

Kentucky Diabetes and Obesity Center

Goals:

The overall goal of the Kentucky Diabetes and Obesity Center is to organize and align the prominent clinical care and research focused on diabetes and obesity that is currently available at the University of Kentucky. The University of Kentucky already has a substantial core of researchers investigating diabetes and/or obesity with considerable extramural funding (see appendix A). Diabetes and obesity have broad impact on various facets of health, and clinicians and researchers are found within many departments in the College of Medicine, but also in many other colleges on campus (see appendix B). In addition, both clinical and basic science training programs with a diabetes and/or obesity focus are available across departments at the University of Kentucky. The goal is to formally recognize a Diabetes and Obesity Center as an interdepartmental vehicle for clinical care in diabetes and obesity, research growth, training in both clinical and research efforts, and to establish a focused area of excellence for recruitment. By aligning the diverse group of faculty who provide clinical excellence in patient care and/or conduct quality research in diabetes and obesity, we will build this center to national prominence.

Specific goals:

- 1) To create a nationally and internationally recognized center of excellence in diabetes and obesity encompassing state of the art patient care and cutting edge research.
- 2) To encourage research interactions and collaborations including basic, translational and clinical research, with funding from federal agencies, national foundations, and industry.
- 3) To provide a stimulating environment for the training of research and clinical trainees, including medical students, doctoral students, postdoctoral fellows, medical residents and medical fellows.
- 4) To provide a focus for the recruitment, development and retention of excellent faculty.

Intent and Rationale

The goal of the Kentucky Diabetes and Obesity Center is to organize and integrate clinical and scientific approaches to enhance diabetes and obesity research and clinical practice at the University of Kentucky. The Center will provide scientific organization and strategic planning to facilitate ongoing development of research, with the goal of obtaining federal and other extramural funding for large program project and center grants. The Graduate Center for Nutritional Sciences, already in existence, will be a natural sister center with complementary basic science research and graduate training programs in obesity and diabetes. However, the Kentucky Diabetes and Obesity Center will have a broader focus including pathogenesis of diabetes, diabetes treatments and clinical care of diabetes complications, public health implications of and potential strategies to combat obesity, pathogenesis of obesity associated health consequences including diabetes and other facets related to diabetes and obesity. A primary purpose of the Kentucky Diabetes and Obesity Center will be to integrate and thereby strengthen

clinical care, research and education currently performed across several different academic units. As such, the Kentucky Diabetes and Obesity Center will structurally integrate recruitment of faculty and trainees, development of collaborative research, and centralize provision of clinical care. Importantly, the Kentucky Diabetes and Obesity Center will provide an over-arching structure beyond the College of Medicine, and serve as a vehicle to link clinicians and researchers interested in diabetes and obesity.

Justification

Clinical and Financial Impact of Diabetes and Obesity on Kentuckian's Health

Diabetes and obesity are rampant in Kentuckians, and the University of Kentucky is uniquely poised to focus its expertise with the establishment of a diabetes and obesity center. As of 2003, Kentucky ranked 7th in the nation for highest percentage of adults with diabetes: an estimated >8.5% of Kentuckians carry a diagnosis of diabetes and it is estimated that an additional 40% are pre-diabetic. In 2002 there were >96,000 diabetes-related hospitalizations in the state, and direct and indirect costs of diabetes in Kentucky were estimated at \$2.9 billion. The numbers for obesity are even higher: Kentucky ranks 5th in the nation in prevalence of adult obesity (25.6% of adult Kentuckians are obese), and 3rd for teenage obesity. Obesity is a major risk factor for development of diabetes, as well as numerous other chronic health consequences, including cardiovascular disease, hypertension, some cancers, arthritis, sleep apnea, and other conditions. Of particular concern, the rates of diabetes and obesity are continuing to increase, further adding to the health care burden.

