Public Policy and Research at The University of Kansas Medical Center

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Public policy has a major impact on research direction at The University of Kansas Medical Center (KUMC). In the past three years, KUMC research leadership has focused on developing programs that are in accord with the aims and goals of (1) world leaders, (2) agencies in the United States that support biomedical research, (3) the State of Kansas, (4) the Kansas City region, and (5) The University of Kansas Medical Center.

World leaders recognize that with the explosive growth in populations, particularly in third world countries, it is incumbent on scientists in developed countries to expand and refine economic and scientific strategies for improving human health. In the U.S., this is reflected in increased support each year for both discovery research and translational research; under National Institutes of Health (NIH) Director E. Zerhouni the emphasis is on translational research. Other agencies with this outlook are the National Science Foundation (NSF) and the U.S. Department of Agriculture.

The State of Kansas is concerned with the health of its citizens, but is also interested in driving the state economy forward by supporting commercialization of discoveries. The Kansas Economic Growth Act (KEGA) is one of the major outcomes of this emphasis on commercialization. This legislation was designed to facilitate the transfer of new developments in research into technology and commercial development in Kansas companies. Its design was driven by the Kansas Technology Enterprise Corporation (KTEC) and now also is a focus of KansasBio, a new organization of Kansas businessmen and academic representatives. Finally, regional support for biomedical research has been building for the past four to five years under the umbrella of the Kansas City Area Life Sciences Initiative, which works with academic institutions and area businesses to bring economic growth to the region through utilization of discoveries in basic and clinical research laboratories.

At KUMC, remaining competitive means staying in accord with funding goals of the NIH; this is critical because the institution receives an additional 47% for facilities and administration in addition to direct research awards and these funds cover many KUMC needs. Commercialization has additional potential for supporting the costs of running the institution.

Raising the question

The drive to use biomedical researchers and their products to increase commercial development is clearly changing the face of research; this raises the question of whether this is beneficial for the future. Will such directives improve or impede discoveries that will lead to improvements in human health and advance research in all fields? The traditional investigator-initiated approach where researchers designed the goals and worked to learn more about how organisms function so as to improve human health is quickly being replaced with the top-down goal of finding uses for research discoveries that will benefit economic growth.

Many researchers are falling agreeably into the new pattern. There are at least two reasons why this is the case. First, biomedical researchers are strongly committed to improvements in human health and would like to see their work bring better health care. Second, because of top-down direction, researchers must now focus on translational aspects of their work in order to win research funding to support their ventures into discovery biomedical research.

The major point of the graph below is that states supply little total support (2%), while most (63%) is contributed by government grants and contracts. Because of the decision by governments that translational research is now the major goal, this drives the aims and goals of research submitted by public agencies. This profile applies to KUMC research, where the university and state contribute little funding to research while strong emphasis is placed on acquisition of extramural funding.

Sources of funding for research: the influence of funding agencies

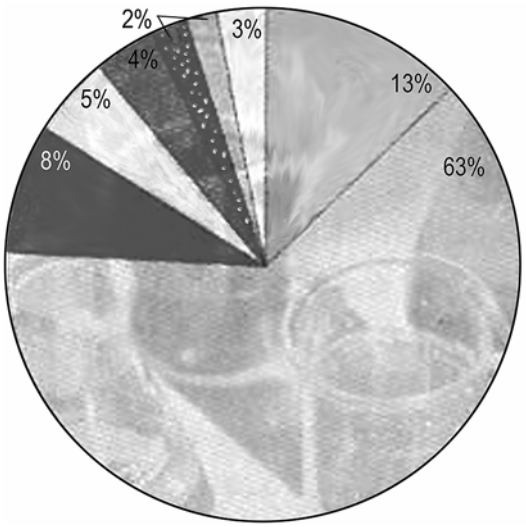


Fig. 1. Funding sources for research at U.S. medical schools and universities

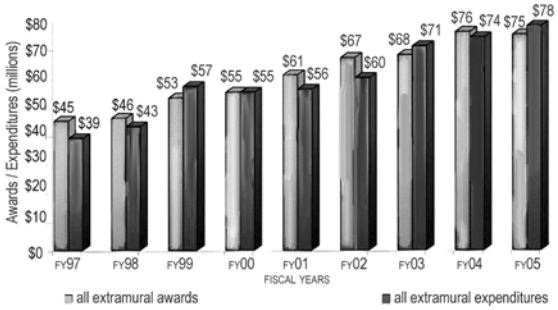
(From *Characteristics of Research Centers and Institutes at U.S. Medical Schools and Universities*, 2005, American Association of Medical Colleges.)

