



Annual Report
2005

Our History and Mission

The Higuchi Biosciences Center (HBC) was brought into existence in 1988 through the merger of the existing Center for Bioanalytical Research (CBAR) and the Center for Biomedical Research (CBMR). CBAR had a mission of stimulating economic development by converting university-based technological discoveries into products, services, jobs, and companies. Principal support for this activity came from a grant from the Kansas Technology Enterprise Corporation (KTEC). The other Center, CBMR, was supported by the University of Kansas Office of Research for the purpose of promoting basic, multidisciplinary research in the biomedical sciences.

Combining the basic research and economic development missions was based on the concept that basic research is the cornerstone upon which applied research and its ultimate economic impact are based. By having both activities administered by the same unit, we can increase the opportunities to identify technologies appropriate for development and enhance the possibility that such development will occur.

The HBC is divided into two major activities: basic research support (KUCR funds) and technology maturation (KTEC funds). Basic Research Support activity consists of space management, proposal preparation, and grants management activities including purchasing, accounting, and personnel functions. The Technology Maturation activity consists of developmental research in drug delivery, drug analysis, drug discovery, target identification and biomedical reagents.

The Center's strength lies in the scientific reputation of its faculty and staff, and in its history of leadership in pharmaceutical research. Higuchi Center investigators command international respect in their areas of research. Graduates of the Center's program are highly sought after in the pharmaceutical industry.

The Center is named in honor of the late Takeru Higuchi, a long-time faculty member, entrepreneur, and chair of the Department of Pharmaceutical Chemistry at the University of Kansas. Higuchi is recognized worldwide as an entrepreneur and as father of physical pharmacy.





Annual Report - 2005

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Higuchi Biosciences Center Mission:

To enhance the environment for basic biomedical research at the University of Kansas and to advance the commercial development of the results of that research.

The Year in Review



The landscape for research at the University of Kansas and the Higuchi Biosciences Center is changing rapidly. The west campus area is becoming a hub of biomedical research. With completion of the Structural Biology Center and construction of the Multidisciplinary Research Building each within a few hundred yards of the Higuchi Complex and with the addition of several new faculty in our affiliated academic departments, KU is poised for continued growth of life science research even though the budget of the National Institutes of Health is no longer experiencing the growth that it had in the past ten years. I say this despite the fact that external funding for research in 2005 appeared to remain constant at \$16.6 million compared to 2004. The reason for my optimism is two-fold. First, our funding level appeared to remain constant due to the fact that in the previous year we reported more than \$2 million in one-time equipment and renovation awards; second, several new faculty members are beginning to have early success at the federal funding agencies such that NIH RO1 awards

increased by a healthy 13 percent. Thanks to superb mentoring from the two COBRE programs, I expect this early success to lead to continued and expanded success. Additional optimism comes from the fact that more mid-career scientists are planning and submitting larger, multi-investigator proposals.

As you will note on page 5, some 86 percent of HBC's grant funding comes from federal agencies, with 73 percent of the total coming from NIH. Eight different institutes within the NIH sponsor research of HBC-affiliated scientists. Foundation and not-for-profit funding nudged up one percent which probably reflects the success of new faculty members securing early research funding from this traditional source for exploratory projects.

Last year we reported implementing the new structure for the KTEC portion of the HBC. That process has gone well, allowing us to focus resources on those projects with the best hope for ultimate commercial success. During this year we awarded two Proof of Concept grants, one of which has already shown promise of resulting in a product to add to the Product Development Core pipeline. We also held the inaugural meeting of our newly assembled Industrial Advisory Board.

During 2005 HBC and KTEC co-funded our first ever entrepreneur-in-residence. This experiment in business formation seems likely to pay dividends. KTEC hired Diarmuid Boran, formerly of Marion Laboratories and Biovail Pharmaceuticals to work with HBC and area scientists to search out technologies for development. Boran will spend a great deal of time with HBC scientists and hopes to develop a business concept based upon technology opportunities he expects to find at KU. Boran has embarked on this task with great enthusiasm.

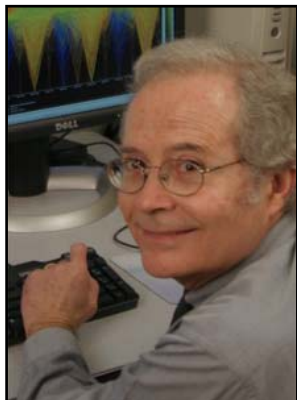
Regarding HBC spin-out companies, CyDex continues its efforts to develop new formulations using its patented Captisol® technology. ProQuest Pharmaceuticals was bought out by Guilford Pharmaceuticals based on the success of their prodrug of propofol. CritiTech initiated a process that should lead to the submission of its first Investigational New Drug application for its Nanotax® product. A contract was signed to construct a GMP-grade crystallizer that will be installed at CritiTech's partner Aptuit, the company that bought out Quintiles. The CritiTech/HBC partnership continues to be a strong and productive one.

