

# Kansas State University



## Department of Kinesiology



**Graduate  
Education  
and  
Research  
Programs**



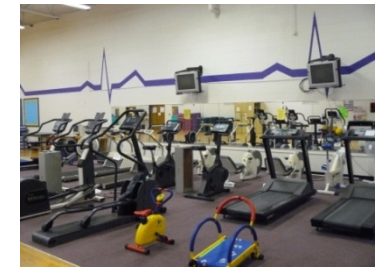
## Graduate Studies in Kinesiology

The Department of Kinesiology has assembled an internationally known group of faculty involved in the study of the physical activity. The Department includes research and graduate education groups in exercise physiology and a public health physical activity. Our faculty is engaged in wide variety of study; from the role of kinetics of muscle oxygen exchange in health and chronic heart failure, to the contribution of physical inactivity to the development and maintenance of childhood obesity. Projects range from the use of animal models to study disease states to the testing of novel intervention programs designed to change the health of whole communities. The common theme that binds us together is the study of physical activity and health.

### Physiological Basis of Physical Activity

The Exercise Physiology Graduate Education and Research Group of five internationally known scholars who mentor graduate students and teach graduate courses is widely considered one of the top exercise physiology groups in a Kinesiology Department in the U.S. Exercise physiology is the study of the acute and long-term responses of the body to the challenges of exercise or physical work. Acute responses are the alterations in physiological function that occur during a bout of exercise, such as increased heart rate, ventilation, and body temperature. The long term benefits produced by regular involvement in an exercise program, include such adaptations as increased muscular strength and endurance, reduced body fat, enhanced aerobic capacity and reduced risk of coronary heart disease. The impact of detrained states and the consequences of diseases such as arteriosclerosis, diabetes, and heart failure are also critical to the study of the relationship between physical activity and health. Research and graduate training focus on the physiological, biochemical and molecular mechanisms underlying these processes and the influence of exercise on health and disease.

Students interested in exercise physiology may pursue a Master of Science degree in Kinesiology with an emphasis in the physiological basis of physical activity. The Dept. of Anatomy and Physiology collaborates with Kinesiology Faculty to offer Ph.D. degree emphasizing exercise physiology. The Department of Human Nutrition also collaborates with Kinesiology to train Ph.D. students as well. Students interested in the M.S. or Ph.D. programs in exercise physiology are encouraged to contact a faculty member of interest.



### Public Health Physical Activity

Five graduate faculty members have developed one of the first Kinesiology graduate programs in Public Health Physical Activity (exercise psychology, social epidemiology, and physical activity promotion) in the U.S. The public health physical activity program focuses on 1) identifying the social, psychological, and cultural factors that determine physical activity involvement, and 2) evaluating strategies to promote physical activity through rigorous clinical and community trial studies. Students in public health physical activity may pursue a Master of Science degree in Kinesiology or a Master of Public Health (MPH) degree. The MPH is an interdepartmental program with faculty participants from many academic departments of the university (see <http://www.k-state.edu/mphealth/> for information). The 42 semester hour program is designed to provide graduate-level education for individuals currently employed or anticipating a career in the field with an emphasis in public health physical activity or public health physical activity and nutrition.

The Department of Human Nutrition also collaborates with Kinesiology to train Ph.D. students. Students interested in the M.S., MPH, or Ph.D. programs in public health physical activity are encouraged to contact a faculty member of interest.

### ACSM Certification Tracks

The K-State Kinesiology Graduate program can be tailored to students interested in professional opportunities in hospital, corporate, or community preventive and rehabilitation exercise settings. Students participate in course work, research and internships for preparation for certification by the American College of Sports Medicine as a Clinical Exercise Specialist or by ACSM/NSPAPPH as a Physical Activity in Public Health Specialist.