Scope of Clinical Care for Diabetes and Obesity at the University of Kentucky

The Division of Endocrinology and Molecular Medicine, with 7 physicians, a nurse practitioner, and 2 certified diabetes educators, is a key provider of diabetes care for both inpatients and outpatients, and has recently implemented a state of the art inpatient glycemic control approach in the Chandler Medical Center. In addition, Division faculty provide medical supervision for participants in intensive dietary programs run by Health Management Resources (HMR), via an ongoing contract. In addition, other patients receive diabetes and/or obesity care from providers in Internal Medicine, Women's Health, Pediatrics, Family Practice and Obstetrics and Gynecology. Patients with diabetes are at risk for many complications arising from end organ damage, including diseases of the retina, kidney, cardiovascular system, and damage to limbs. Thus, diabetes care often requires the expertise of ophthalmology, nephrology, cardiology, cardiovascular surgery, neurology, vascular surgery, podiatry, Maternal-Fetal Medicine and psychiatry. Clinical interventions for obesity are limited, but include intensive, medically supervised diet programs such as HMR, surgical intervention, and management of associated metabolic dysfunction and associated diseases, which also involve practitioners in numerous specialties. Despite our best efforts, a wait list for access to clinical care exists in Kentucky, and the levels of control of metabolic components of obesity and diabetes are well below standard in many individuals. Outside of our contract with HMR UK Healthcare does not provide any specific weight loss programs. Thus there exists a key need for further development and provision of clinical care to individuals with diabetes and obesity.

Scope of Diabetes and Obesity Research at the University of Kentucky

Numerous UK faculty across several divisions, departments and colleges conduct diabetes and/or obesity-focused research at UK. Diabetes and obesity are so closely linked that many research projects address both. Many of the faculty conducting diabetes and/or obesity research have joint appointments in the Graduate Center for Nutritional Sciences, Cardiovascular Research Center, and/or the Kentucky Pediatric Research Institute. Despite a diversity in academic settings that fragments researchers at the University of Kentucky, this group of faculty has obtained substantial funding including federal, foundation and industry sources (see appendix). These faculty are highly productive with numerous publications of high quality manuscripts annually. Furthermore, these faculty play a critical role in future development as they are pivotally involved in the training of numerous students, fellows, and residents. Evidence of excellence in training at the basic science level includes an NIH T32 Training Grant to the Graduate Center for Nutritional Sciences with an emphasis in diabetes, and a USDA training grant on Obesity and Diabetes. The purpose of the Kentucky Diabetes and Obesity Center is to serve as a central site to synergize efforts across the diversity of units engaged in diabetes and obesity research and clinical care. For example, development of a diabetes/obesity registry to link researchers conducting diabetes and obesity research with individuals with diabetes and obesity who are interested in participating in research, will provide a key resource facilitating improved knowledge about health and outcomes in individuals with diabetes and obesity.

Proposed structure of Kentucky Diabetes and Obesity Center

Leadership

The Kentucky Diabetes and Obesity Center will be headed by a Scientific Director. The director will provide guidance and support in the career development of faculty members and serve as a focal point for recruitment efforts. The main goal of the director will be to facilitate interactions amongst faculty members of the Diabetes and Obesity Center, and with other faculty across campus, to encourage collaborations and clinical and research excellence.

A Clinical Associate Director will report to the Scientific Director, and be primarily responsible for daily operations of clinical care. The Clinical Director will play a key role in linking basic researchers with clinical practitioners, to enhance translational research opportunities.

An Executive Committee will provide input to the Scientific and Clinical Directors of the Kentucky Diabetes and Obesity Center. The Executive Committee will be composed of faculty within the diversity of units engaged in diabetes research or clinical care. A purpose of the Executive Committee will be to represent faculty from participating units within the Kentucky Diabetes and Obesity Center.

Service

The Kentucky Diabetes and Obesity Center will provide exemplary care for patients with type 1, type 2, or other types of diabetes. Upon admission to hospital, patients will continue to be followed by their endocrinologist, leading to seamless provision of care.

Rapid responses to clinical consults will be provided by Center clinical staff for both inpatients and outpatients. Referring physicians are provided with rapid communication summarizing findings and treatment plan. Diabetes education is offered to all patients through the Certified Diabetes Educators in the Center, or referral to a local diabetes education office (for example, UK's DiabetesCare program). Urgent appointments will be accommodated every Tuesday or Friday afternoon, or at other times by arrangement. Patients will receive pre-operative or pre-procedure guidelines for diabetes management. Excellent glycemic control during hospital admissions is a priority.