I am pleased to report that the new partnership announced last year between the HBC and KU's Division of Continuing Education has borne fruit. The NSF awarded KU a Partnerships for Innovation grant and the short courses for life science workers envisioned in the proposal are being offered.

All together, 2005 was another productive year.

– Charles J. Decedue, Ph.D.
Executive Director

Creating a Climate of Collaboration



The annual report from the Higuchi Biosciences Center (HBC) outlines a strong record of continued success in both the conduct of basic biomedical research and in the development and transfer of new technologies from the University to the private sector. The number of scientist participants in HBC-sponsored scientific efforts has been increasing steadily and the HBC has been at the forefront of University Research Centers in terms of creating multidisciplinary research programs and core scientific facilities that serve the community of biomedical scientists. The University of Kansas and, in particular, the KU Center for Research (KUCR), have been strong supporters of the efforts of the HBC in all aspects mentioned above: establishment of grants preparation and management services, purchase of instrumentation for equipping core scientific facilities, and personnel support for the Directors and their associates in the scientific facilities. The establishment of the Transgenics and Gene Knockout Mouse facility was initiated by the HBC and is strongly supported by KUCR, as is true also for the

Genomics Facility. Other major laboratory facilities that were assisted in their expansion by the HBC include the Microscopy and Imaging, the High Throughput Screening, and the Analytical Proteomics facilities. Over \$3 million of Federal, KUCR and HBC funds have been invested in the last two years for the purchase of equipment for some of these facilities, and over \$2 million of National Institutes of Health (NIH) and KUCR funds will be invested in the renovation of the Animal Care facilities in order to house the Transgenics facility, a new Biobehavioral Measurement Laboratory, and a new Pathology Laboratory.

All of these investments in personnel and equipment are important in trying to maintain the competitiveness of all biomedical scientists at the University of Kansas. In this period of very difficult competition for grant support from Federal Agencies, in particular the NIH, any advantage that we can give our scientists in the competition could be very significant in tipping the scales of the reviews in a KU scientist's favor. The efforts and investments made by the HBC and KUCR in good grants preparation services and excellent core facilities may account, to a significant extent, for the continued success of HBC scientists in external grant competition. The HBC has continued to create a climate of true collaboration across disciplines as evidenced by the successful funding of large programmatic research efforts, such as two Centers of Biomedical Research Excellence (COBRE) grants, a Chemical Methodologies and Library Design, a program project grant on Reactive Oxygen Species and Aging, and several multi-investigator grants that are neither Center nor Program Project grants. To support the research efforts of scientists affiliated with the HBC, the Center administration also approved a record amount of equipment purchases from the indirect cost return to the Center.

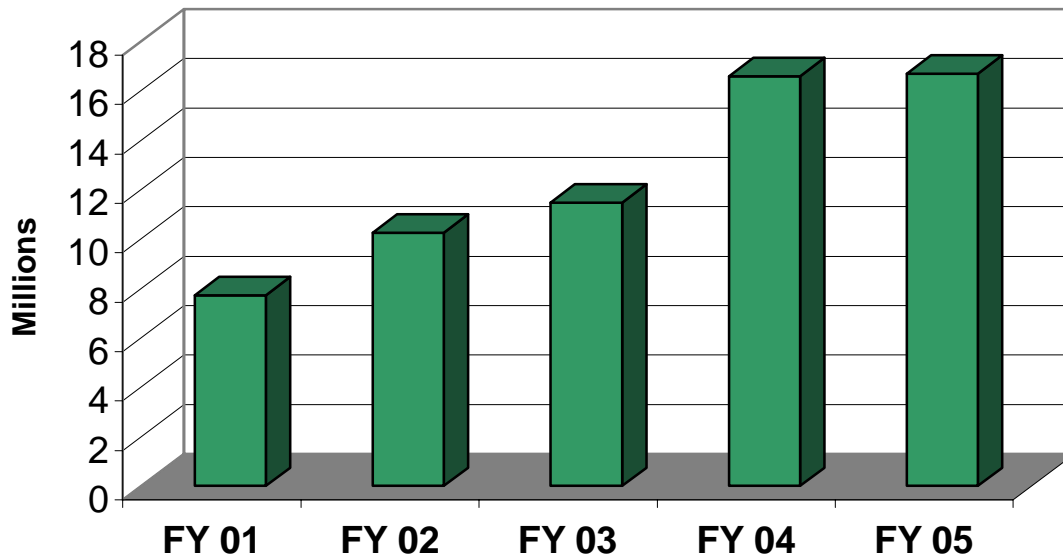
As outlined in this Annual Report, the HBC has also continued in its successes in the areas of technology development and technology transfer. Companies that originated from research at the HBC, are expanding their activities in the biotech/pharmaceutical arena. One of the companies became sufficiently attractive to other pharmaceutical companies so that it was purchased by one of them. The investment of essentially all Kansas Technology Enterprise Corporation money received by the HBC in proof of concept grants for new products and in product development efforts is beginning to pay dividends in terms of new and exciting accomplishment in drug development. The partnership of the HBC with the Office of Therapeutics, Discovery and Development promises to lead to the advancement of one or more drug candidates to the level of an initial investigational drug. Thus, the HBC continues in a path of becoming a major component in the economic growth of the State of Kansas, a process that depends more and more on life sciences research and product development as evidenced by the passage of the Kansas Economic Growth Act and the establishment of the Kansas Bioscience Authority.