government grants & contracts 63%
university funds 13%
private foundations 8%
industry/corporate funding 5%
endowment 4%
patient care services 2%
direct state funds 2%
other resources 3%

KUMC success in extramural research support

KUMC has competed effectively for extramural research awards. As shown in Figure 2, awards and consequent expenditures have increased each year such that in the eight years from 1997 to 2005 expenditures have nearly doubled. These increases can be attributed not only to exceptional efforts by KUMC researchers, but also to (1) the doubling of the NIH budget that occurred from 1999 to 2003 and (2) infusion of funds from a program carried out by the National Center for Research Resources (NCRR) called the IDeA program, which was established to increase the competitiveness of researchers in the lower half of NIH funding.

Figure 2. KUMC Extramural Funding

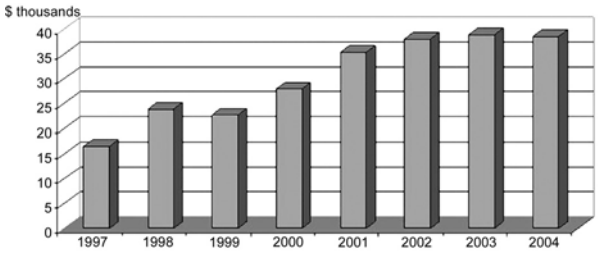


(Note that awards and expenditures do not match exactly; investigators reserve funds for later use.)

Figure 3 shows that KUMC researchers have responded to the directions from the NIH and have received the increases in NIH awards that have occurred in this time period across the U.S. Half of all extramural research awards to KUMC now are NIH awards.

Clinical trials at KUMC are increasing dramatically. In fiscal year '04 there were 85 investigators involved in 260 trials; in FY'05, 111 investigators conducted 393 trials. These trials, which are mainly funded by pharmaceutical and surgical device companies, compose most of the non-NIH research income that is shown in Figure 2.

Figure 3. Growth in KUMC NIH awards



Total DC + F&A NIH awards to KUMC

KUMC basic science departments in the School of Medicine have competed more effectively for the NIH-mandated initiatives than have the clinical departments. As shown in Figure 4, the Departments of Anatomy and Cell Biology; Molecular and Integrative Physiology; and Microbiology, Molecular Genetics and Immunology are strong contenders. By contrast, as Figure 5 shows, only the Department of Medicine among the clinical departments has acquired significant NIH support.

This less-than-satisfactory effort from clinical departments despite the emphasis on translational research followed by commercialization that is now mandated by NIH is believed to be due to several factors, including increased clinical demands to finance physician and support staff salaries. In the past, KUMC did not have a clinical research center. This year a General Clinical Research Center was opened under the direction of Dr. R. Barohn that should facilitate high quality, NIH-supported clinical research.