Centralized treatment algorithms and guidelines are developed and provided to affiliated divisions and departments. All providers of diabetes care within the UK HealthCare network are welcome to use these guidelines and algorithms to ensure that all patients with diabetes receive exemplary care by all UK HealthCare providers. Where possible, patients will receive their diabetes care from affiliated practitioners at geographic locations close to home, and utilize the UK Diabetes and Obesity Center clinic location only as needed.

To facilitate care for outpatients with diabetes, the goal is to develop a "one stop" clinic visit addressing all diabetes needs. This will require collaborative clinical efforts and scheduling to accommodate diverse health care provider evaluations. However, by scheduling diabetes, ophthalmology, cardiology and other consultant appointments on the same day, especially for those patients who travel long distances to their appointments, patients will receive excellent, multi-disciplinary care addressing their healthcare needs, and maximizing efficient use of their time.

Currently UK Healthcare does not provide any specific weight loss programs outside of our contract with HMR; thus, a major goal is to initiate a specific weight management clinic to include diet and exercise counseling, management of obesity associated conditions, and liaison with surgical intervention centers. Furthermore, outreach efforts to develop public health measures to counteract the epidemic of obesity will be pursued.

Research, Teaching and Training

1. Research:

Diabetes and Obesity Research Seminars

A research seminar featuring UK or external invited speakers will be held monthly. This conference will facilitate interactions between diverse University faculty and trainees interested in diabetes and/or obesity research. Furthermore, regular hosting of external speakers will serve to highlight the research environment at UK and assist in the development of collaborations and external (national and international) recognition of University faculty. This conference is held jointly with the Graduate Center for Nutritional Sciences, on the 4th Wednesday of the month, 4-5 pm.

Diabetes and Obesity Clinical Conference:

A clinical conference involving diverse health care professionals providing care to those with diabetes and/or obesity will be held monthly. This conference series includes

members of the Divisions of Endocrinology, Nephrology, Cardiovascular Medicine, as well as members of the Departments of Ophthalmology, Obstetrics and Gynecology, Surgery (especially cardiovascular surgery), transplant medicine, and psychiatry. This conference is held on the 2nd Wednesday of the month, 2-3 pm.

2. Training:

Graduate Training

Training of masters and doctoral students in the area of diabetes will be provided by the Graduate Center for Nutritional Sciences, as well as other participating Basic Science Departments within the College of Medicine. Within the Graduate Center for Nutritional Sciences, an integrated curriculum will provide didactic courses in macro- and micro-nutrients, emphasizing human nutrition as relates to prevention and treatment of diabetes. Students enrolled in this training area of focus will attend the seminar series and journal club of the Kentucky Diabetes and Obesity Center, and present results of their research in the Diabetes and Obesity Research Day.

Clinical Training

Training of physicians in the area of diabetes and obesity management will be provided by the Division of Endocrinology and Molecular Medicine, as well as other participating clinical divisions and departments in the College of Medicine. Applicants wishing to become board certified in endocrinology will be encouraged to apply for clinical fellowship positions within the Division of Endocrinology. Other physicians who seek to increase their knowledge and expertise in diabetes and obesity care will attend the clinical conferences, didactic seminars and journal clubs offered by the Division of Endocrinology and the Kentucky Diabetes and Obesity Center, and in some instances may participate in clinical care provision and consult rounds.

Diabetes and Obesity Journal Club:

A monthly journal club meeting will serve as a forum for clinical and research faculty, fellows, residents and students to present and critique contemporary papers in their areas of interest. This journal club is currently held the 3rd Wednesday each month, 7:30-8:30 am.

Diabetes and Obesity Research Day:

The Cardiovascular Research Center has been hosting an annual research day for 10 years. Given the close link between diabetes, obesity and cardiovascular complications, we propose either joining or imitating this annual research day as an opportunity to highlight the breadth of diabetes research on campus. Over time, we plan to expand this event into a regional meeting, with attendees from research institutions in the region participating.

Kentucky Diabetes and Obesity Center Webpage

To facilitate communication and announcements of seminars, journal clubs, visiting speakers and other events at the Kentucky Diabetes and Obesity Center, we will develop a webpage displaying event details, highlighting affiliated faculty, and research accomplishments.