There is no doubt that the HBC is entering a new era of science and economic development and it is doing so in a manner that should produce even greater results in the areas of research and product development. It is clear that the HBC has an established position as a true "Center of Excellence" in biomedical sciences and that it is the leading Center in the State of Kansas in the area of economic development through research and technology development in the life sciences.

– Elias K. Michaelis, M.D., Ph.D.
Director

Grant Activity Historical Perspective

Total Yearly Grant Volume



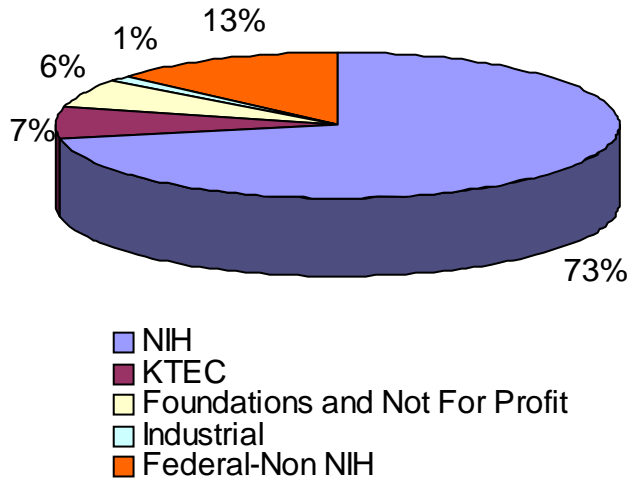
Million Dollar Research Awards

- ◆ Gunda Georg received a three-year \$4.58 million contract renewal from the National Institutes of Health – Child Health and Human Development titled “Synthesis and Testing of Male Contraceptive Agents.”
- ◆ Jane Aldrich received a five-year \$1.48 million grant from the National Institutes of Health - Drug Abuse titled “Peptide Ligands for κ Opioid Receptors.”
- ◆ Ernst Schonbrunn received a five-year, \$1.3 million grant from the National Institutes of Health - General Medicine Sciences titled “Structure-Activity Analysis of Enolpyruvyl Transferases”
- ◆ Robert Ward received a five-year, \$1.3 million grant from the National Institutes of Health - Child Health and Human Development titled “Mechanisms of Hormone-Dependent Rho Activation.”
- ◆ Kristi Neufeld received a five-year \$1.25 million grant from the National Institutes of Health - National Cancer Institute titled “Nuclear Functions of the Tumor Suppressor Protein APC.”
- ◆ Christian Schöneich received a five-year, \$1.11 million grant from the National Institutes of Health - Aging titled “Proteomic Characterization of Aging Cerebellum.”
- ◆ Elias Michaelis received a one-year \$1.97 million grant from National Institutes of Health - Health Resources and Services Administration titled “Transgenics, Genomics, Imaging and Biobehavioral Measurement Laboratories.”

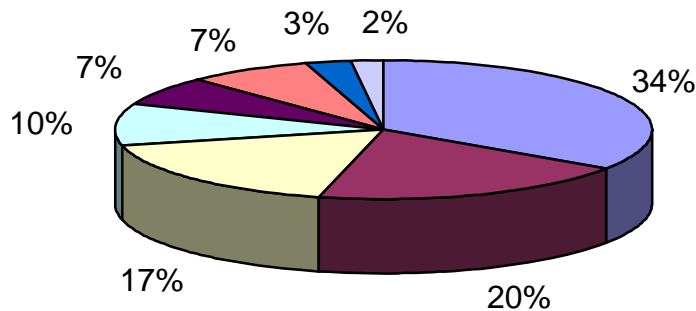
Grant Activity

Grants by Source

Sources of Grant Funding



NIH Funding by Institute



- National Center for Research Resources
- National Institute of General Medical Science
- National Institute on Aging
- National Institute of Allergy and Infectious Diseases
- National Cancer Institute
- National Institute of Child Health & Human Development
- National Institute of Neurological Disorders & Stroke
- National Institute on Drug Abuse

Grants by Funding Source

FEDERAL SOURCES

NIH - National Cancer Institute

Tyloindicines: Chemistry and Biology

G. Georg with R. Himes, S. Quackenbush and T. Williams \$1,230,204/4 years

A Yeast Model for Determining Tubulin-drug Interactions

R. Himes with G. Georg and K. Suprenant \$1,062,720/4 years

Nuclear Functions of the Tumor Suppressor Protein APC

K. Neufeld \$1,260,581/5 years

NIH - National Center for Research Resources

Center for Cancer Experimental Therapeutics

G. Georg with A. Dutta, C. Berkland, S. David, E. Harsay, P. Hanson,
R. Himes, L. Mitscher, M. Mure, S. Vigil-Cruz, and Q. Ye \$9,9624,993/5 years

