

EXECUTIVE SUMMARY

KEYNOTE ADDRESS

Mary Sue Coleman
President, University of Michigan

- Institutions can make a difference in securing external funding for research. It is important to have appropriate support systems for the faculty. It is helpful for the grant administration office to provide guidance in preparing the proposals, building budgets, and meeting deadlines.
- Keeping track of trends in funding is critical. It is important to be aware of the priorities and initiatives of federal agencies and to look for opportunities. The more broadly involved your faculty are in professional activities, the better informed they will be about the large-scale picture.
- It is important to identify the best programs to target for growth and support within your institution. Tying the research and academic mission of the university to the economic climate of your state is also a good idea.
- The state of Michigan dedicated a significant portion of its tobacco company settlement to the Life Sciences Corridor, which involved making competitive awards in a state-wide initiative. The University of Michigan prioritized this initiative and established the Life Sciences Institute with a combination of a permanent endowment and seed funding from the University. In the last two years, the Life Sciences Corridor became the Technology TriCorridor and the state's commitment has shifted, but the core faculty at the University of Michigan are moving toward our goal of self-sustaining external funding.

UPDATE ON NATIONAL DEVELOPMENTS IN GRADUATE EDUCATION

Robert Barnhill
NSF/CGS Dean in Residence
Past President and Senior Scholar, KU Center for Research

- The NSF, NIH and CGS sponsored a workshop in June 2004 on "Support of Graduate Students and Postdoctoral Researchers in the Sciences and Engineering: Impact of Related Policies and Practice." 100 graduate students, postdoctoral researchers, faculty, graduate deans, labor economists and federal agency representatives attended in Washington,

D.C. One of the purposes was to define the impact of financial support in encouraging U.S. citizens to enter the fields of science, technology, engineering and mathematics.

- Labor economists at the workshop observed that the U.S. depends on a cheap labor pool of graduate students and postdocs to accomplish its academic research. Graduate study and postdoctoral training account for about 10 years of a 40-year scientific career.

FIRST PANEL OF RESEARCHERS

George Wilson, Distinguished Professor of Chemistry and Associate Vice
Provost for Research, University of Kansas

Meredith Hay, Assistant to the Vice President for Academic Affairs, University of
Missouri-system

Robert Brown, Director, Office of Biorenewables Programs, Iowa State
University

- Research administrators should play a role in establishing the proper conditions for scientists, mathematicians, engineers and clinicians to interact. Information technology is an area where leadership from the top is important. Although faculty clearly provide the energy and creativity for collaborations, research administrators have responsibility for creating the “architecture” that facilitates this – by constructing research buildings to house people with potentially common interests and by continuing to enhance and create centers.
- Essential elements of successful collaboration are: strong and respected leadership; clear identification of mutual benefits; clear criteria for setting priorities; a process for assigning credit for accomplishments; and administrative support and reward to leadership.
- Without enabling technologies such as PCR and the automated DNA sequencer, the completion of the genome projects would never have been realized. Bioinformatics – the marriage of biology and computer sciences – is one of the most robust and fastest growing fields in science. Embracing interdisciplinary approaches has created unprecedented growth in life sciences research in academia by fostering invention and discovery.
- Can we engage in a non-zero-sum game? Is there a position of cooperation and interdisciplinary/intercampus partnerships that will achieve maximum gain for each team or institution? It will require a change in our university research culture.
- The Office of Biorenewables Programs manages the Bioeconomy Initiative that was launched at Iowa State University in 2002. The

Bioeconomy Initiative is inherently systems-oriented, requiring collaboration among teams of scientists and engineers from many disciplines. It spans the campus, with 35 affiliated faculty from 12 academic departments. The basis of the research is technology platforms – the convergence of enabling technologies into a highly integrated system for transforming a specific feedstock into desired products.

