

Cardiovascular Research Center

Director: François Abboud, MD

A Cardiovascular Center was established in 1975 by the Dean of the College of Medicine under the direction of Dr. François Abboud. The purpose is to coordinate the cardiovascular programs of the College into a more cohesive unit to permit us to 1) utilize cardiovascular resources optimally, 2) intensify, expand and integrate basic and clinical research programs in areas related to cardiovascular research, and 3) evaluate the role of new measures for prevention, diagnosis and treatment of cardiovascular disease.

Space totaling 18,000 square feet was constructed for the Center and occupied in 1982. Funding for the construction amounted to approximately 2.3 million dollars. The space consists of a fifth and sixth floor addition to the Medical Research Center Building which is the closest to the geographic center of the University Hospitals/Medical Laboratories/Eckstein Medical Research Building/Bowen Science Building complex. The fifth and sixth floors house investigator research laboratories, core research laboratories, administrative offices, seminar rooms, and the cardiovascular library and learning resource unit.

The uniquely attractive feature of the Cardiovascular Center programs at Iowa is the closely working relationship and cooperation between members of the basic science departments and the members of the clinical departments, particularly the Departments of Medicine, Neurology, Pediatrics and Surgery. Another important element in the success of this Cardiovascular Center has been the availability of a critical mass of basic scientists and clinical investigators who have full-time faculty appointments with tenure at this university. This represents a major commitment of university and state resources to cardiovascular programs which have been a significant element in its stability and success.

Carver Family Center for Macular Degeneration

Director: Edwin Stone, MD, PhD

Macular degeneration is the most common cause of legal blindness in the United States and other developed countries. About 10 percent of people over the age of 65 are affected to some degree. Treatment of the disease requires expertise at many levels including examination of the eye, evaluation of retinal angiograms, laser treatment, photodynamic therapy, subretinal surgery, counseling, and vision rehabilitation.

Unfortunately, current laser treatment, photodynamic therapy and surgery are each useful for only a few percent of individuals with macular degeneration. Even in these cases, treatment usually does not restore vision, it only stabilizes it. The development of new forms of treatment is significantly hampered by the fact that the underlying causes of macular degeneration are not well understood. In addition, there is currently no way to identify a person's predisposition to the disease so that one has to wait until the disease is clinically apparent before any type of treatment can be instituted.

In addition to these medical problems, there are political and financial problems as well. Medicare and most insurance carriers do not cover many of the costs involved in vision rehabilitation and counseling. As a result, many individuals that are visually impaired currently go without these very valuable services.

In 1997, a group of scientists and physicians at the University of Iowa met and discussed the serious problems facing individuals affected with macular degeneration. In their discussions, they came to view macular degeneration as a national problem that required a focused multidisciplinary effort similar to the effort that allowed man to walk on the moon in 1969 - less than ten years after President Kennedy challenged the country to achieve the impossible.

These investigators approached the administrative officials of the College of Medicine and the University and with their help worked out a plan for a Center for Macular Degeneration that would allow world class physicians and scientists from a number of disciplines to be assembled at the University of Iowa for the purpose of working toward a cure for this devastating disease. The assembly of the Center would involve recruitment of new faculty, reorganization of existing faculty, construction and renovation of large amounts of laboratory space, and the acquisition of a significant number of new scientific and clinical instruments. In late 1997, the Board of Regents approved the creation of the Center and work was begun. As one of their first tasks, the faculty of the new Center created a mission statement to clearly set out their goal to contribute to a cure for macular degeneration, while simultaneously providing state of the art care to people who are already afflicted.

Center for Auditory Regeneration and Deafness

Directors: Bruce Gantz, MD, Richard Smith, MD

The Iowa Center for Deafness and Auditory Regeneration is a new initiative designed to create and develop new therapeutic regimens to treat persons with hearing loss. The Center brings together investigators in the Departments of Otolaryngology—Head and Neck Surgery, Anatomy and Cell Biology, Speech Pathology and Audiology, Biology, Physiology and Biophysics, Neurosurgery.