## M.S. in Kinesiology Requirements

Students choose from one of two degree options: **thesis** (30 hours) or **course work** (36 hours). General program requirements:

	HOURS
<b><u>Core</u></b>	
<b>Research Core</b>	6
KIN 815 Research Methods in Kinesiology	
One Statistics course (e.g. STAT 702, STAT 703, PSYCH 830)	
<b>Kinesiology Core</b>	6
KIN 800 Advanced Physiology of Exercise	
KIN 830 Public Health Physical Activity	
<b>Total Core</b>	12
<b><u>Thesis Option</u></b>	
<b>Support Work</b>	12
Kinesiology courses 600 and above; and approved courses outside the department	
<b>Thesis</b>	6
<b>Total Thesis (Minimum)</b>	30
<b>OR</b>	
<b><u>Course Work Option</u></b>	
<b>Core</b>	12
<b>Support Work</b>	24
Kinesiology courses 600 and above; and approved courses outside the department	
<b>Total Course Work (Minimum)</b>	36

## Selected Available Courses

- KIN 600 - Psychology of Physical Activity
- KIN 601 - Cardiorespiratory Exercise Physiology
- KIN 602 - Gender Issues in Sport and Exercise
- KIN 603 - Cardiovascular Exercise Physiology
- KIN 604 - Exercise and Mental Health
- KIN 605 - Topics in the Biological Basis of Kinesiology
- KIN 606 - Topics in the Behavioral Basis of Kinesiology
- KIN 607 - Muscle Exercise Physiology
- KIN 608 - Body Image, Eating Disorders & Obesity
- KIN 609 - Environmental Physiology
- KIN 610 - Program Planning and Evaluation
- KIN 612 - Built Environment and Physical Activity
- KIN 625 - Exercise Testing and Prescription
- KIN 635 - Nutrition and Exercise
- KIN 655 - Fitness Promotion
- KIN 657 - Therapeutic Use of Exercise in the Treatment of Disease
- KIN 792 - Health-Fitness Instructor Internship
- KIN 793 - Internship/Public Health Physical Activity
- KIN 796 - Topics in Exercise Physiology
- KIN 797 - Topics in Public Health Physical Activity Behavior
- KIN 797 - Child Development of Healthful Eating and Activity
- KIN 800 - Advanced Physiology of Exercise
- KIN 805 - Physical Activity and Human Behavior
- KIN 808 - Social Epidemiology of Physical Activity
- KIN 815 - Research Methods in Kinesiology
- KIN 818 - Social and Behavioral Bases of Public Health
- KIN 820 - Physical Activity Leadership
- KIN 830 - Advanced Public Health Physical Activity
- KIN 840 - Public Health Field Experience
- KIN 845 - Exercise Adherence
- KIN 896 - Independent Study in Kinesiology
- KIN 897 - Research in Kinesiology
- KIN 898 - Master's Report
- KIN 899 - Master's Thesis

## Application

### Required application materials:

- KSU Graduate School Application/Information Form completed in full on-line or hard copy and signed at the bottom of the front page. (<http://www.k-state.edu/grad/application/index.htm>)
- One Official copy(s) of your transcript(s) from each college or university which you have attended. (Copies of transcripts furnished directly to you cannot be accepted by the Graduate School. Please have your schools send your transcripts directly to our office.)
- A written statement (approximately 600-900 words) of professional/career objectives and research interests, and a copy of your vita. The **Statement of Professional/Career Objectives** should consist of a description of your background, why you want to join our program, what you expect to do with your degree, and which faculty member you would like to be your major professor. More information can be found at our website: <http://www.k-state.edu/kines/graduate/>
- Three letters of recommendation from former/current instructors, employers, or other professionals in a position to evaluate your potential for graduate study.
- Official scores on the Graduate Record Exam. Please include a duplicate copy of your scores in your application materials.
- Applications are accepted at any time. For full consideration for financial support, please apply by November 1 (Spring admission) or March 1 (Fall admission)
- Application fee:
  - U.S. citizens and permanent residents - \$30.00
  - International - \$55.00 U.S. dollar application fee in the form of a money order or cashier's check made payable to Kansas State University Graduate School.

All materials should be sent to:  
Graduate Coordinator  
Kansas State University  
Department of Kinesiology  
1A Natatorium  
Manhattan, Kansas 66506.

## Graduate Assistantships

Graduate teaching and research assistantships are available each year for qualified candidates. Teaching Assistant duties consist of teaching and related activities associated with undergraduate laboratories. Research Assistant duties consist of working in a laboratory under the direction of a major professor. The total time commitment is approximately 20 hours per week and includes a tuition waiver and stipend.

To download an application for a teaching assistantship, refer to our website at <http://www.kstate.edu/kines/graduate/assistantships.html>

To learn about graduate research assistantships, contact a faculty member directly for more details.



