Trials (Million $)

![Pie chart showing the distribution of awards among different categories: Basic Sciences Grants ($36.7M, 47.3%), Clinical Trials ($6.0M, 7.7%), Wichita Campus ($1.9M, 2.5%), Clinical Departments Grants ($20.8M, 26.7%), Centers Grants ($12.3M, 15.8%), Centers Clinical Trials ($1.0M, 1.3%), Clinical Dept. Clinical Trials ($0.0M, 0%).]

Research grant awards for FY 2009 for the School of Medicine’s Kansas City Campus had a total dollar value of $75,887,551, a 3.1% increase from the $73,619,724 awarded for FY 2008 (see Figure 4).

Figure 4. School of Medicine - KC Awards for FY 2000 - FY 2009 (Million $)

![Bar chart showing the awards for different fiscal years (2000-2009): $38.6M, $39.2M, $52.5M, $54.5M, $62.6M, $62.1M, $71.4M, $75.0M, $73.6M, $75.9M.]

Awards for the School of Medicine’s Wichita Campus totaled $1,924,014 for FY 2009, a 48% increase from the $1,303,790 in awards for FY 2008 (see Figure 5).

Figure 5. School of Medicine - Wichita Awards for FY 2000 - FY 2009 (Million $)

![Bar chart showing the awards for different fiscal years (2000-2009): $0.8M, $1.1M, $1.1M, $1.3M, $1.6M, $1.2M, $1.5M, $1.1M, $1.3M, $1.9M.]

**School of Allied Health**

Total awards for the School of Allied Health in FY 2009 were $2,405,180, a 4.6% increase from the $2,301,436 awarded in FY 2008 (see Figure 6).

![Figure 6. School of Allied Health Awards for FY 2000 - FY 2009 (Million $)](image)

**School of Nursing**

Total awards for the School of Nursing in FY 2009 were $5,711,614, a 7.9% decrease from the $6,194,332 in awards for FY 2008 (see Figure 7).

![Figure 7. School of Nursing Awards for FY 2000 - FY 2009 (Million $)](image)
Twenty-two departments had at least $1 million in FY 2009 awarded dollars. The top four departments account for $31.6 million in awards: Anatomy & Cell Biology ($10.5M); Internal Medicine ($8.2M); Preventive Medicine ($6.4M); and Pharmacology, Toxicology, and Therapeutics ($6.4M) (Table 4).