Regeneration of a damaged auditory system was only a dream a few years ago. However, accelerated research in the areas of molecular genetics, developmental neurobiology, electrophysiology, digital signal processing, molecular signal transduction, and cochlear implant research provide a foundation for the concept that regeneration of components of the auditory system are within reach. It is projected that an interface between electrical stimulation of the auditory system, molecular biology and molecular genetics may emerge as a first step in accomplishing regeneration of the neural elements of the auditory system.

Several key laboratories and researchers are in place at the University of Iowa and are well positioned to contribute to the development of new strategies to manage hearing loss. The Iowa Center for Deafness and Auditory Regeneration will provide an organizational structure to coordinate this multidisciplinary research team, lead the recruitment of needed molecular developmental and signal transduction neuroscientists, and develop focused integrated research questions from the periphery to the central nervous system.

The need for this type of center is acute. It is estimated that there are more than 28 million individuals in the United States with severe hearing impairment, making hearing loss the third most prevalent chronic condition in older Americans after hypertension and arthritis. The prevalence of hearing impairment increases with age, affecting 25-40% of persons over 75 years of age and more than 80% of persons over 85.

It is anticipated that The Iowa Center for Deafness and Auditory Regeneration will provide a research environment that will stimulate development of novel therapeutic management strategies for hearing impairment. The Center will be composed of several existing units including: Auditory Molecular Genetics Laboratories; Auditory Digital Signal Processing Laboratories; Auditory Signal Transduction Laboratories; Auditory Electrophysiology Laboratories; Human Auditory Neurophysiology Laboratory; and Cochlear Implant Development Laboratories. Recruitment of one or two additional neuroscientists in the area of molecular neurophysiology and molecular developmental neuroscience is in progress.

Center for Bioinformatics and Computational Biology

Director: Tom Casavant, PhD

The UI Center for Bioinformatics and Computational Biology (CBCB) is a multi-disciplinary research enterprise dedicated to integrative research involving biomedicine, engineering, basic life sciences, computational science, translational medicine, mathematics and statistics. Founded jointly by the UI Colleges of Medicine and Engineering in 2002, the CBCB has members from 7 UI Colleges representing more than 20 departments. Students working on graduate degrees represent a wide variety of disciplinary and interdisciplinary programs. The core of the Center's facilities are in the Seamans Center for the Engineering Arts and Sciences, but faculty members and students are housed across campus.

Research in this growing field at the UI over the past 15 years has led to significant contributions to large-scale genome and transcriptome sequencing, gene mutation discovery and numerous computational and analytical methods for analysis of genetic and molecular science systems. Cooperation with other research centers, as well as a number of existing cores and service units, is a hallmark of the functioning of the CBCB.

Center for Functional Genomics of Hypertension

Director: Curt Sigmund, PhD

The Center on Functional Genomics of Hypertension (CFGH) is a research center affiliated with the Department of Internal Medicine and the Cardiovascular Center and has as its primary goal the advancement of research in hypertension and related diseases, including obesity-associated hypertension. The Center was founded in 1995 to facilitate the use of molecular, genomic and genetic techniques in hypertension research and to attract major funding and outstanding trainees and faculty in this area to the University of Iowa. Members of the CFGH include Curt D. Sigmund, PhD (Center Director), Allyn L. Mark, MD, Kamal Rahmouni, PhD, Val C. Sheffield MD PhD, Anne E. Kwitek, PhD (starting September 1, 2007) and Martin D. Cassell, PhD. The center carries an annual operating budget to support center activities and a recruitment budget to identify and recruit energetic scientists to the University of Iowa. The CFGH was previously funded by the NIH in the form of a Special Center of Research (SCOR) on the Molecular Genetics of Hypertension. This SCOR was awarded to the University of Iowa in 1996 under the leadership of Dr. Mark and was competitively renewed in 2001 under the leadership of Dr. Sigmund. On June 1, 2007 the CFGH was awarded a 5-year \$10.1 million Program Project Grant (PPG) entitled "Genetic & Signaling Mechanisms in the Central Regulation of Blood Pressure" to identify mechanisms causing hypertension and hypertension associated with obesity.