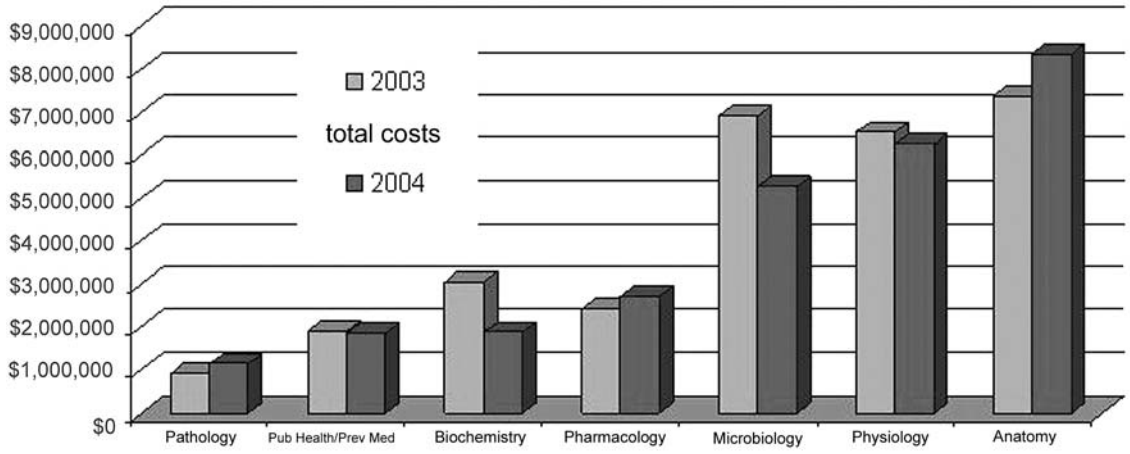


Figure 4. NIH awards to KUMC basic science departments

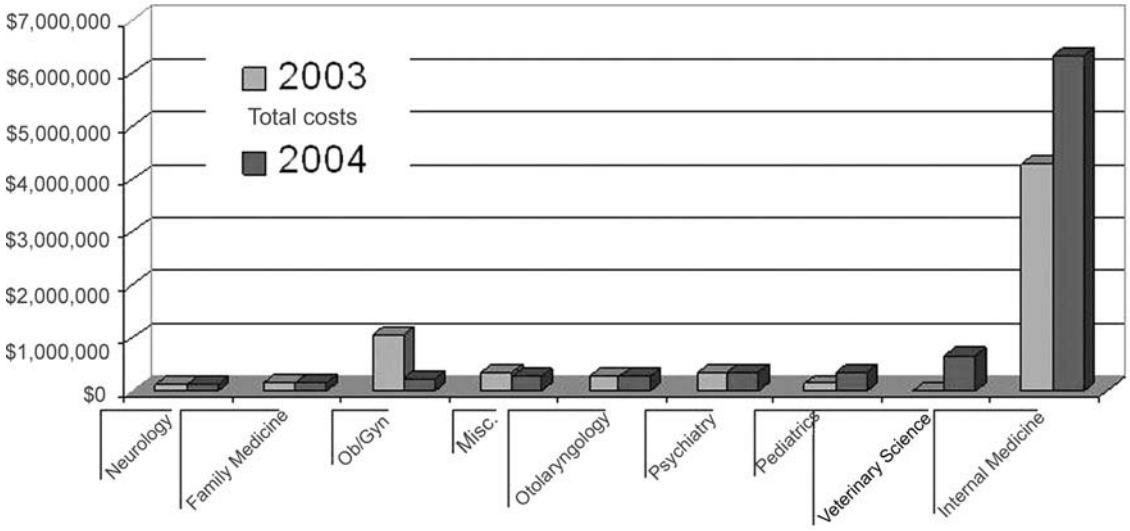


Figure 5. NIH awards to KUMC clinical departments

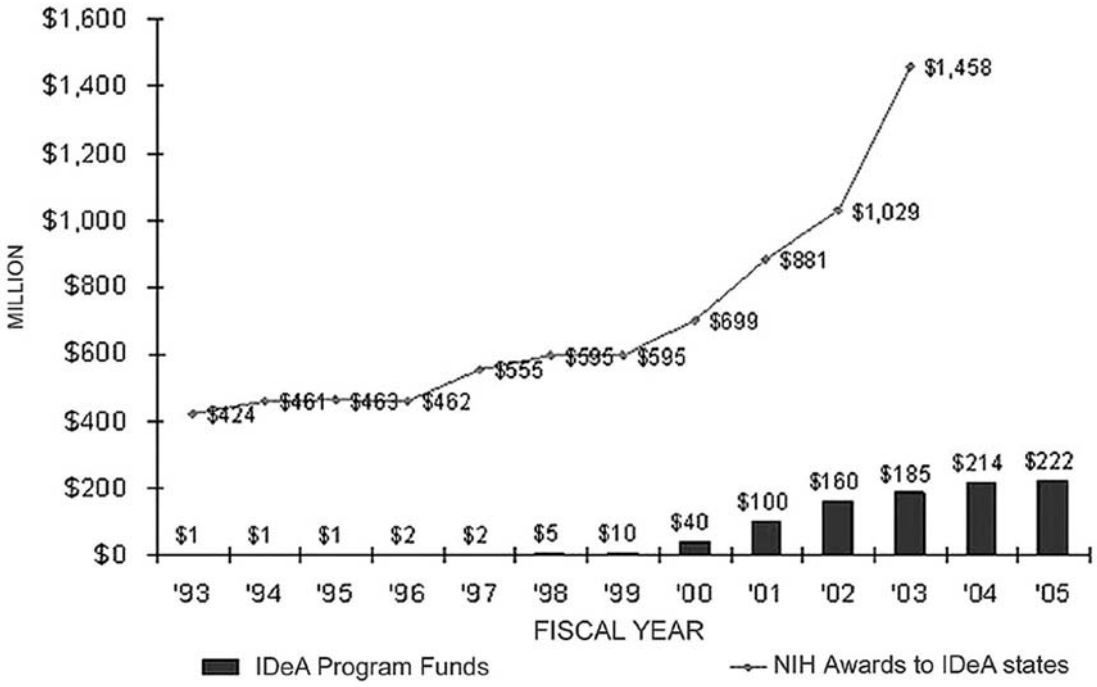


Figure 6. IDeA state NIH awards grow faster than the IDeA award program

KUMC Schools of Nursing and Allied Health compete effectively

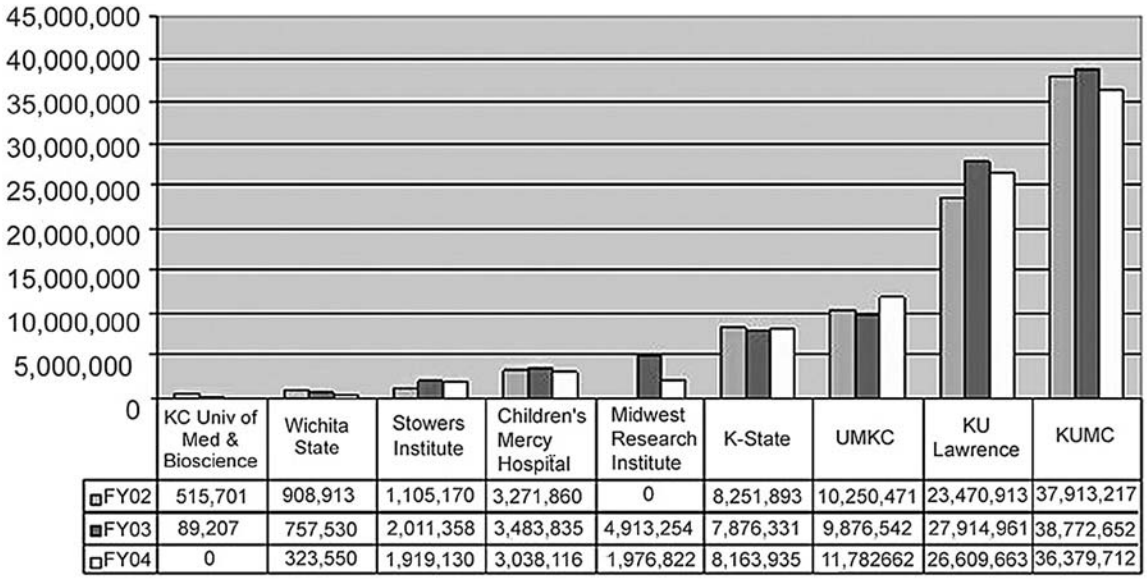
Translational research is well supported in the other two schools at KUMC. Although the NIH research awards are low in the Schools of Nursing ($1,489,000, 2004) and Allied Health ($600,000, 2004) in comparison with the School of Medicine ($34,292,000, 2004), KU Nursing has risen from a ranking of 30 in the list of public universities in 2001 to 20 in 2004 and KU Allied Health has risen from 19 to 13 during the same time period. By contrast, the School of Medicine rank declined between 2001 (43rd) and 2004 (48th).

Although it could be argued that the IDeA program supported by NCRR is largely responsible for the growth in KUMC NIH awards, this is not entirely the case. As shown in Figure 6, IDeA funds have contributed substantially to growth of NIH awards to IDeA states, while overall awards to IDeA states are on a significantly steeper trajectory.