Protein Structure and Function

R. Hanzlik with M. Alterman, B. Blagg, X. Chen, H. Desaire,
S. Egan, A. Lamb, J. Limburg, M. Michaelis, E. Schönbrunn, E. Scott,
J. Staudinger and A. Zaidi \$10,165,513/5 years

NIH – National Institute of Allergy and Infectious Diseases

Gram-Negative Sepsis:Pharmacophore-Based

S. David with A. Dutta, G. Georg, G. Lushington and Q. Ye \$1,633,161/5 years

Hydrophobic Polyamine Amides as Anti-Endotoxin Agents

S. David \$1,366,150/5 years

IPAC-Mediated Invasion of Epithelial Cells by Shigella

W. Picking with C. Middaugh and W. Picking \$1,005,146/4 years

Novel Leads for the Therapy of Gram-Positive Sepsis

S. David \$144,000/2 years

Rational Development of Endotoxin Sequestering

S. David with A. Dutta \$998,138/4 years

NIH - National Institute of Child Health & Human Development

Synthesis & Testing of Male Contraceptive Agents

G. Georg with J. Tash, E. Schönbrunn and Q. Ye \$4,582,615/3 years

Mechanisms of Hormone-Dependent Rho Activation

R. Ward \$1,292,218/5 years

NIH - National Institute of General Medical Sciences

Center of Excellence in Chemical Methodologies & Library Development

J. Aubé with B. Blagg, R. Borchardt, K. Buszek, A. Dutta, D. Flynn,
G. Georg, R. Givens, P. Hanson, R. Larock, G. Lushington,
H. Malinakova, E. Michaelis, L. Mitscher, J. Tunge,
D. VanderVelde, T. Williams and Q.Ye \$9,568,657/5 years

Rab11-Mediated Polarization of the Drosophila Oocyte

R. Cohen \$931,200/4 years

Training Grant in Dynamic Aspects of Chemical Biology

K. Bowman-James with M. Richter \$809,875/5 years

Structure-Activity Analysis of Enolpyruvyl Transferases

E. Schonbrunn with A. Dutta \$1,296,000/5 years

Grants by Funding Source – (cont'd)

FEDERAL SOURCES (cont'd)

NIH - National Institute of Neurological Disorders & Stroke

<i>Analytical Methods for Investigation of Peptide Transport</i> S. Lunte with K. Audus and K. Nordheden	\$826,647/5 years
<i>Cytoskeletal Signaling and Axon Guidance</i> E. Lundquist	\$856,775/4 years
<i>Novel High-throughput Assay for Angiogenesis Inhibitors</i> S. David	\$72,000/1 year

NIH - National Institute on Aging

<i>Role of Reactive Oxygen Species in Aging</i> E. Michaelis with D. Bigelow, E. Floor, S. Lunte, M. Michaelis, C. Schöneich, T. Squier and T. Williams	\$6,253,142/5 years
<i>Modulation of Tau Function by AD-Type Phosphorylation</i> C. Gamblin	\$1,401,403/5 years
<i>Multifunctional Reagents for Proteomics of Protein Modification</i> C. Schöneich with V. Sharov and J. Stobaugh	\$1,114,620/5 years
<i>Proteomic Characterization of Aging Cerebellum</i> C. Schöneich with E. Michaelis, M. Michaelis, J. Stobaugh and A. Zaidi	\$1,114,620/5 years

NIH - National Institute on Drug Abuse

<i>KO2-Opioid Peptide Analogs as Probes of Opioid Receptors</i> J. Aldrich	\$650,919/5 years
<i>Peptidic Ligands for κ Opioid Receptors</i> J. Aldrich with G. Lushington and D. VanderVelde	\$1,477,836/5 years

HHS - Health Resources and Services Administration

<i>Tranogenics, Genomics, Imaging and Biobehavioral Measurement Laboratories</i> E. Michaelis	\$1,968,320/1 year
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National Science Foundation

<i>CAREER: Genetic Control of Axon Guidance in C. Elegans</i> E. Lundquist	\$552,461/5 years
<i>Development and Application of Improved Methods for Coupling NMR and Capillary Isotachophoresis</i> C. Larive	\$322,482/3 year
<i>Life Sciences Workforce Development: Partnerships for Innovative Laboratory Training</i> J. Smith with C. Decedue	\$600,000/3 years

U.S. Department of Defense, Army

<i>Design, Synthesis, and Evaluation of Paclitaxel Analogues for the Treatment of Breast Cancer</i> G. Georg	\$66,000 /3 years
<i>Synthesis of Cryptophycin Affinity Labels</i> G. Georg	\$147,895/3 years
<i>Patterning Complex Motor Proteins on Solid Surfaces</i> M. Richter with C. Berrie	\$100,000/1 year