Major research projects being pursued in the PPG include:

1) "Functional Significance of a Novel Intracellular Renin in the Brain" tests the hypothesis that intracellular generation of angiotensin in neurons by the action of intracellular renin provides the missing evidence completing the biosynthetic cascade for the production of neuronal angiotensin which then acts as a neurotransmitter signaling sympathetic transmission. The project will define the location and properties of intracellular renin-expressing neurons by testing the hypothesis that they co-express other components of the renin-angiotensin system, have cell bodies localized in nuclei controlling cardiovascular function and axons which project within known angiotensinergic neural pathways controlling cardiovascular function, and define the functional relevance of the intracellular renin pathway by testing the hypothesis that this pathway is a critical regulator of cardiovascular function.

2) "Leptin Receptor Signaling and Regulation of Sympathetic and Cardiovascular Functions" tests the hypothesis that interruption of leptin signaling through MAPK and STAT3, while promoting obesity, is associated with preservation of the renal sympathetic and arterial pressure actions of leptin. The goal of the project will be to test the hypotheses that: a) disruption of neuronal MAP kinase and leptin-receptor stimulation of STAT3 blocks the appetite suppressant and weight-reducing effect of leptin and the sympathetic response to brown adipose tissue (BAT), but is associated with preservation of the renal sympathetic nerve and arterial pressure actions of leptin, and b) site-specific disruption of leptin-induced STAT3 and MAP kinase signaling in the arcuate nucleus is associated with preservation of the renal sympathetic nerve activity and arterial pressure responses to leptin despite loss of weight reducing actions. In contrast, disruption of the leptin receptor in the arcuate nucleus abrogates all these responses.

3) "Mechanisms of Hypertension and Obesity in Mouse Models of a Human Obesity Syndrome" tests the hypothesis that central neurogenic mechanisms play a major

pathophysiological role in obesity and hypertension associated with deletion of BBS genes in mice. The goals of the project are to investigate the pathophysiological mechanisms leading to obesity in BBS-deficient mice with particular emphasis on the role of leptin resistance and the central nervous system, and by assessing the alterations in the hemodynamic, sympathetic and hormonal systems involved in blood pressure regulation in the models.

The CFGH successfully recruited Dr. Kamal Rahmouni to its faculty as an Assistant Professor in the tenure track in 2005 and is pleased to report the successful recruitment of the Dr. Anne Kwitek from the Medical College of Wisconsin to join the faculty as Associate Professor in the tenure track in the Department of Internal Medicine on September 1, 2007. Dr. Rahmouni is a gifted young cardiovascular neurophysiologist and molecular biologist with his primary interest on the signaling events in the central nervous system involved in appetite, obesity and hypertension. Dr. Rahmouni was recently awarded an R01 grant from the NIH which he turned back in order to accept greater funding as leader on Project 3 from the CFGH's recently awarded PPG. Dr. Kwitek is a talented human and animal geneticist with expertise in bioinformatics. Dr. Kwitek uses comparative genomics in her studies of hypertension and diabetes.

Center for Gene Therapy of Cystic Fibrosis and Other Genetic Diseases

Director: John Engelhardt, PhD

The Iowa Center for Gene Therapy was established in 1998 to promote research and training in molecular medicine with a focus on translational research using gene therapy approaches to treat inherited and acquired diseases. In this spirit, the center focuses on serving as a resource to facilitate interdisciplinary interactions between diverse basic and clinical science research laboratories through centralized administrative and technical support, as well as providing a forum for impromptu and formal exchanges of information and ideas. Diseases of the lung, cardiovascular system, muscles, brain, and skin are focus areas of research as well as the development of gene therapy vectors and the identification of disease-causing genes. The Center currently has 69 active faculty members, numerous trainees at all levels of study, and is linked to a PhD training program in Molecular Medicine through the Department of Anatomy and Cell Biology. The Center and the Carver College of Medicine supports a number of world-renowned research cores that provide excellent state of the art research infrastructure.