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[www.ksu.edu/kines](http://www.ksu.edu/kines)*



## Research Laboratories

Graduate students are provided many opportunities to work in both research and physical activity service settings. Exercise psychology, social epidemiology, community health behavior, and human exercise physiology laboratories are located within the Ahearn complex. The department's animal research laboratories are housed within the Department of Anatomy and Physiology, which is located at the College of Veterinary Medicine.

### Cardiorespiratory Exercise Laboratory

(Timothy I. Musch and David C. Poole, Co-directors)



**David Poole, Ph.D., D.Sc.**  
(Univ. of California Los Angeles)  
Professor of Exercise Physiology  
Co-director, Cardiorespiratory  
Exercise Laboratory

#### Research Interests:

- Oxygen transport
- Cardiorespiratory diseases
- Muscle microcirculation
- Respiratory physiology

#### Contact Information:

**Office:** Coles 131  
**Office Phone:** (785) 532-4529  
**Office Fax:** (785) 532-6486  
**Email:** dpoole@vet.ksu.edu



**Timothy I. Musch, Ph.D.**  
(University of Wisconsin)  
Professor of Exercise Physiology  
Co-director, Cardiorespiratory  
Exercise Laboratory

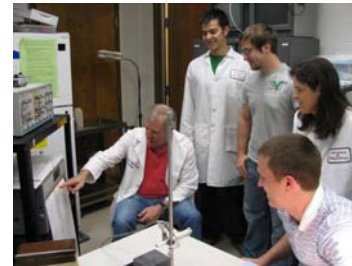
#### Research Interests:

- Regulation of skeletal muscle blood flow
- Oxygen transport in skeletal muscle in health & disease
- Chronic heart failure (CHF)

#### Contact Information:

**Office:** Coles 128 (Office)  
Coles 122 (Lab)  
**Office Phone:** (785) 532-4523  
**Lab Phone:** (785) 532-4494  
**Office Fax:** (785) 532-6486  
**Email:** musch@vet.ksu.edu

The Cardiorespiratory Exercise Laboratory, housed in the College of Veterinary Medicine complex, provides numerous opportunities to study the physiology of physical activity in health and disease through a variety of animal models. Research projects undertaken by the Cardiorespiratory Laboratory emphasize pulmonary gas exchange and the relationship between skeletal muscle structure and oxygen delivery at the microcirculatory levels. Various animal model experiments, ranging from treadmill running studies to examination of the response of muscle blood vessels to various drugs, are key to understanding the skeletal muscle blood flow and oxygen exchange abnormalities and dysfunction found in muscle that accompany major disease conditions such as diabetes, chronic heart failure and healthy aging. The 1,200 square foot facility includes state-of-the-art equipment such as intravital microscopy and phosphorescence quenching. Historically, collaborations across the Veterinary Medical School also have permitted the study of large animals such as thoroughbred horses and elephants. The laboratory has acquired more than 3.5 million dollars in funding and contracts.



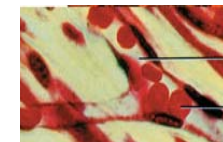
Dr. Tim Musch with (left-to-right) students Daniel Hirai, Peter Schwargerl and Steven Copp and research technician Sue Hageman collect muscle force data



Research subject helping us understand the effects of aging and disease on muscle blood flow and performance



Dr. David Poole with a powerful intravital microscope adapted to study red blood cell movement in the smallest blood vessels – capillaries – each less than 1/10<sup>th</sup> the thickness of a human hair! (seen at right)



## Cardiovascular and Thermal Physiology Laboratory

(Brett Wong, Director)



**Brett Wong, Ph.D.**

(University of Oregon)

Assistant Professor of Exercise  
Physiology

Director, Cardiovascular and  
Thermal Physiology Laboratory

### Research Interests:

- Cardiovascular responses to heat stress in humans
- Cardiovascular responses to gravitational stress in humans

### Contact Information:

**Office:** Ahearn 207

**Office Phone:** (785) 532-4843

**Office Fax:** (785) 532-6486

**Email:** bwong@ksu.edu

Current projects in the lab are focused on understanding the mechanisms by which skin blood flow increases in response to local heating and in response to heat stress. Local heating of the skin is frequently used as a clinical tool to test the vascular health in various patient populations. Increases in skin blood flow, along with sweating, are the primary means by which humans defend against high body temperatures during heat stress. We are currently investigating the role of capsaicin-sensitive afferent sensory nerves during local and whole body heating. These sensory nerves are activated by heat and capsaicin, which is the active ingredient in hot chili peppers. The goal is to understand how sensory nerves contribute to skin blood flow during local and whole body heating as well as how different molecules that are produced in the skin can activate the sensory nerves to cause blood flow to increase.