Expected outcomes:

Clearly there already exists on campus a critical mass of extremely competent and well funded faculty committed to clinical care and research focused on diabetes. The goal of the Kentucky Diabetes and Obesity Center is to serve as a focus to enhance faculty efforts in diabetes and obesity care and research. As a recognized campus Center, the Kentucky Diabetes and Obesity Center will bring regional, national and international recognition of the high quality clinical care and research performed at the University of Kentucky. This will enable further recognition of the faculty members through development of collaborations, participation on national committees and Societies, and further enhance the acquisition of extramural funding. The Kentucky Diabetes and Obesity Center will serve as a key focus of the University enterprise, and will play a critical role in recruiting and retaining talented faculty. Furthermore, the Kentucky Diabetes and Obesity Center will provide a highly visible research and clinical care center that will attract donors, to further support care and research into these diseases that afflict so many in the Commonwealth of Kentucky.

APPENDIX A:

List of faculty conducting EXTRAMURALLY FUNDED diabetes and obesity research at UK

COLLEGE OF MEDICINE,

Department of Internal Medicine

Division of Endocrinology and Molecular Medicine

Dr. Dennis Bruemmer, MD

Funding from American Diabetes Association, American Heart Association, and NIH (RO1).

Dr. Zhenheng Guo, PhD

Funding from the American Heart Association, and NIH (RO1)

Dr. Dennis Karounos, MD.

Funding from the American Diabetes Association, and a VA Merit Review.

Dr. Lisa Tannock, MD

Funding from the American Heart Association, and NIH (RO1)

Dr. Deneys van der Westhuyzen, PhD

Funding from NIH (RO1 and a PPG project)

Dr. Nancy Webb, PhD

Funding from NIH (RO1, and 2 PPG projects)

Division of Pulmonary Medicine

Dr. Leigh Ann Callahan

Funding from NIH (RO1)

Graduate Center for Nutritional Sciences

Dr. Lisa Cassis, PhD

Funding from NIH (RO1, PPG project, NIEHS Superfund Research Project, USDA Training Grant, NIH T32 Training Grant)

Center of Biomedical Research Excellence (COBRE) grant from NIH, pending (scored 127); PI is Lisa Cassis, but numerous faculty from the Department of Internal Medicine are also involved in this large grant.

Dr. Jianhua Shao, PhD

Funding from the American Heart Association, American Diabetes Association, and NIH (R21, and RO1).

Dr. Shuxia Wang, PhD

Funding from the American Heart Association

Department of Physiology

Dr. Ming Gong, PhD

Funding from NIH (RO1)

Dr. David Randall, PhD

Funding from NIH (RO1)

Dr. Sean Stocker, PhD

Funding from NIH (RO1)

Department of Molecular and Cellular Biochemistry

Dr. Sidney Whiteheart

Funding from NIH (R21)

Dr. Brian Finlin

Funding from the American Diabetes Association,

Dr. Sabire Ozcan, PhD

Funding from the American Heart Association, and NIH (RO1)

Dr. Xiaqing Tang

Funding from NIH (K01)

Department of Molecular and Biomedical Pharmacology

Dr. Olivier Thibault

Funding from NIH (R21)

Dr. Hollie Swanson, PhD

Funding from NIH (R01)

Department of Pediatrics

Dr. Eric Smart, PhD

Funding from NIH (R21, RO1)

COLLEGE OF DENTISTRY

Dr Jeffrey Ebersole,

Funding from NIH (Center of Biomedical Research Excellence)

COLLEGE OF HEALTH SCIENCES

Dr. Charlotte Peterson, PhD

Funding from NIH (RO1)

APPENDIX B:

List of other faculty conducting research pertinent to diabetes and obesity at UK

COLLEGE OF PHARMACY

Dr. Gregory Graf, PhD

Dr. Robert Lodder, PhD

COLLEGE OF AGRICULTURE

Dr. Lisa Gaetke, PhD

Dr. Bernhard Hennig, PhD

Dr. Leigh Ann Simmons, PhD

COLLEGE OF ARTS AND SCIENCES

Dr. Sylvia Daunert, PhD

Dr. Suzanne Segerstrom, PhD

COLLEGE OF MEDICINE

Dr. Thomas Kelly, PhD

COLLEGE OF NURSING

Dr. Debra Moser, DNSc, MN, RN

Dr. Terry Lennie, PhD, RN