

HHP TODAY**The Department of Health and Human Performance**

Spring 2009 | Volume 3 | Issue 2

from the Chair

Welcome to the 2009 spring issue of the HHP Today newsletter. I invite you to take a few minutes to read all about the exciting accomplishments our faculty and students have recently made, and to check out the myriad opportunities they've been taking advantage of lately.



You will note that we have branched out into the Texas Medical Center (TMC) by opening the new Center for Neuromotor and Biomechanics Research (CNBR).

Get acquainted with our new faculty members: Dr. Simpson, Dr. Paloski and Dr. Liu, and get the latest on the new master's of science in human nutrition that HHP will begin offering this fall.

What I like about being a part of the health and human performance endeavor is the broad impact that we make beyond the classroom and lab. Our students are making a difference in the community before they graduate, and HHP's diverse faculty and curricula prepare our many graduates for real-world experiences.

UH is more committed than ever to providing a greater number of opportunities for undergraduates to participate in research throughout their academic career, and I can assure you that HHP will be at the forefront of the university's efforts in this area.

We want to keep you in the loop after you get out into the real world, and one of the ways we do that is through the current events link on the HHP website. Visit us at <http://hhp.uh.edu/Currentevents/>.

*Dr. Charles Layne,
HHP Department Chair*

HHP Establishes Presence in the Medical Center

HHP has established a presence in the world renowned Texas Medical Center through the newly formed CNBR.

The center is located in the National Center for Human Performance (NCHP) at the TMC. "This is the culmination of years of work, and marks the beginning of a new era in research for the University of Houston and for HHP," said Dr. Layne, professor and department chair.

The CNBR is a branch of our Laboratory of Integrated Physiology (LIP), which was formed 4 years ago as a fully-equipped human performance, biochemistry and physiology lab capable of performing a variety of human performance tests. The LIP accommodates research from the cellular level up to the system level while applying that study to muscle groups, cardiovascular, nervous and immune systems, and other areas of physiological and bioengineering disciplines.

Some of the department's faculty and graduate students have been performing neuromotor research for over 15 years. Recent faculty additions have not only expanded this capability, but enhanced it with biomechanists, exercise physiologists and psychologists.

The other skill sets necessary to develop an effective translational research team in neuromotor control are the clinical medicine experts who are available in the nearby TMC. Last summer HHP made positive steps toward establishing collaborative relationships with clinical researchers from TMC (and gaining access to their patient populations) by leasing 2,700 square feet of lab space in the NCHP on the John McGovern Campus of the TMC, and moving its neuromotor and biomechanics assessment equipment from the LIP into the CNBR.

"We're hopeful that our presence in the NCHP will provide a focal point for multidisciplinary studies related to human neuromotor control systems," said CNBR director and UH professor, Dr. William Paloski. "By bringing together scientists, engineers and clinicians in this way, we work to improve the quality of life for those disabled by the effects of injury, disease or aging."



"We're excited about the caliber of research and research partners," Layne said. "By extension, our students will have opportunities to work alongside seasoned investigators who may one day become colleagues."

To learn more about the new CNBR, visit www.hhp.uh.edu/CNBR, or e-mail Dr. William Paloski at whpaloski@uh.edu.

CENTER for NEUROMOTOR
and BIOMECHANICS RESEARCH

CNBR

FOCUS ON FACULTY

Dr. Rebecca E. Lee



Dr. Rebecca E. Lee

The environmental and individual determinants of physical activity, along with the dietary habits and obesity prevention practices in minority and underserved populations, form the foundation for the research of Associate Professor Rebecca Lee.

Prior to joining the HHP faculty in 2004, Lee was an assistant professor at the University of Kansas Medical Center and, before that, was a postdoctoral fellow at the Stanford University School of Medicine. She earned her Ph.D. at the University of Maryland–Baltimore County, and received her B.A. and M.A. degrees from San Diego State University.

Dr. Lee has received numerous awards for her research from various universities and organizations, and serves as the director of the Texas Obesity Research Center (TORC). The center's mission is to conduct basic and applied research in obesity prevention and control. TORC's inaugural obesity conference was held on campus April 9–10, 2009.

Dr. Lee is excited about TORC's International Health Challenge, which is now active in the 3-D virtual world of Second Life. Membership is free and anyone can join the international community to explore the virtual campus, participate in concerts, chat with other residents, experience learning opportunities and contribute to research efforts.

Lee is principal investigator on the project: **Understanding Neighborhood Determinants of Obesity (UNDO)**. Their work combines theory and techniques drawn from behavioral medicine, community psychology, geography, policy science, social ecology and social marketing in ethnic minority populations.



Dr. Rebecca Lee and several TORC Obesity Conference attendees participate in a Salsa dancing demonstration.

Dr. Lee shared some thoughts with HHP.