It will be of interest to learn if this trend continues. In Kansas, approximately $75 million in awards have been made through the IDeA program. This includes five COBRE awards of approximately $10 million each to teams at K-State, KU-Lawrence, and KUMC; an additional award is pending for KUMC.

The magnitude of the IDeA awards clearly influences the drive and direction of research at KUMC as all awards in this program are reviewed under the same criteria as other NIH awards.

KUMC has a major leadership role in the State of Kansas as regards acquisition



	KC Univ of Med & Bioscience	Wichita State	Stowers Institute	Children's Mercy Hospital	Midwest Research Institute	K-State	UMKC	KU Lawrence	KUMC
FY02	515,701	908,913	1,105,170	3,271,860	0	8,251,893	10,250,471	23,470,913	37,913,217
FY03	89,207	757,530	2,011,358	3,483,835	4,913,254	7,876,331	9,876,542	27,914,961	38,772,652
FY04	0	323,550	1,919,130	3,038,116	1,976,822	8,163,935	11,782662	26,609,663	36,379,712

Figure 7 KUMC vs. other Kansas universities

of NIH funding. As shown in Figure 7, KUMC leads the state in NIH awards, with KU-Lawrence running a close second and both the University of Missouri and K-State bringing in significant grant awards. Other institutions do not, up until 2004, demonstrate significant income from NIH awards. It appears that because of the inter-institutional IDeA programs, Kansas researchers are more likely to be cooperative than competitive, the reverse of the situation that prevails in many states, and to leave competition to the sports arena.

Research leadership at KUMC

KUMC leadership in research is provided by the research deans of the three schools in cooperation with the Vice Chancellor for Research. Research grants management is a function of the KUMC Research Institute (RI), where, as of January 2005, all pre- and post-award research grant processing is done. The RI is guided by an Executive Director who is also Associate Vice Chancellor for Research Administration and a Board of Directors that includes both university and community members. The RI is composed of several divisions, some of which oversee clinical research, technology transfer, intellectual property, and commercialization.

Research areas of focus

When compared with many medical centers, KUMC does not have a large contingent of researchers. As a consequence, the university has chosen to focus on a few areas where strength has already emerged. Figure 8 shows that Cancer, Reproduction, Neuroscience, Kidney and Liver research command good to outstanding funding. All of these areas also have major potential for trans-lational research and commercialization.