### Table 4

**Departments, Center and Institutes with Highest Total Award Dollars in FY2009**

<table>
<thead>
<tr>
<th>Departments</th>
<th>Grants</th>
<th>Clinical Trials</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anatomy &amp; Cell Biology</td>
<td>$10,513,956</td>
<td></td>
<td>$10,513,956</td>
</tr>
<tr>
<td>Internal Medicine</td>
<td>$4,812,842</td>
<td>$3,404,341</td>
<td>$8,217,183</td>
</tr>
<tr>
<td>Preventive Medicine</td>
<td>$6,420,576</td>
<td>$19,125</td>
<td>$6,439,701</td>
</tr>
<tr>
<td>Pharmacology, Toxicology, &amp; Therapeutics</td>
<td>$6,389,496</td>
<td></td>
<td>$6,389,496</td>
</tr>
<tr>
<td>Molecular &amp; Integrative Physiology</td>
<td>$5,867,509</td>
<td></td>
<td>$5,867,509</td>
</tr>
<tr>
<td>School of Nursing</td>
<td>$5,711,614</td>
<td></td>
<td>$5,711,614</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>$4,353,347</td>
<td>$137,090</td>
<td>$4,490,437</td>
</tr>
<tr>
<td>Pathology &amp; Laboratory Sciences</td>
<td>$4,235,865</td>
<td>$12,561</td>
<td>$4,248,426</td>
</tr>
<tr>
<td>Microbiology, Molecular Genetics &amp; Immunology</td>
<td>$4,041,543</td>
<td></td>
<td>$4,041,543</td>
</tr>
<tr>
<td>Neurology</td>
<td>$963,156</td>
<td>$2,722,820</td>
<td>$3,685,976</td>
</tr>
<tr>
<td>Biochemistry</td>
<td>$3,312,889</td>
<td></td>
<td>$3,312,889</td>
</tr>
<tr>
<td>Research Administration</td>
<td>$3,238,288</td>
<td>$32,760</td>
<td>$3,271,048</td>
</tr>
<tr>
<td>Center on Aging</td>
<td>$2,487,357</td>
<td></td>
<td>$2,487,357</td>
</tr>
<tr>
<td>General Clinical Research Center</td>
<td>$2,233,093</td>
<td></td>
<td>$2,233,093</td>
</tr>
<tr>
<td>Kidney Institute</td>
<td>$2,043,073</td>
<td></td>
<td>$2,043,073</td>
</tr>
<tr>
<td>Kansas Intellectual &amp; Developmental Disabilities Research Center</td>
<td>$1,928,732</td>
<td></td>
<td>$1,928,732</td>
</tr>
<tr>
<td>Dietetics &amp; Nutrition</td>
<td>$1,548,283</td>
<td>$290,378</td>
<td>$1,838,661</td>
</tr>
<tr>
<td>Cancer Center</td>
<td>$561,212</td>
<td>$862,631</td>
<td>$1,423,843</td>
</tr>
<tr>
<td>Hoglund Brain Imaging Center</td>
<td>$1,403,538</td>
<td></td>
<td>$1,403,538</td>
</tr>
<tr>
<td>Center for Child Health &amp; Development</td>
<td>$1,394,659</td>
<td></td>
<td>$1,394,659</td>
</tr>
<tr>
<td>Family Medicine</td>
<td>$1,360,653</td>
<td></td>
<td>$1,360,653</td>
</tr>
<tr>
<td>Preventive Medicine - Wichita</td>
<td>$1,253,075</td>
<td></td>
<td>$1,253,075</td>
</tr>
<tr>
<td>Otorhinolaryngology</td>
<td>$918,720</td>
<td>$70,175</td>
<td>$988,895</td>
</tr>
<tr>
<td>Center for Telemedicine &amp; Telehealth</td>
<td>$961,168</td>
<td></td>
<td>$961,168</td>
</tr>
<tr>
<td>Obstetrics &amp; Gynecology</td>
<td>$833,379</td>
<td>$127,285</td>
<td>$960,664</td>
</tr>
<tr>
<td>Psychiatry &amp; Behavioral Sciences</td>
<td>$240,463</td>
<td>$714,790</td>
<td>$955,253</td>
</tr>
<tr>
<td>Other</td>
<td>$2,445,717</td>
<td>$513,998</td>
<td>$2,959,715</td>
</tr>
</tbody>
</table>
Eighteen principal investigators had total award dollars over $1 million for FY 2009, including five principal investigators with total extramural funds in excess of $3 million (Joan Hunt, Richard Barohn, Martha Staker, Curtis Klaassen, and Nancy Dunton). These principal investigators and their total award amounts are listed in Figure 8.

The fourteen principal investigators with Department of Health and Human Services (DHHS) award dollars totaling at least $1 million who are listed in Figure 8.

**Figure 8**
Principal Investigators with FY 2009 Awards Over $1 M
**Awards (Grants and Clinical Trials) Managed in FY 2009**

The Research Institute managed 686 grants and 560 clinical trials (total of 1,246 active awards) during FY 2009. Table 5 shows the number of grants and clinical trials managed by departments (for departments with 10 or more managed grants). Two departments lead in terms of managed awards, Internal Medicine (269) and Neurology (163). The 28 departments with the highest number together account for 92% (1,153) of all managed awards. The remaining 30 departments together account for a total of 72 active grants and 21 clinical trials.

**Table 5**

Grants and Clinical Trials Managed by the Research Institute During FY 2009 by Department

<table>
<thead>
<tr>
<th>Departments</th>
<th>Grants</th>
<th>Clinical Trials</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Medicine</td>
<td>61</td>
<td>208</td>
<td>269</td>
</tr>
<tr>
<td>Neurology</td>
<td>28</td>
<td>135</td>
<td>163</td>
</tr>
<tr>
<td>Cancer Center</td>
<td>14</td>
<td>64</td>
<td>78</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>40</td>
<td>24</td>
<td>64</td>
</tr>
<tr>
<td>Pharmacology, Toxicology, &amp; Therapeutics</td>
<td>53</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>Molecular &amp; Integrative Physiology</td>
<td>49</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>Anatomy &amp; Cell Biology</td>
<td>47</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>School of Nursing</td>
<td>40</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Pathology &amp; Laboratory Sciences</td>
<td>33</td>
<td>3</td>
<td>36</td>
</tr>
<tr>
<td>Preventive Medicine</td>
<td>34</td>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td>Mid America Cardiology</td>
<td>2</td>
<td>30</td>
<td>32</td>
</tr>
<tr>
<td>Preventive Medicine - Wichita</td>
<td>27</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>Center on Aging</td>
<td>23</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Biochemistry</td>
<td>22</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Surgery General</td>
<td>7</td>
<td>15</td>
<td>22</td>
</tr>
<tr>
<td>Psychiatry &amp; Behavioral Sciences</td>
<td>5</td>
<td>17</td>
<td>22</td>
</tr>
<tr>
<td>Microbiology, Molecular Genetics &amp; Immunology</td>
<td>21</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Hoglund Brain Imaging Center</td>
<td>20</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Obstetrics &amp; Gynecology</td>
<td>6</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>Dietetics &amp; Nutrition</td>
<td>12</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Kidney Institute</td>
<td>12</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>Center for Child Health &amp; Development</td>
<td>13</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>Surgery Neurosurgery</td>
<td>1</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Center for Telemedicine &amp; Telehealth</td>
<td>12</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Family Medicine</td>
<td>12</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Surgery Urology</td>
<td>8</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>Physical Therapy Rehabilitation Sciences</td>
<td>8</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Otorhinolaryngology</td>
<td>4</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Other</td>
<td>72</td>
<td>21</td>
<td>93</td>
</tr>
</tbody>
</table>
NIH Rankings