Grants by Funding Source (cont'd)

STATE SOURCES

Kansas Technology Enterprise Corporation

Center of Excellence Core Funding

E. Michaelis with C. Decedue and R. Rajewski \$1,107,589/1 year

Protein Structure and Function (match for NIH COBRE award)

R. Hanzlik \$250,000/5 years

Kansas NSF EPSCoR

First Award: Analysis of the Effects of Protein-Methionine Oxidation on Protein Targets In Vivo, Using a Methionine Sulfoxide Reductase Null Mutant Yeast Strain

J. Moskovitz \$50,000/1 year

FOUNDATIONS AND OTHER NOT-FOR-PROFIT SOURCES

American Diabetes Association

Schwann Cell Signaling in Diabetic Neuropathy

R. Dobrowsky \$100,000/1 year

American Heart Association - Heartland

Modulation of SERCA Activity and Redox Inactivation by the Antiapoptotic Protein Bcl-2

C. Schöneich \$121,000/2 years

Inhibition of Adenylyl Cyclases by Fluorescent Nucleotides

R. Seifert \$143,000/2 years

A Novel Strategy to Overcome Blood-Brain Barrier for Target Drug Delivery

T. Siahaan \$93,674/2 years

A Separation Based Sensor to Study the Role of Peroxynitrite and Related Species in Cardiovascular Disease.

S. Lunte \$50,000/2 years

Single-Protein Dynamics of Calcium Signaling

C. Johnson \$143,000/2 years

Boston Medical Center

NO, Serca and Oxidative Stress in Atherosclerosis

C. Schöneich \$28,800/1 year

Harvard Univeristy

National Center for Drug Discovery in Neurodegeneration Postdoctoral Fellow

M. Michaelis \$64,512/1 year

Institute for the Study of Aging

Microtubule-Stabilizing Drugs for Alzheimer's Disease: In Vivo Analysis in Tau Mutant Mice

M. Michaelis with S. Fowler and M. McIntosh \$258,352/2 years

J.R. & Inez Jay Biomedical Research Fund

High-Throughput Screening of Molecular Chaperones

B. Blagg with M. Alterman and Q. Ye \$30,000/1 year

Constructing Gene Networks from Microarray data for Age-Dependent Epileptogenesis

X. Chen with E. Michaelis and X. Wang \$37,200/1 year

Lesch-Nyhan Syndrome Children's Research Foundation

Molecular Analysis of G-Protein Mediated Signal Transduction in Fibroblasts from Patients with Lesch-Nyhan Disease

R. Seifert \$30,000/1 year

Grants by Funding Source (cont'd)

FOUNDATIONS AND OTHER NOT-FOR-PROFIT SOURCES (Cont'd)

Kansas State University

Epithelial Function in Health and Disease

K. Mitchell

\$220,215/1 year

University of Iowa

Biodefense: Analysis of Human Lung-Host-Pathogen Interactions

W. Picking

\$60,000/1 year

University of Kansas Medical Center

Undergraduate Support Core K-INBRE

E. Munson

\$51,000/1 year

Development of a Scalable Synthetic Pathway for 2,3,7,8-Tetrachloro-10H-Phenothiazine (TCPT)

V. Gurvich

\$23,965/1 year

HTS Assay for Discovering Methyltransferase Inhibitors

Q. Ye

\$45,500/1 year

University of Maryland – Baltimore

Protective Immunity by Shigella Vaccine in Humans

W. Picking

\$141,762/5 years

University of Pittsburgh

Cerebral Protection & Recovery After Circulatory Arrest

K. Mitchell

\$267,488/5 years

INDUSTRIAL SOURCES

CyDex, Inc.

Investigation of the Use of Captisol in Oral Dosage Formulations

J. Haslam

\$60,284/1 year

Evaluation of Oral Dosage Forms

M. McIntosh

\$5,078/3 months

CritiTech, Inc.

Stability of Nano-particulate Paclitaxel to Sterilization by Various Techniques

R. Rajewski with J. Haslam

\$17,365/1 year

Pfizer, Inc.

Studies on the Use of Solid-State NMR Spectroscopy to Better Understand the Structure of Crystalline Organic Solids

E. Munson

\$224,499/2 years

Life Sciences Work Force Development: Partnership for Innovative Laboratory Training

The National Science Foundation Partners in Innovation grant awarded to KU is designed to create a sustainable program that will allow professionals in the Kansas City metro area to participate in a series of intensive 1-2 day short courses in a variety of techniques to help bioscience industry professionals receive the continuing education they need to remain successful and productive. Vice Provost for University Outreach and Dean of Continuing Education JoAnn Smith as Principal Investigator, and Charles Decedue, HBC Executive Director, as Co-PI have gathered information on nationally known science-based companies and forged strategic partnerships with them. Examples of courses that will be offered include: technical writing, laboratory safety, basic and advanced cell culture, FDA, OSHA and EPA compliance, introductory biostatistics, introductory epidemiology, statistical computing, advanced HPLC, mass spectrometry and gas chromatography, among others.