A secondary area of research is to understand how changes in posture or simulated microgravity affect blood pressure regulation.

The lab utilizes state-of-the-art techniques, including: laser-Doppler flowmetry to measure skin blood flow; microdialysis for the local delivery of pharmacological agents to the skin; local skin heating; water-perfused to regulate and change body temperature; thermocouples for measuring skin temperature; head-up and head-down tilt to change posture and simulate microgravity.



**Left:** Subject undergoing a whole-body heating protocol. The subject is equipped with a water-perfused suit to control body temperature, microdialysis fibers for local deliver of drugs to the skin, laser-Doppler flow probes to measure skin blood flow, electrocardiogram, and sublingual temperature probe. **Right:** Close up of microdialysis fibers in the skin. Up to four fibers are placed in the forearm and allow for local delivery of various drugs to the skin.



Subject undergoing head-up tilt via an automatic tilt table. Head-up tilt is used to study the cardiovascular responses to upright posture while head-down tilt is used to mimic microgravity. Subject is equipped with an electrocardiogram and a finger cuff that allows for beat-by-beat measurement of blood pressure, heart rate, and other cardiovascular variables.

## Human Exercise Physiology Laboratories

(Craig Harms and Tom Barstow, Co-Directors)



**Craig A. Harms, Ph.D.**

(Indiana University)

Associate Professor of Exercise  
Physiology

Co-Director, Human Exercise  
Physiology Laboratory

### Research Interests:

- Cardiopulmonary responses/ interactions/ limitations to exercise including respiratory muscle work, gas exchange and ventilation
- Physiological gender differences
- Pediatric cardiopulmonary responses to exercise

### Contact Information:

**Office:** Ahearn 208

**Office Phone:** (785) 532-0706

**Office Fax:** (785) 532-6486



**Thomas J. Barstow, Ph.D.**

(University of California at Davis)

Professor of Exercise Physiology

Graduate Coordinator

Co-Director, Human Exercise

Physiology Laboratory

### Research Interests:

- Pulmonary and capillary gas exchange
- Coupling of muscle blood flow to metabolism
- Fatigue
- Endothelial function in health and disease
- Efficiency of exercise
- Effects of antioxidants on fatigue

### Contact Information:

**Office:** Ahearn 206A

**Office Phone:** (785) 532- 0712

**Office Fax:** (785) 532-6486

**Email:** tbarsto@ksu.edu

## Dr. Craig Harms' Laboratory Activities

The primary research interests in my lab are to determine the limits of the human cardiopulmonary control system for gas exchange, respiratory muscle pressure development and for ventilatory output across genders in health and in disease through the lifespan. I am also interested in how men and women differ in these responses. Recent research projects include 1) how prepubescent boys and girls differ in their ventilatory response during exercise and how this affects exercise performance, 2) how increased body fat and a sedentary lifestyle may lead to the development of exercise induced asthma in children, 3) the effect of fish oil supplementation on airway inflammation, 4) the influence of dietary antioxidants on diaphragmatic fatigue and exercise performance, 5) if high intensity interval training improves respiratory muscle strength and airway function. The outcomes from these projects will help in our overall understanding of how the cardiopulmonary system functions during exercise and help identify limitations in this system in both health and disease.



## Dr. Tom Barstow's Laboratory Activities

The primary research interests in my laboratory focus on muscle and cardiovascular responses to exercise, including capillary gas exchange, and on the metabolic and circulatory changes that describe the progression of insulin resistance from health to diabetes. We have developed a battery of noninvasive techniques, including breath-by-breath gas exchange, near infrared spectroscopy and vascular ultrasound, with which to examine the coupling of oxygen delivery to oxygen utilization by skeletal muscle during exercise in humans. In addition, we are adapting these noninvasive techniques to examine the macro- and microvascular responses of skeletal muscle during ischemia-reperfusion.