The latest available NIH rankings are for FY 2008. NIH rankings for the three KUMC schools for FY 2002 - FY 2008 compared with all schools in those categories, public and private, are depicted in Table 6. (Note: All figures listed below reflect the Federal Fiscal Year, which runs from October 1 through September 30. KUMC’s Fiscal Year is from July 1 through June 30.)

NIH rankings for FY 2008 for KUMC are as follows:

- The KUMC School of Allied Health ranked 12th among 49 schools of allied health with $1.25M from six NIH awards.
- The KUMC School of Medicine ranked 65th among 125 schools of medicine with $44.7M from one hundred ten NIH awards.
- The KUMC School of Nursing ranked 31st among 82 schools of nursing with $1.45M from three NIH awards.

Table 6
NIH Ranking by School, Federal FY 2002-FY 2008

<table>
<thead>
<tr>
<th>School of Allied Health</th>
<th>Total # of NIH Awards</th>
<th>Total NIH $ Awarded (Millions)</th>
<th>School Rank (All Institutions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>1</td>
<td>0.25</td>
<td>26</td>
</tr>
<tr>
<td>2003</td>
<td>4</td>
<td>0.57</td>
<td>15</td>
</tr>
<tr>
<td>2004</td>
<td>5</td>
<td>0.60</td>
<td>17</td>
</tr>
<tr>
<td>2005</td>
<td>6</td>
<td>1.05</td>
<td>14</td>
</tr>
<tr>
<td>2006</td>
<td>7</td>
<td>1.61</td>
<td>8</td>
</tr>
<tr>
<td>2007</td>
<td>6</td>
<td>2.06</td>
<td>7</td>
</tr>
<tr>
<td>2008</td>
<td>3</td>
<td>1.25</td>
<td>12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>School of Medicine</th>
<th>Total # of NIH Awards</th>
<th>Total NIH $ Awarded (Millions)</th>
<th>School Rank (All Institutions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>99</td>
<td>34.8</td>
<td>73</td>
</tr>
<tr>
<td>2003</td>
<td>95</td>
<td>36.5</td>
<td>74</td>
</tr>
<tr>
<td>2004</td>
<td>84</td>
<td>34.3</td>
<td>77</td>
</tr>
<tr>
<td>2005</td>
<td>85</td>
<td>33.4</td>
<td>81</td>
</tr>
<tr>
<td>2006</td>
<td>95</td>
<td>36.9</td>
<td>75</td>
</tr>
<tr>
<td>2007</td>
<td>110</td>
<td>45.4</td>
<td>68</td>
</tr>
<tr>
<td>2008</td>
<td>114</td>
<td>44.7</td>
<td>65</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>School of Nursing</th>
<th>Total # of NIH Awards</th>
<th>Total NIH $ Awarded (Millions)</th>
<th>School Rank (All Institutions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>3</td>
<td>1.28</td>
<td>33</td>
</tr>
<tr>
<td>2003</td>
<td>4</td>
<td>1.67</td>
<td>24</td>
</tr>
<tr>
<td>2004</td>
<td>4</td>
<td>1.49</td>
<td>29</td>
</tr>
<tr>
<td>2005</td>
<td>3</td>
<td>0.92</td>
<td>40</td>
</tr>
<tr>
<td>2006</td>
<td>6</td>
<td>2.17</td>
<td>19</td>
</tr>
<tr>
<td>2007</td>
<td>3</td>
<td>1.31</td>
<td>34</td>
</tr>
<tr>
<td>2008</td>
<td>3</td>
<td>1.45</td>
<td>31</td>
</tr>
</tbody>
</table>
Total Extramural Expenditures

Total extramural expenditures for FY 2009 were $93,127,916, an increase of 10.3% from the $84,408,913 expended in FY 2008. (See Figure 9) Expenditures have doubled in the ten years since FY 2000. (Note: These amounts include funds on deposit with the Research Institute and KUMC, but do not include other Institution expenditures.)