FY 2005 Research Participants

- ♦ **Abdulkali Agbas, Ph.D.**, Assistant Research Professor, Higuchi Biosciences Center
- ♦ **Jane V. Aldrich, Ph.D.**, Professor, Department of Medicinal Chemistry
- ♦ **Michail Alterman, Ph.D.**, Director, Biochemical Resource Service Laboratory
- ♦ **Jeff Aubé, Ph.D.**, Professor, Department of Medicinal Chemistry
- ♦ **Kenneth L. Audus, Ph.D.**, Chair, Professor, Department of Pharmaceutical Chemistry
- ♦ **Cindy L. Berrie, Ph.D.**, Assistant Professor, Department of Chemistry
- ♦ **Brian S. Blagg, Ph.D.**, Assistant Professor, Department of Medicinal Chemistry
- ♦ **Ronald T. Borchardt, Ph.D.**, Solon E. Summerfield Distinguished Professor of Pharmaceutical Chemistry
- ♦ **Kristin Bowman-James, Ph.D.**, Professor, Department of Chemistry
- ♦ **Xue-wen Chen, Ph.D.**, Assistant Professor, Department of Electrical Engineering and Computer Science
- ♦ **Robert S. Cohen, Ph.D.**, Associate Professor, Department of Molecular Biosciences
- ♦ **Sunil A. David, M.D., Ph.D.**, Assistant Professor, Department of Medicinal Chemistry
- ♦ **Charles J. Decedue, Ph.D.**, Executive Director and Research Professor, Higuchi Biosciences Center
- ♦ **Heather Desaire, Ph.D.**, Assistant Professor, Department of Chemistry
- ♦ **Rick T. Dobrowsky, Ph.D.**, Associate Professor, Department of Pharmacology & Toxicology
- ♦ **Apurba Dutta, Ph.D.**, Assistant Professor, Department of Medicinal Chemistry
- ♦ **Susan M. Egan, Ph.D.**, Associate Professor, Department of Molecular Biosciences
- ♦ **Erik Floor, Ph.D.**, Associate Professor, Department of Molecular Biosciences
- ♦ **T. Christopher Gamblin, Ph.D.**, Assistant Professor, Department of Molecular Biosciences
- ♦ **Gunda I. Georg, Ph.D.**, University Distinguished Professor, Department of Medicinal Chemistry
- ♦ **Rich Givens, Ph.D.**, Professor, Department of Chemistry
- ♦ **Gary L. Grunewald, Ph.D.**, Professor, Department of Medicinal Chemistry
- ♦ **Vadim Gurvich, Ph.D.**, Assistant Director, Center for Drug Design
- ♦ **Paul R. Hanson, Ph.D.**, Associate Professor, Department of Chemistry
- ♦ **Robert P. Hanzlik, Ph.D.**, Professor, Department of Medicinal Chemistry
- ♦ **Edina Harsay, Ph.D.**, Assistant Professor, Department of Molecular Biosciences
- ♦ **John Haslam, Ph.D.**, Research Professor, Higuchi Biosciences Center
- ♦ **Rebecca Hays, Ph.D.**, Assistant Professor, Department of Molecular Biosciences
- ♦ **John Hefferren, Ph.D.**, Research Professor, Higuchi Biosciences Center
- ♦ **Richard H. Himes, Ph.D.**, Professor Emeritus, Department of Molecular Biosciences
- ♦ **Weijun Huang, Ph.D.**, Director, Protein Structure Laboratory
- ♦ **Carey K. Johnson, Ph.D.**, Associate Professor, Department of Chemistry
- ♦ **Krzysztof Kuczera, Ph.D.**, Associate Professor, Department of Chemistry
- ♦ **Keshava N. Kumar, Ph.D.**, Associate Director, Center for Neurobiology and Immunology Research, Associate Research Professor, Higuchi Biosciences Center
- ♦ **Audrey L. Lamb, Ph.D.**, Assistant Professor, Department of Molecular Biosciences
- ♦ **Cynthia K. Larive, Ph.D.**, Associate Professor, Department of Chemistry
- ♦ **Julian Limburg, Ph.D.**, Assistant Professor, Department of Chemistry
- ♦ **Erik A. Lundquist, Ph.D.**, Assistant Professor, Department of Molecular Biosciences
- ♦ **Susan M. Lunte, Ph.D.**, Professor, Department of Pharmaceutical Chemistry
- ♦ **Gerald H. Lushington, Ph.D.**, Director of Laboratories, Molecular Graphics/Modeling Lab