## Public Health Physical Activity Behavior Laboratories

### Physical Activity and Public Health Laboratory

(Dr. Melissa Bopp, Dr. Elizabeth Fallon and, Dr. Andrew Kaczynski, Co-directors)



#### **Melissa Bopp, Ph.D.**

(University of South Carolina)  
Assistant Professor of Physical Activity & Public Health Behavior  
Co-director, Physical Activity and Public Health Laboratory

#### **Research Interests:**

- Understanding and promoting physical activity in underserved populations
- Translation of research to practice
- Faith based health promotion



#### **Elizabeth Fallon, Ph.D.**

(University of Florida)  
Assistant Professor of Physical Activity & Public Health Behavior  
Co-director, Physical Activity and Public Health Laboratory

#### **Research Interests:**

- Theory based interventions for adoption and maintenance of physical activity
- Reducing health disparities in underserved populations

#### **Contact Information:**

**Office:** Natatorium 8D  
**Office Phone:** (785) 532-7287  
**Office Fax:** (785) 532-6486  
**Email:** efallon@ksu.edu



#### **Andrew Kaczynski, Ph.D.**

(University of Waterloo)  
Assistant Professor of Physical Activity & Public Health Behavior  
Co-director, Physical Activity and Public Health Laboratory

#### **Research Interests:**

- The effect of the built environment on physical activity
- Parks and recreation and community health
- Social marketing of physical activity

#### **Contact Information:**

**Office:** Natatorium 8C  
**Office Phone:** (785) 532-0709  
**Office Fax:** (785) 532-6486  
**Email:** atkaczyn@ksu.edu

This laboratory's mission is to conduct research to understand and promote physical activity in a variety of settings and populations through community-based approaches. Lab activities include qualitative and quantitative methods of data collection, intervention development and design, evaluation of outcomes and processes, and analysis. The lab philosophy includes the consideration of community-based participatory methods, culturally tailored programs and studies, and dissemination and sustainability of evidence-based programs. Other interests include examining the role of parks and recreational facilities in facilitating opportunities for active living.





## Youth Health Behavior Research Laboratory

(Dr. David Dzewaltowski, Director)



**David Dzewaltowski, Ph.D.**

(University of Iowa)  
Department Head  
Professor of Public Health  
Physical Activity

### Research Interests:

- Media, environmental, and psychosocial influences on physical activity and healthful eating in children
- Development and evaluation of school and out-of-school obesity prevention programs

### Contact Information:

**Office:** Natatorium 8  
**Office Phone:** (785) 532-7750  
**Office Fax:** (785) 532-7733  
**Email:** dadx@ksu.edu



The Youth Health Behavior Research Laboratory aims to identify media, environmental, behavioral, and psychosocial influences on physical activity and healthful eating in children. Laboratory research teams draw on this information to develop and evaluate community-based programs to prevent obesity.

Dr. Dzewaltowski mentors students interested in research or practice in public health physical activity or exercise psychology, with a focus on the development of physical activity and healthful eating across childhood and adolescence. Faculty, staff, and students working in the laboratory adopt a behavioral epidemiology approach that includes four phases: 1 -develop measures of physical activity and nutrition; 2 - identify influences on physical activity and nutrition; 3 -evaluate interventions to change behavior; 4 - translate research to practice. While all phases of behavioral epidemiology are examined, current studies are focused on the big picture question of whether the impact of media and environmental influences on health behavior can be buffered by building skills, proxy efficacy, and practices of adults and children to develop healthful behavior settings. Targeted adults include parents and leaders of youth development settings. Targeted children include preschool age (3-5 year olds), elementary school age, and adolescents. Targeted settings include schools, after-school programs and clubs, and homes.

The laboratory has had significant funding for research on physical activity and healthful eating in children for over 10 years from agencies such as NIH, USDA, Sunflower Foundation, and the Health Fund. The 750 square foot laboratory performs data input, data management, and data analysis functions. For data collection, the Lab has several measurement (accelerometers, pedometers), data processing (high speed optical scanner and Teleform survey software), and data analysis (SAS, SPSS, HML, EQS) tools. The laboratory includes several graduate student workstations, a data input workstation, meeting area, and secure data storage room. The Youth Health Behavior Research Laboratory is also supported by the K-State motor pool for community-based data collection and intervention.