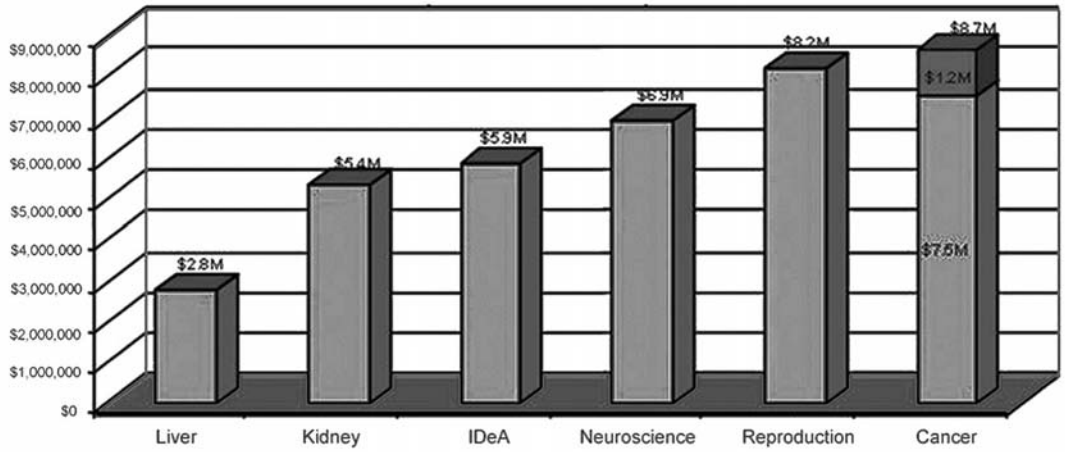
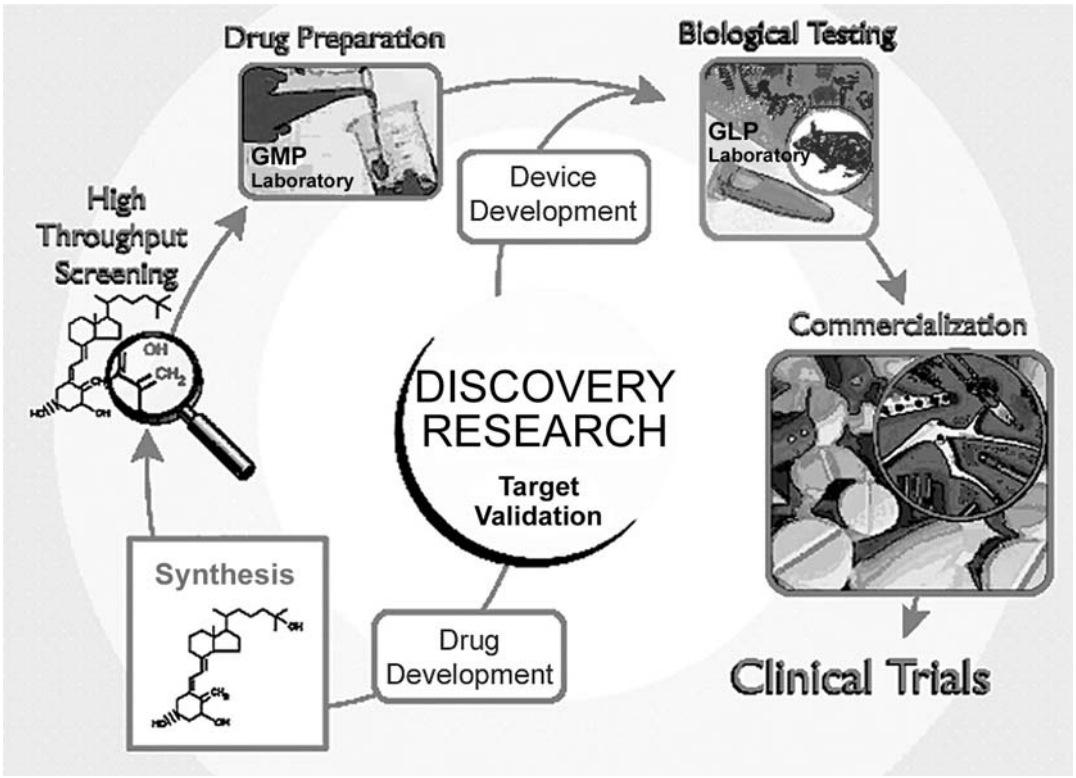


Figure 8. Funding of KUMC major research areas

The development of an NIH-supported Comprehensive Cancer Center is a major focus of the KUMC research program. This program partners importantly with the KU-Lawrence campus through its Experimental Therapeutics Program. As shown in Figure 9, drug development for cancer treatments is facilitated by the high throughput screening facility in medicinal chemistry that is supported by an NIH IDeA grant. Drug development takes place on both campuses: KU-Lawrence is in charge of the chemistry and initial testing (left half of figure), while KUMC handles the clinical aspects (right half of figure).

Figure 9. Drug development



Research in the Reproductive Sciences is concentrated in the NIH-funded Reproductive Sciences Center, Mental Retardation Research Center (MRRC), and Institute for Maternal-Fetal Biology, as well as a newly developing effort to expand gametes and embryogenesis. Neurosciences come together in the Center on Aging, Alzheimer's Disease program, the Amyotrophic Lateral Sclerosis program, the MRRC, and a Parkinson's disease center. In kidney research, new clinical and basic science researchers have joined the Kidney Institute, and the same is true in liver research, where a new center is being built.

Building support

The paragraphs above document the new direction for health-related research in the U.S. and the successful efforts of KUMC to continue competing effectively for the funds that have been put in place to facilitate translational research and commercialization. In addition, the university is building a new 205,000 sq. ft. biomedical research center to be opened in late 2006, has been actively recruiting 177 replacement and new faculty in the past three years, and has developed more active outreach or community-oriented efforts to acquire additional extramural support, such as publication of the outreach research magazine *Research in Medicine*.

In summary, KUMC research remains in accord with the stated aims and goals of world leaders, national research funding agencies, and areas of emphasis in our state and region. Whether this will lead to more innovative and imaginative research in the long term remains an open question.