FY 2005 Research Participants

- ♦ **Helena C. Malinakova, Ph.D.**, Assistant Professor, Department of Chemistry
- ♦ **Michelle P. McIntosh, Ph.D.**, Assistant Director, Center for Drug Delivery Research, Assistant Research Professor, Higuchi Biosciences Center
- ♦ **Elias K. Michaelis, M.D., Ph.D.**, Chair, University Distinguished Professor, Department of Pharmacology & Toxicology; Director, Higuchi Biosciences Center; Director, Center for Neurobiology & Immunology Research, Higuchi Biosciences Center
- ♦ **Mary L. Michaelis, Ph.D.**, Professor, Department of Pharmacology & Toxicology
- ♦ **Kathy E. Mitchell, Ph.D.**, Assistant Professor, Department of Pharmacology & Toxicology
- ♦ **Lester A. Mitscher, Ph.D.**, University Distinguished Professor, Department of Medicinal Chemistry
- ♦ **Eric J. Munson, Ph.D.**, Associate Professor, Department of Pharmaceutical Chemistry
- ♦ **Minae Mure, Ph.D.**, Assistant Professor, Department of Chemistry
- ♦ **Kristi L. Neufeld, Ph.D.**, Assistant Professor, Department of Molecular Biosciences
- ♦ **Karen J. Nordheden, Ph.D.**, Associate Professor, Chemical & Petroleum Engineering
- ♦ **William D. Picking, Ph.D.**, Associate Professor, Department of Molecular Biosciences
- ♦ **Wendy L. Picking, Ph.D.**, Assistant Research Professor, Higuchi Biosciences Center
- ♦ **Roger A. Rajewski, Ph.D.**, Acting Director, Center for Drug Delivery Research, Associate Research Professor, Higuchi Biosciences Center
- ♦ **Mark L. Richter, Ph.D.**, Professor, Department of Molecular Biosciences
- ♦ **J. Howard Rytting, Ph.D.**, Professor, Department of Pharmaceutical Chemistry
- ♦ **Ernst Schönbrunn, Ph.D.**, Assistant Professor, Department of Medicinal Chemistry
- ♦ **Christian Schöneich, Ph.D.**, Professor, Department of Pharmaceutical Chemistry
- ♦ **Richard L. Schowen, Ph.D.**, Summerfield Distinguished Professor Emeritus, Department of Chemistry, Molecular Biosciences, and Pharmaceutical Chemistry
- ♦ **Emily E. Scott, Ph.D.**, Assistant Professor, Department of Medicinal Chemistry
- ♦ **Roland J. Seifert, M.D., Ph.D.**, Associate Professor, Department of Pharmacology & Toxicology
- ♦ **Viktor S. Sharov, Ph.D.**, Assistant Research Professor, Higuchi Biosciences Center
- ♦ **Mario F. Simeonov, Ph.D.**, Associate Research Professor, Higuchi Biosciences Center
- ♦ **Jeffrey L. Staudinger, Ph.D.**, Assistant Professor, Department of Pharmacology & Toxicology
- ♦ **Valentino J. Stella, Ph.D.**, University Distinguished Professor, Department of Pharmaceutical Chemistry
- ♦ **John F. Stobaugh, Ph.D.**, Professor, Department of Pharmaceutical Chemistry; Director, Center for Bioanalytical Research, Higuchi Biosciences Center
- ♦ **Kathy A. Suprenant, Ph.D.**, Professor, Department of Molecular Biosciences
- ♦ **Elizabeth M. Topp, Ph.D.**, Professor, Department of Pharmaceutical Chemistry
- ♦ **Jon A. Tunge, Ph.D.**, Assistant Professor, Department of Chemistry
- ♦ **David VanderVelde, Ph.D.**, Director, Nuclear Magnetic Resonance Laboratory
- ♦ **Sandra Vigil-Cruz, Ph.D.**, Assistant Research Professor, Department of Medicinal Chemistry
- ♦ **Xinkun Wang, Ph.D.**, Technical Director, Genomics Laboratory
- ♦ **Robert E. Ward, Ph.D.**, Assistant Professor, Department of Molecular Biosciences
- ♦ **Todd D. Williams, Ph.D.**, Director, Mass Spectrometry Laboratory
- ♦ **Vladimir Yamshchikov, Ph.D.**, Associate Professor, Department of Molecular Biosciences
- ♦ **Qi-Zhuang Ye, Ph.D.**, Research Professor, Higuchi Biosciences Center
- ♦ **Asma Zaidi, Ph.D.**, Assistant Research Professor, Higuchi Biosciences Center

Intellectual Property Initiatives

Invention Disclosures Filed with the KU Office of Technology Transfer:

- ◆ “Cloning of a brain gene that forms an ion channel for a unique glutamate receptor, a receptor linked to brain neurodegeneration”
Inventors: Elias K. Michaelis, Dongwei Hui, Keshava N. Kumar, and Julie Mach
- ◆ “Preparation of micron and submicron particles by coarcervate dissolution and supercritical fluid solvent extraction”
Inventors: Roger Rajewski and Takehiko Yasuji

Technology Transfer Completed

CritiTech, Inc., announced that it has completed the transfer of its technology and R&D laboratory operations from the Higuchi Biosciences Center at the University of Kansas to its new facility. The commercial operation of the company was established in mid-year 2004. The company has consolidated its R&D and commercial activity into a single location and expanded its in-house drug development program CritiTech provides critical drug delivery and development technology for the pharmaceutical industry through its patented nano-particle production technology originally developed at the Higuchi Biosciences Center. In addition, the company uses its proprietary technology to coat implantable medical devices such as cardiac stents. This enables devices to be implanted with less concern about restenosis and rejection.