## Kinesiology Social Epidemiology Laboratory

(Dr. Mary A. McElroy, Director)



### Research Interests:

- Social epidemiology of physical activity and health
- Social justice and health
- African American health
- Social institutions

### Mary A. McElroy, Ph.D.

(University of Maryland)  
Professor of Public Health  
Physical Activity Behavior  
Director, Social Epidemiology  
Laboratory

This laboratory provides students with an opportunity to study trends in physical activity participation related to social (e.g., education, social class, work and family status) and demographic factors (e.g., age, gender, and ethnic groups). The primary focus is on secondary analysis of large national surveys, which include The Panel of Income Dynamics, Midlife Development in the United States (MIDUS), and the National Health and Nutrition Examination Survey (NHANES).

## Instructors

### • Rob Pettay, Ph.D.



#### Courses Taught:

KIN 310: Measurement and Research in Kinesiology  
KIN 220: Biobehavioral Bases of Physical Activity  
KIN 320: Motor Learning & Development

KIN 590: Psychological Dynamics of Physical Activity

KIN 591: Psychology of Exercise and Sport Injury

KIN 592: Personality in Sport and Exercise

### • Chris Bopp



#### Courses Taught:

KIN 520: Practicum/Fitness Setting  
KIN 625: Exercise & Test Prescription  
KIN 330: Biomechanics  
KIN 792: Health Fitness Instructor/  
Internship

### • Lauren Hammel



#### Course Taught:

KIN 398: Anatomy & Physiology

### • Christian Larson



#### Courses Taught:

KIN 398: Anatomy & Physiology Lab  
KIN 336: Exercise Physiology Lab  
KIN 220: Biobehavioral Bases of Physical  
Activity

## K-State and Manhattan Area

Kansas State University, a modern and comprehensive research, land-grant institution of higher education, is committed to quality programs and is responsive to a rapidly changing world and to the aspirations of an increasingly diverse society.



Founded in 1863, KSU is located on a 664 acre campus in Manhattan. It shares responsibilities for developing human potential, expanding knowledge, enriching cultural expression, and extending its expertise to individuals, business, education, and government.

Research and other creative endeavors comprise an essential component of the University's mission. These efforts, with support, are conducted in an atmosphere of open inquiry and academic freedom to commit to broad based programs in graduate education at both the master's and doctoral levels.



The University sponsors numerous academic, cultural, and athletic events. The campus is convenient to both business and residential areas. Adjacent to KSU is Aggieville, a shopping district of coffee shops, restaurants, clothing stores, gift shops and night clubs. Tuttle Creek State Park, a recreation area with 112 miles of shoreline and nearly 16,000 surface acres of water offers activities such as camping, fishing, sailing, and windsurfing. The Chester A. Peters Recreational center includes A/C, remodeled and expanded areas including racquetball courts, squash courts, gyms for basketball, volleyball, and badminton, and



tennis courts. The facility also has areas for weight training and aerobic conditioning machines aerobic dance, tracks, combative room, locker rooms with saunas, and a big screen video lounge. KSU is also home to the new Colbert Hills Golf course, designed by Jim Colbert, a professional golfer and KSU alumnus.

KSU is a member of the Big 12 athletic conference and provides numerous opportunities for students to be spectators at intercollegiate sport competitions.



The "Little Apple," with a population of 50,000 is a classic college town with a zoo, a mall, 21 parks, and a recreation trail that circles the city. Manhattan is located just off interstate 70 in the scenic Flint Hills of northeast Kansas, approximately 125 miles from Kansas City.





**Kansas State University**  
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Kansas State University is committed to nondiscrimination on the basis of race, sex, national origin, disability, religion, age, sexual orientation, or other nonmerit reasons, in admissions, educational programs or activities and employment (including employment of disabled veterans and veterans of the Vietnam Era), as required by applicable laws and regulations. Responsibility for coordination of compliance efforts and receipt of inquiries concerning Title VI of the Civil Rights Act of 1964, Title IX of the Educational Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, the Age Discrimination Act of 1975, and the Americans with Disabilities Act of 1990, has been delegated to Clyde Howard, Director of Affirmative Action, Kansas State University 214 Anderson Hall, Manhattan, KS 66506-0214, 785-532-6220; (TTY) 785-532-4807.