PANEL OF UNIVERSITY PRESIDENTS

Jon Wefald, President, Kansas State University

Harvey Perlman, Chancellor, University of Nebraska – Lincoln

- All universities should focus on basic research. Kansas State University (K-State) is home to a major genome project – the sequencing of the genome of the red flour beetle. Land-grant institutions should also conduct research with a practical flavor where possible. K-State is the only university-based undergraduate education program in flour milling, feed milling and bakery science. 80% of the state's wheat harvest comes from K-State developed wheat varieties. To be useful, research findings have to leave the lab quickly and find their way into the economy as new products, processes, technologies and businesses.
- The Kansas State University Research Foundation is responsible for protecting the faculty's research through patents and copyrights. The University, City of Manhattan and State of Kansas through KTEC formed a partnership to develop the National Institute for Strategic Technology Acquisition and Commercialization which commercializes intellectual property at the university and also a large portfolio of donated patents.
- Research adds value to education. Students benefit from participating in a laboratory setting, and it clearly enhances their understanding of the basic discipline. Research also adds to the value of our states. K-State research adds about \$3 billion in economic development monies annually to the state of Kansas.
- Joe Collins' book *Good to Great* identifies three central themes for moving institutions from good to great: 1) Get the right people on the bus, then figure out where to drive it; 2) Develop a hedgehog concept – establishing your priorities at the intersection of three universes: the things that you can be the best in the world at, the things that you are deeply passionate about, and the things that drive your economic engine; 3) Be disciplined in confronting the brutal facts of your situation and sticking with your priorities. When applying these principles to administration of the University of Nebraska-Lincoln (UNL), the most difficult was to develop the hedgehog concept because a public university does not fully control its mission. We have come to define our concept as: being great in undergraduate education and research, which coincidentally responds to

the State's two primary needs – keeping young people in Nebraska and broadening the state's economy.

- One of the most difficult challenges is to remain disciplined and consistent with regard to priorities, and to think in the long-term. Priorities are a lot easier to follow when budgets are increasing. When Nebraska was faced with budget cuts, UNL protected its ability to make continuing investments in priorities by eliminating three peripheral academic programs after first reducing administrative functions. This resulted in termination of 23 tenured faculty who, all but one, took positions in other departments or took early retirement.

FIRST PANEL OF RESEARCH ADMINISTRATORS

James Bloedel, Vice Provost for Research, Iowa State University

Ron Trewyn, Vice Provost for Research, Kansas State University

James Roberts, Vice Provost for Research, University of Kansas

- In the late 1990's many states began to view their universities as the primary driver of economic development efforts. Iowa hired Battelle to generate a roadmap about enhancing economic development based on areas of specialization and expertise within the universities. As a consequence, universities may be asked to reallocate funds from established programs in order to adopt initiatives targeted toward economic development. One benefit of committing to this area is that an institution can market itself as an entrepreneurial university, a niche that appeals to many students.
- Iowa State University (ISU) has developed a "System for Innovation." It includes an affiliated research park and an on-campus incubator system. ISU shares instrumentation facilities with companies in the research park and throughout the state. ISU provides technical support and advice to Iowa businesses through its business support centers. As a consequence, 57 new companies have started in Iowa based on technology developed at ISU. Recently, ISU was designated one of the top three U.S. universities in the development of patentable biotechnology. It is a new era for defining the role of the research university.
- Public universities must take control of their destiny if they are to continue to ride the momentum of research into the future. Keys to success include: creating dialog with institutional customers and stakeholders; institutionalizing opportunistic flexibility and fluidity; facilitating inter- and multidisciplinary research; leveraging areas of competitive advantage; partnering with "win-win" organizations and entities; addressing local, state, national and international needs; enhancing institutional economic development activity; developing

incentives to reward entrepreneurship; modernizing graduate education programs and options; implementing an information age outreach philosophy; marketing unique attributes and value-added outcomes; and identifying metrics to document returns on investment.

- Kansas State University (K-State) has established the National Agricultural Biosecurity Center to coordinate multidisciplinary activities focused on protecting America's agricultural infrastructure. This initiative began in 1999 when K-State created a Homeland Defense Food Safety, Security, and Emergency Preparedness Program – well in advance of the 9/11 terrorist attacks. In addition to USDA funding for the new Center, K-State has received funding for the Great Plains Diagnostic Network – a nine-state regional hub that provides county-by-county plant disease/pest surveillance and diagnostics. The NSF has also provided funding for veterinary telemedicine that includes livestock health sensors.
- KU is one of the fastest growing institutions in the country in terms of research volume. When we designate a research center on our campus, these are the attributes we consider: national or international prestige; it fits the special character of the campus; it is truly interdisciplinary; it provides administrative services to researchers; it is inclusive, not exclusive; it has a large volume of externally funded research, as measured by their discipline; it provides a significant return on investment; it is flexible. To be successful, a center must begin with a natural interest from the faculty. Top-down directed centers often do not work.
- KU uses a double-counting system for research dollars – credit and return of overhead money flow, first of all, back to the dean based on the faculty members' appointments, and the center gets a separate pot of money based on the grant itself, not on what the faculty do.
- We could create the situation where the graduate school really is the responsible authority for graduate degree programs that could either be located in academic units or in centers. A similar process could be used for giving credit for these degrees – we could double-count them. If a faculty member is a part of an interdisciplinary degree program in a center and has graduate students in the center, the home department could still get credit for that degree because of the faculty member's affiliation, and the research center could also count the degree. This creates more flexibility and enables the building of a degree program based on research strength.