Company Acquired for \$7 million in stock

ProQuest Pharmaceuticals Inc., an HBC spin-off company was sold to Guilford Pharmaceuticals Inc. for \$7 million in stock. Guilford will have full ownership of the intellectual property rights for Aquavan®, an injectable sedative created at KU, developed through ProQuest and refined during the past four years through a licensing agreement with the Baltimore-based company. KU's Center for Research owns stock in ProQuest. They plan to keep the stock, but half of the proceeds from a future sale of KU's stake would go to the product's team of inventors; 25 percent would go to the KU's Department of Pharmaceutical Chemistry and Higuchi Biosciences Center; and the remaining 25 percent would go to the Center for Research to help cover costs of patents, licensing and other regulatory support.



Entrepreneur in Residence works with HBC Scientists

Diarmuid Boran was named **Kansas Technology Enterprise Corporation (KTEC)** Entrepreneur in Residence, adding to its bioscience industry resources for the state of Kansas. He will be available to the entire KTEC network to assist entrepreneurs and companies to commercialize life sciences research and innovation. KTEC is the only organization in the region that has dedicated a position exclusively for this purpose.

Boran has over 16 years of pharmaceutical, bio-pharmaceutical and contract research organization experience, including positions in finance, marketing, strategic planning, corporate development and general management. Boran is assisting the Higuchi Biosciences Center, as well as the Enterprise Center of Johnson County, a KTEC incubator.

Network Activities

Kansas Economic Growth Act: Creation of the Bioscience Authority

To ensure a comprehensive understanding of Kansas' biosciences assets and opportunities, KTEC engaged Richard Seline of New Economy Strategies to facilitate six statewide summits. The summits were designed to "kick-start" the information-gathering process to create a strategic plan, or "Roadmap" for the State's biosciences initiative. The summits brought together industry, business, academic and civic leaders in six separate cities across Kansas.

"Hot Teams" were developed around six areas that were identified as having the greatest potential for success in Kansas. These areas were: Advanced materials and medical devices; Animal science; Biomass, biofuels, biomaterials and other environmental applications; Drug discovery, Drug delivery and pharmacogenomics; Health related information technology: bioinformatics and telemedicine; and Plant sciences. Charles Decedue, Executive Director of the Higuchi Biosciences Center served on the team focused on drug discovery and development and pharmacogenomics. The teams presented business plans centered on the six areas. The plans represented the culmination of extensive collaboration between industry, scientific, academic and civic leaders from the entire state.



Grant Writing Workshop Held

A Grant Writing workshop series was held April 27 -October 29, 2004. The workshop was hosted by both Center of Biomedical Research Excellence (COBRE) projects - the Center for Cancer Experimental Therapeutics and the Protein Structure and Function as part of the COBRE's career development efforts for participating PIs. Twenty-three investigators from the following campuses participated: KU, Kansas State University, University of Missouri at Kansas City, Emporia State University, and Wichita State University.

This intense mentoring workshop focuses on knowledgeable review and critique of grant applications in-process, and culminates in the submission of the attendee's grant to the NIH.

The results of this workshop are impressive. Seven of the eleven KU faculty members who participated in the first workshop series have already had impressive results:

- 5 National Institutes of Health RO1 awards
- 1 National Institutes of Health UO1 award
- 1 National Institutes of Health R21 awards
- 1 National Institutes of Health P41 award
- 1 National Science Foundation award

Structural Biology Center dedicated

The first phase of Structural Biology Center was dedicated on October 15th. The center is directly west of the Simons Biosciences Research Laboratories on west campus. More than 100 people attended the event, including the Chancellor, Provost, Kansas Board of Regents President, and other state and college administrative representatives. The building houses the Protein Purification Group and the Protein Structure Laboratory, both affiliated with the COBRE in Protein Structure and Function.

The centerpiece of the new Center is an 800 MHz nuclear magnetic resonance spectrometer. The \$1.9 million magnet -- combined with other equipment-- give researchers unique tools for understanding the basic science behind processes such as the cause of cancer. The magnet, along with X-ray crystallography equipment housed at the center, allows researchers to get a 3-D map of proteins. It also gives the university a tool for hiring researchers.

The building, which cost \$10.2 million to build and equip, was paid for with \$5 million in bonds authorized by the Kansas Legislature in 2003, with the remainder coming from the KU Center for Research.

The COBRE-PSF held a day-and-a-half symposium in conjunction with the dedication, which was attended by more than 90 people and included participants from seven states.