Center for Research on the Implementation of Innovative Strategies in Practice

Director: Gary Rosenthal, MD

The Center for Research in the Implementation of Innovative Strategies in Practice (CRIISP) was established in June 2004 through a \$3.6 million five-year award from the Department of Veterans Affairs (VA), as one of 15 VA Centers of Excellence in health services research nationally. The main objectives of CRIISP are to: 1) to support the development of innovative research proposals that advances understanding of strategies for improving health care delivery; and 2) nurture the development of new health services investigators. CRIISP focuses on interdisciplinary research and brings together more than 25 core and affiliate investigators from the Colleges of Medicine, Public Health, Nursing, Pharmacy, Liberal Arts, and Business. Research pursued by the CRIISP investigators specifically seeks to:

- eliminate unnecessary variations in health costs and quality;
- identify racial and ethnic disparities in care;
- identify barriers to implementing evidence-based clinical practices; and
- develop, test, and disseminate novel, yet feasible, interventions to improve quality and lower costs that can be reliably implemented in busy clinical practice settings.

CRIISP investigators are currently principal investigators on more than 20 research and career development awards from the VA HSR&D Service, NHLBI, NCRR, NIDDK, NIA, and Robert Wood Johnson Foundation. Research projects incorporate a spectrum of quantitative and qualitative methods, and emphasize clinical conditions for which there is both evidence to achieve a national consensus regarding best practices and clear gaps between evidence and practice. Projects are supported by core research staff who bring expertise in study coordination, survey design, biostatistics, health economics and policy, and data management and analysis of large health care databases. In addition, CRIISP has eight funded post-doctoral training positions for clinicians and non-clinician investigators.

Craniofacial Research Center

Director: Jeffrey Murray, MD

The Craniofacial Research Center builds upon a 40-year history of clinical and research studies on craniofacial anomalies at Iowa and continues the tradition established over the past decade of interdisciplinary and inter-institutional research that includes not only a broad-based internal constituency but collaborative projects and interactions with colleagues in the United States and overseas which offer access to novel populations and innovative techniques. The Craniofacial Center Collaboratory has been the beneficiary of long-term support from the NIH, private and university resources. Current activities are funded, in part through the NIDCR (P60 DE-13076-01) and the University of Iowa Craniofacial Anomalies Research Center.

Cystic Fibrosis Research Center

Director: Michael Welsh, MD

The overall goal of the Iowa Cystic Fibrosis Research Center is to understand Cystic Fibrosis (CF) from the level of the gene to the person and to use this knowledge to develop new therapies. Strategies for achieving this goal are:

A critical mass of investigators

The Center comprises a critical mass of basic and clinical scientists approaching key problems in CF. The Center is fortunate to have many extraordinary senior and junior investigators. Considered as individual scientists, they are outstanding. However, the Center is more than just the sum of these individuals because they interact exceptionally well in a dynamic, stimulating environment focused on CF. The approach is broad-based and multidisciplinary. Center investigators have made important discoveries in many areas of CF research, and their findings have helped lead the field, often in exciting new directions. Discoveries by Center investigators have also led to many potential new therapies and are hastening the transfer of basic knowledge to patients.

Flexibility

The Center emphasizes flexibility. It shifts resources as needed to rapidly seize research opportunities when they arise and to pursue recruitment possibilities. The Center's pilot and feasibility grants enhance opportunities to pursue new directions and attract young investigators. Program enrichment activities keep Center members aware of central issues, new directions, and collaborative opportunities.

Cores

The Center supports several Cores: a) *In Vitro* Models and Cell Culture Core, b) Morphology Core, c) Clinical Research Core, d) Bioinformatics Core and d) Gene Transfer Vector Core. These Cores provide specialized expertise, develop new methodologies, attract new scientists, and serve as a catalyst for CF research. Development of an Animal Core and Imaging Core are underway to seize opportunities presented by newly developed CF models.

Training

The Center supports fellowships in CF-related research. Several former fellows are now on faculty.

Interaction with the Clinical CF Center

The CF Research Center interacts closely with the Clinical Center to facilitate translation of basic science to patients and to encourage clinical research.