SECOND PANEL OF RESEARCH ADMINISTRATORS

Prem S. Paul, Vice Chancellor for Research, University of Nebraska - Lincoln
Steven Warren, Director, Schiefelbusch Institute for Life Span Studies,
University of Kansas

- Much of the increase in research funding at the University of Nebraska-Lincoln has occurred because of collaboration across departments, colleges, and institutions. In 2000, UNL had a handful of large multimillion dollar grants, but today it has numerous grants of this nature. One of the new grant-funded centers is the Nebraska Center for Virology. It involves faculty from the three major biomedical research institutions in Nebraska – the University of Nebraska-Lincoln, the University of Nebraska Medical Center and Creighton University.
- Faculty effort and institutional commitment are critical for obtaining grant funding of significance. In each instance of success at UNL, it is the faculty who conceived the innovative ideas and had the experience, desire and commitment to put together strong teams. At the institutional level, UNL provides support by awarding seed funding of research clusters and making strategic investments.
- KU's Life Span Institute has 12 programs with 87 principal investigators and has been in existence for four decades. The combined footprint of the Institute, together with shared programs at the Medical Center in Kansas City, represents approximately 36 million dollars in research, development, training, and clinical activity in a given year. The Institute leverages about 6 external dollars for every dollar received from the state of Kansas. NIH is the largest source of funding, but others include Health and Human Services, the Department of Education, the state of Kansas, and foundations.
- These are the characteristics of the Life Span Institute at KU: stable leadership and seasoned investigators, good state support, an evolving infrastructure, and administrative flexibility. The administration is essentially a federation of interests, not a top-down hierarchy. Program directors are active scientists, so they are impacted by the same things the PI's face.
- Tips for successful research centers: recruit, retain, mentor; evolve with the science; diversify the portfolio while enhancing its quality; build from your strengths and don't go into an area where you have no strength; measure and evaluate the effects of your policies and initiatives; reinforce innovation, creation and making a difference at all levels.

SECOND PANEL OF RESEARCHERS

Lisa Freeman, Associate Professor of Pharmacology, College of Veterinary Medicine, and Director of Mentored Training, Kansas State University

Susan Sheridan, Distinguished Professor, Educational Psychology, University of Nebraska - Lincoln

- Of the 102 public institutions classified by the Carnegie Foundation for the Advancement of Teaching as Doctoral/Research Universities-Extensive, the top 50 have a significantly higher number of centers and institutes than their counterparts. Of 20 sampled among these universities, the mission statements of their centers revealed a strong orientation toward promoting multidisciplinary research, public-private partnerships, and economic development.
- There are unresolved and ambiguous issues related to university centers and institutes that pose significant challenges for trainees, faculty and administrators, namely, organizational structure, reporting requirements, educational mission, appointments, accountability, credit and incentives. It is important to collect data about the contributions of centers and to develop criteria for determining their value. It is also worthwhile to determine if there are effective means other than centers/institutes for encouraging multidisciplinary collaborations and translational research.
- The mission of the Nebraska Center for Research on Children, Youth, Families and Schools is to improve through cutting-edge interdisciplinary research, our understanding of optimal ways that parents, teachers and other service providers in family, school and community contexts can promote the intellectual, socio-emotional, physical and behavioral adjustment of children and youth. The long-term goal of the Nebraska Center is to become a nationally recognized center of excellence. Initial objectives are: 1) Conceptualize, generate, submit and secure competitive research grant projects; 2) Foster interdisciplinary research; 3) Provide opportunities for interaction with national researchers; 4) Increase the visibility of the Center and Center faculty affiliates.

CONFERENCE REACTION AND PLAN

David Shulenburg, Provost and Executive Vice Chancellor, University of Kansas – Lawrence campus

- An important theme by Mary Sue Coleman is to encourage faculty initiative and provide institutional support.
- The states of Kansas, Nebraska, Iowa and Missouri should consider a formal collaboration for research dollars. At least three of the states are low population, and each of the universities represented at this

conference is moderate in scale. We could benefit from sharing resources and realizing economies of scale by working together.

- I propose that we hire a research team to do a SWOT analysis on the schools in our four states: identifying the major research opportunities that our resources don't now enable us to seize; identifying the existing faculty, facilities and expertise for addressing problems; identifying the facilities and faculty we don't have and need; and recommending where facilities and expertise would best be located among the universities in the region.