Expenditures by Funding Source

Expenditures have been separated by sponsor into four categories: federal, state, industry, and non-profit. Expenditures from federal funding have grown 129% from $29.4M in FY 2000 to $67.4M in FY 2009. Expenditures from non-profit funding have grown 359% in that same time from $4.6M in FY 2000 to $21.2M in FY 2009. Meanwhile, expenditures from state funding have dropped 91% and from industry funding have dropped 47%. Table 7 shows total extramural expenditures by funding source for the ten years ending with FY 2009.

Table 7
Total Extramural Expenditures by Funding Sources, FY 2000-FY 2009 (Thousand $)

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Federal Government</th>
<th>State &amp; Local Government</th>
<th>Industry</th>
<th>Not-for-Profit &amp; Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>67,420</td>
<td>316</td>
<td>4,190</td>
<td>21,201</td>
<td>93,128</td>
</tr>
<tr>
<td>2008</td>
<td>62,765</td>
<td>592</td>
<td>5,019</td>
<td>16,033</td>
<td>84,409</td>
</tr>
<tr>
<td>2007</td>
<td>60,653</td>
<td>94</td>
<td>5,532</td>
<td>14,109</td>
<td>80,388</td>
</tr>
<tr>
<td>2006</td>
<td>58,785</td>
<td>126</td>
<td>5,452</td>
<td>10,201</td>
<td>74,563</td>
</tr>
<tr>
<td>2005</td>
<td>59,176</td>
<td>34</td>
<td>5,273</td>
<td>7,696</td>
<td>72,089</td>
</tr>
<tr>
<td>2004</td>
<td>56,997</td>
<td>201</td>
<td>3,761</td>
<td>9,862</td>
<td>70,801</td>
</tr>
<tr>
<td>2003</td>
<td>49,863</td>
<td>2,639</td>
<td>5,461</td>
<td>8,599</td>
<td>66,562</td>
</tr>
<tr>
<td>2002</td>
<td>40,865</td>
<td>3,391</td>
<td>3,573</td>
<td>9,190</td>
<td>57,019</td>
</tr>
<tr>
<td>2001</td>
<td>35,338</td>
<td>2,890</td>
<td>1,589</td>
<td>8,782</td>
<td>48,599</td>
</tr>
<tr>
<td>2000</td>
<td>29,389</td>
<td>3,564</td>
<td>7,861</td>
<td>4,615</td>
<td>45,429</td>
</tr>
</tbody>
</table>
Federal funds comprised 72.3% of the total extramural expenditures for FY 2009. This percentage has generally increased between FY 2000 and FY 2005, but has declined in the four most recent fiscal years as KUMC has broadened its sources of support. See Figure 10, below.

**Figure 10**
Federal Funds as a Percent of Total Extramural Expenditures, FY 2000 - FY 2009

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Funds</td>
<td>$29.4M</td>
<td>$35.5M</td>
<td>$40.9M</td>
<td>$49.9M</td>
<td>$52.0M</td>
<td>$59.2M</td>
<td>$58.8M</td>
<td>$60.7M</td>
<td>$62.8M</td>
<td>$67.4M</td>
</tr>
<tr>
<td>Total Expenditures</td>
<td>$45.4M</td>
<td>$48.6M</td>
<td>$57.0M</td>
<td>$66.6M</td>
<td>$70.8M</td>
<td>$72.1M</td>
<td>$74.0M</td>
<td>$80.4M</td>
<td>$84.4M</td>
<td>$93.1M</td>
</tr>
</tbody>
</table>

**Direct and Indirect Costs**

For FY 2009, direct costs totaled $73,267,673 (79%) and indirect costs totaled $19,860,243 (21%).

The categories of direct costs are detailed in Figure 11. Personnel costs accounted for over half (59%) of direct expenditures in FY 2009. Supplies, sub-awards, equipment, travel, and trainee costs accounted for 25% (10%, 8%, 4%, 2%, and 1%, respectively). A variety of other costs comprised the remaining 16%.

**Figure 11**
FY 2009 Direct Costs by Category (Millions $)