The Center has brought significant extramural support. In addition to a large number of individual NIH and foundation awards, the Center provided the impetus to attract support for several Programs and Centers.

George M. O'Brien Kidney Research Center

Director: John Stokes, MD

The NIH/NIDDK has funded an O'Brien Kidney Research Center at the University of Iowa for the past 10 years. The present Center is a program with the general theme of identifying the molecular mechanisms involved in the regulation of the epithelial Na channel (ENaC). The rationale for this effort is to broaden the scientific framework from which the mechanisms of salt-sensitive hypertension can be explored. The grant funds three regular projects, a small administrative core, and pilot and feasibility studies. The themes of the regular projects converge on aspects of ENaC regulation. Investigators for these three projects are Drs. John Stokes, Peter Snyder, and Baoli Yang. Two or three Pilot and Feasibility projects have been funded each year with good success in obtaining external funding from these initial efforts.

NIDDK has decided that the nature of the O'Brien Kidney Research Centers will change from project-based centers to Core Centers. Such Centers will require support for core activities that already have support from external sources. The planning for the renewal of this Center is underway and will include support for core facilities such as Microscopy Core, Gene Targeting Core, Vector Core, and a Clinical/Translational Core. Pilot and Feasibility studies will be an essential component of the new Center proposal and will involve an expanded program of research into basic and applied aspects of kidney disease, hypertension, and cell biology.

Helen C. Levitt Center for Viral Pathogenesis

Director: Jack Stapleton, MD

The Helen C. Levitt Center for Viral Pathogenesis and Disease serves as a living memorial to Ms. Levitt whose gift supports in perpetuity interdisciplinary activities directed to understanding the role of viruses in human disease, revealing mechanisms of viral pathogenesis, developing new approaches to viral disease prevention, diagnosis, and treatment, and improving professional and public understanding of the nature and impact of viral diseases.

The Helen C. Levitt Center for Viral Pathogenesis and Disease stands on three mission pillars of research, education and service. The Center integrates the research, educational and patient care efforts of over 30 faculty in four separate collegiate units within The University of Iowa (Medicine, Liberal Arts, Business Administration and the University Hygenic Laboratory). In the Carver College of Medicine, faculty members from 10 different departments are represented (Anatomy, Family Practice, Internal Medicine, Microbiology, Obstetrics and Gynecology, Pathology, Pediatrics, Pharmacology, Preventive Medicine and Environmental Health and Surgery). Faculty in the College of Liberal Arts (Department of Biology), College of Business (Department of Management Sciences) and the State Hygenic Laboratory are also represented in its founding membership. With related activities carried out by faculty in so many administrative units, the Helen C. Levitt Center for Viral Pathogenesis and Disease serves as a focus to promote cooperative efforts in the study of viral diseases throughout the University and support development of research, educational initiatives and innovative approaches to patient care.

Holden Comprehensive Cancer Center

Director: George Weiner, MD

The Holden Comprehensive Cancer Center at The University of Iowa is dedicated to bringing world class research and cancer care to Iowa, the Midwest, and beyond.

Not just a floor, or a building, or even confined to a single college, Holden Cancer Center coordinates all cancer-related research, education, and patient care throughout the university of Iowa by faculty from 38 departments in six colleges, as well as UI Hospitals and Clinics.

Founded in 1980, Holden Cancer Center:

- promotes interactive, high-quality cancer research
- provides high-quality health care related to the prevention, detection, and treatment of cancer
- educates cancer professionals and the citizens of Iowa about cancer

Important pieces of the Cancer Center patient care areas include:

- The John and Mary Pappajohn Clinical Cancer Center, located on the third and fourth floors of the Pappajohn Pavilion of UI Hospitals and Clinics, houses the adult patient care area of the Cancer Center.
- Children are treated at University of Iowa Children's Hospital, located at UI Hospitals and Clinics.
- The Breast Imaging area is on the third floor of the Pappajohn Pavilion.
- The Adult Blood and Marrow Transplantation unit is located on the seventh floor of the Roy Carver Pavilion.
- Patients are also seen in various department clinics including, Dermatology, Center for Digestive Diseases, Orthopaedics, Otolaryngology, Pediatrics, and Urology.

Research is conducted in laboratories throughout the University of Iowa campus. The Roland and Ruby Holden Cancer Research Laboratories, part of the Medical Education and Research Facility, allow the Cancer Center to integrate many researchers in close proximity to each other.

In 2000, the Cancer Center was recognized by the National Cancer Institute as an NCI-designated Cancer Center and received "comprehensive" status shortly thereafter. This comprehensive designation was renewed in 2005.

The NCI designation recognizes the research scientists, physicians, and other health care professionals for their roles in treating and caring for patients with cancer.

Huntington's Disease Center of Excellence

Directors: Jane Paulsen, PhD, Robert Rodnitzky, MD, Henry Paulson, MD

The Huntington's Disease Society of America Center for Excellence at the University of Iowa provides medical care, education and research opportunities to families in Iowa, Nebraska, Wisconsin, Illinois, Minnesota and South Dakota.

The directors of the HD Center for Excellence at the University of Iowa are Jane Paulsen, PhD, Robert Rodnitzky, MD, and Henry Paulson, MD. Paulsen, chair of the Center of Excellence committee for the Huntington's Disease Society of America, has pioneered work in neurobehavioral and brain imaging aspects of HD in pre-symptomatic subjects. Rodnitzky has led more than 50 studies in experimental therapeutics for patients with movement disorders, such as HD and Parkinson's disease. Paulson, a member of the HDSA's medical and scientific advisory board and the steering committee of the Coalition for the Cure, is recognized for his basic research on Huntington's disease and related genetic diseases.

Iowa Institute for Biomedical Imaging

Directors: Geoffrey McLennan, MD, Milan Sonka, PhD

Formerly the Program in Imaging Research, The Biomedical Imaging and Image Analysis Program recently established the Iowa Institute of Biomedical Imaging (IIBMI). The IIBMI was forged by a strong interdisciplinary group of established researchers from the Colleges of Medicine, Engineering, Liberal Arts and Sciences and Public Health and brings together researchers from all areas of medicine, including recognized programs in cardiovascular, pulmonary, neurological, psychiatric imaging and image analysis, and radiation treatment planning.

The Institute focuses on research and discovery in biomedical imaging at the University of Iowa under one umbrella, in a multi-disciplinary process, facilitating new external industry relationships, new grant opportunities, and new educational processes at both the undergraduate and post-graduate levels.

Institute for Clinical and Translational Science

Director, Gary Hunninghake, MD

The University of Iowa created the Institute for Clinical and Translational Science to serve as the University's overarching, academic structure for all clinical and translational research and training. The Institute establishes a multidisciplinary matrix to facilitate and support all clinical and translational science across the University's colleges. The Institute and its structure were formally approved by the State of Iowa Board of Regents in December 2006. The Institute is now recognized as a unique organization (org 21) within the University of Iowa with the Director reporting directly to the University Provost. Funding for the Institute will come from the Colleges of Medicine, Public Health, Liberal Arts, Pharmacy, Dentistry, and Nursing, the Office of the Vice President for Research, community healthcare organizations, and the NIH CTSA grant.

Plans for the Institute emerged from the University's efforts to significantly reorganize its clinical and translational research and training infrastructure-efforts recently accelerated by NIH roadmap emphasis on new bench-to-bedside research and patient care. Addressing these initiatives is paramount to Iowa's continued success as a premier biomedical research institution. The University's resources in support of clinical and translational research were carefully evaluated and items that require attention were identified. The following was concluded:

- The University's infrastructure for clinical and translational research needed to be consolidated and optimally designed to facilitate clinical studies
- The training programs for clinical and translational research needed to be integrated
- A structure to facilitate career development of faculty and trainees who wish to conduct clinical and translational research needed to be developed
- Bioinformatics resources supporting clinical research and training at the University must be refined and expanded
- Although the University has a strong tradition of interdisciplinary and intercollegiate research, and offers very few barriers to such research, additional incentives to stimulate collaborative research programs needed to be developed
- Mechanisms to foster partnerships and build trust with community physicians and to include them in the clinical research enterprise are essential
- Mechanisms must be developed to provide follow-up health care when a clinical trial or treatment ends
- Study results and outcomes needed to be shared with research participants and the larger community promptly and consistently

Institute Goals

1. To serve as the home for all aspects of the CTSA
2. To remove barriers to clinical and translational research and to stimulate new interactions and multidisciplinary research and training programs
3. To promote ethnic and gender diversity within all aspects of the Institute
4. To identify, recruit, and train outstanding scholars from diverse disciplines in the comprehensive principles and techniques of academic, patient-oriented research, including epidemiological and translational research and clinical trials

5. To provide short-term training to a wide variety of scientists interested in conducting clinical and translational research, including community researchers, study coordinators, and early-career researchers
6. To develop a network of Iowa communities integral to the Institute's research and education components
7. To aid in bridging basic and clinical research, and to bring these discoveries to Iowa's communities and beyond
8. To carefully monitor the progress of the Institute to ensure optimal use of the CTSA and State of Iowa resources, as well as to ensure the success of the Institute's research and education training programs
9. To integrate existing programs for clinical research training—including a variety of established clinical training programs; the University's NIH-funded K30, K12, and T32 programs; and the Graduate Program in Translational Biomedicine—and to increase collegial interactions among trainees
10. To integrate functions that support clinical and translational research, including regulatory support and drug development, essential research core support, pilot grants, and information technology
11. To provide an academic home and supportive environment for University faculty interested in clinical and translational research, including support for career development and promotion
12. To forge research partnerships with industry

Senator Paul D. Wellstone Muscular Dystrophy Cooperative Research Center

Director: Kevin Campbell, PhD

Muscular dystrophies are a diverse group of inherited disorders characterized by progressive muscle weakness and wasting. The University of Iowa Paul D. Wellstone Muscular Dystrophy Cooperative Research Center is exploring therapeutic strategies for the treatment of various muscular dystrophies by enabling translational research on muscular dystrophies and providing advanced diagnostic services. The MDCRC is composed of three research projects, three cores and investigators with a proven track record of excellence and collaboration. The Center researchers' studies and facilities explore basic biological mechanisms that relate to possible treatments for muscular dystrophies, facilitate translational research on muscular dystrophies, and provide advanced diagnostic services to patients and clinical trial participants. The Director and Co-director, Kevin Campbell and Steven Moore, are investigators with established records in basic, translational, and clinical research on muscular dystrophy.

Iowa Comprehensive Lung Imaging Center

Directors: Eric Hoffman, PhD, Geoffrey McLennan, PhD, Milan Sonka, PhD

The Iowa Comprehensive Lung Imaging Center represents a dream held by a group of loosely knit collaborators who were joined together with a common interest in the use of quantitative imaging techniques to better understand the normal lung and the changes leading to and defining pathologic states. Each member of this group were well recognized in their own right and their backgrounds were diverse and included Physiology, Medicine, Radiology, Anesthesiology, Mathematics, Electrical Engineering, and Biomedical Engineering. While each of these individuals ran successful laboratories, there was a clear need for a dedicated imaging center which would serve as a gathering place and would provide these individuals access to state-of-the-art facilities in which to accomplish their research. This facility would provide for a means of interacting with and influencing industrial partners in regards to the future directions of imaging technologies, and it would provide a synergy serving to rapidly advance both the field of lung imaging and the understanding of the lung.

With this dream in hand, and after traveling the world in conjunction with one scanner manufacturer seeking to find a very large sum of money to build the "ultimate" dynamic volumetric CT scanner, the stars seemed to align. Simultaneous to the emergence of multidetector row CT, NIH announced the creation of their Bioengineering Research Partnership grant program. Over dinner at a Mexican restaurant at the SPIE Medical Imaging meeting, the team made a pact to submit a BRP proposal with only weeks left before the deadline. Through sleepless nights and with e-mails sent back and forth across the country, with write-ups completed on vacations, in between classes, and whenever else a moment could be stolen, the team successfully applied for and received NIH HL-064368: Image and Model Based Analysis of Lung Disease. The project sought to establish a normal atlas/model of the human lung based upon newly developing methods of x-ray CT imaging. The original partnership was formed with Picker International and has more recently joined efforts with Siemens Medical.

With the advantages of synergy and early success, The Center has been grateful that numerous other companies, leaders in their respective fields, including Olympus, Aventis, Amersham, Puritan-Bennett, Diversified Diagnostic Products Inc., Emphasys Medical, and Stereotaxis have joined in these efforts.

Sensing the growing importance of these efforts, the University of Iowa Carver College of Medicine working with the Departments of Radiology and Medicine have substantially contributed to the establishment of the facilities and infrastructure which provide a world class environment for the current and future nurturing of this growing team of international researchers focused on understanding the lung.

Specialized Center of Research (SCOR) in Osteoarthritis

Director: Joseph Buckwalter, MD

The University of Iowa Specialized Center of Research (SCOR) in Osteoarthritis (OA) will support and coordinate a multidisciplinary group of experienced investigators in clinical, bioengineering, cell and molecular biology research to advance understanding of the pathogenesis of post-traumatic OA, and develop innovative approaches for preventing and treating this disease. Joint trauma dramatically increases the risk for development of OA. Yet, little work has been done on the pathogenesis and prevention of post-traumatic OA. For these reasons, a clear and urgent need exists to improve the understanding of this common and disabling disorder and the ability to prevent and treat it. The human ankle joint provides a unique opportunity for the study of post-traumatic OA because of the low risk of primary OA and the relatively high risk of post-traumatic OA. This SCOR will test the hypotheses that: 1) exceeding critical levels of acute energy absorption and chronic articular surface contact stress causes post-traumatic ankle OA, 2) the risk of OA following joint trauma increases with age as a result of decreased ability of chondrocytes to restore or maintain the articular cartilage, and 3) decreasing articular surface contact stress will decrease the risk of post-traumatic OA and provide effective treatment for ankle OA. The specific projects will include: 1) a prospective clinical study to define the relationships between acute energy absorption and chronic articular surface contact stress and the risk of post-traumatic ankle OA, 2) a prospective clinical study of the effects of decreasing articular surface contact stress in osteoarthritic ankles, 3) basic scientific and experimental investigations of the pathogenesis of post-traumatic OA, and 4) basic *in vitro* investigations of the effects of age and mechanically induced oxidative stress on chondrocyte senescence and the effects of anti-oxidant defenses on chondrocyte senescence.

These projects will contribute significantly to the understanding of the pathogenesis of post-traumatic OA and will lay the foundation for new methods of preventing and treating this disease, as well as other forms of OA. As a result of the integrated multi-disciplinary scientific approach focused on a well-defined research theme, this SCOR will create a national resource for rapid advancements in the understanding of the pathogenesis, prevention, and treatment of post-traumatic osteoarthritis.

Center on Aging

Director: Robert Wallace, MS, MD

The University of Iowa Center on Aging is an interdisciplinary center that serves as a state and university-wide resource to address the needs of older Iowans. It proceeds from the global view that aging is a normal, lifelong process, involving all dimensions of life. As a department in the Roy J and Lucille A Carver College of Medicine with co-sponsorship by the College of Public Health, the Center brings together people and resources across the state and from the University's eleven colleges to help advance aging-related research, education, healthcare, public policy and other areas associated with the well-being of older adults.

Established in 1990, the University of Iowa Center on Aging is helping to redefine the aging experience by fostering research and translating findings for use in education, public policy and services that provide practical benefits to older adults and their families.

Outreach and collaboration are central to the Center's goals and activities. The Center offers leadership, consultation and resources to diverse community, university, state and national audiences. These efforts are intended to help improve services and programs, increase training and expertise in aging, guide public policy and provide timely information that supports informed decision-making. Additionally, the Center's links with local, state and national providers and organizations in aging have expanded resources that enable older individuals to remain in and continue to contribute to their community.