HHP: Will you explain the concept of social marketing in the context of your research?

Lee: Social marketing is the use of marketing techniques for some greater social good. There is a long history (pioneered by the tobacco control movement) of using social marketing in health promotion. The idea is to market healthful choices to prevent or reduce obesity in the population. This, in turn, reduces the public health burden and cost of obesity, which is projected to grow to nearly 20% of health care dollars spent within the next decade.

HHP: Do you enjoy any hobbies to relax and take a break from work?

Lee: I enjoy jogging, swimming and long walks in beautiful places. I love all kinds of dancing, particularly partner dances like Latin and ballroom. I like fine dining and wine tasting. I am an opera aficionado, and love nearly all kinds of live music. My retirement job will be a barista at a beachfront café in a Latin country.

For more on Dr. Lee's research and TORC's International Health Challenge in Second Life go to <http://hhp.uh.edu/obesity>.

ALUMNI SPOTLIGHT

Kade Lane



Kade Lane

Kade Lane graduated from UH in December of 2005, with a bachelor of science degree in kinesiology–sport administration, and a minor in mathematics. While at UH he wore the number 62 when he played football as a defensive lineman for the Cougars.

He told Coogfans.com that it was his hard work and dedication that earned him a spot on the UH team. These are the same qualities that led to a successful athletic career at UH, and now drive him as an assistant coach at Cypress Woods High School in Cypress, TX.

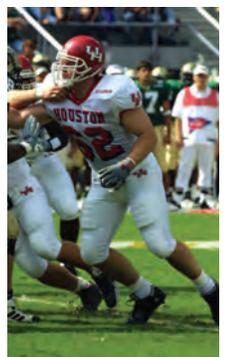
When asked what his interests were in coming to UH for the kinesiology program Lane said, "I wanted to coach at the high school level and UH's kinesiology department is a great place to achieve that goal." He specialized in sport administration in order to learn the aspects necessary to run an athletic department in a high school.

Lane began working at Cypress Woods when it opened in the fall of 2006. He is now a teacher, an assistant football coach and an assistant track and field coach. Specifically, he coaches the defensive line in football as well as the throwers on the track and field team.

When asked how he applies the knowledge gained from his studies in kinesiology and sport administration Lane replied, "I learned about different ways to coach athletes, as well as numerous health related techniques, that I use on and off the field to better train and prepare our athletes to maximize their performances."

As a noted combination of brawn and brains, Kade's coaching colleagues nicknamed him *The Professor*, acknowledging his interest in math, which he now applies as a pre-calculus teacher.

Lane plans to continue his education by obtaining a master's degree in education administration. When asked if he considered football his passion Lane replied, "I would definitely say I have a passion for football. It was a sport I loved to play. Now that my playing days are over, I still get to be around it, and share what I have learned over the years with some great kids."



Go Coogs!

We're always interested in spotlighting our alumni in the newsletter, so let us hear from you. Contact us at <http://hhp.uh.edu/alumni> and let us know what you are doing and where you're doing it!

NEW MASTERS DEGREE **Human Nutrition**

HHP is proud to announce that the Texas Coordinating Board recently approved the creation of the Master of Science in Human Nutrition degree, beginning in the fall of 2009.

Two tracks of study will be offered: nutritional science and sports nutrition. The nutritional science track will produce practitioners with the unique ability to integrate the principles of both nutrition and physiology in the development and implementation of nutritional intervention and disease prevention programs.

The emerging field of sports nutrition will use the integrated disciplines to produce sports dietitians who are being sought for positions with schools and universities, sports teams, food product development, fitness and corporate wellness, cardiac rehabilitation, community health centers, family practice clinics, and bariatric surgery practices.

Graduate students will have a variety of options for research depending on their individual interests. The HHP faculty offers a unique interdisciplinary approach to the program. Courses will include the physiology of exercise, obesity and metabolic diseases; nutrition relating to the heart and endocrine system; courses

on cancer prevention, the epidemic of obesity, and administrative courses on exercise and health.



Sharon Bode, Ph.D., R.D., clinical associate professor and director of the new program says, "The Bureau of Labor Statistics projects that employment of Registered Dietitians will grow more than 15 percent between now and 2010."

She adds that, "Corporations, schools and other facilities will have an increased emphasis on health promotion and disease prevention through dietary habits, creating opportunities for our students."

The new master's in human nutrition comes at a time when the National Health and Nutrition Examination Survey states that 60–65% of adult Americans are overweight, and approximately half of these could be classified as obese. The number of overweight children and teens has nearly doubled to 22% over the last two decades.

"The need for trained professionals to deal with the obesity epidemic in a multi-disciplinary approach continues to increase," according to Dr. Sharon Bode.

HHP WELCOMES

New Faculty



Dr. Richard J. Simpson's long-term goal in research is to understand the mechanisms that underpin age-related immune dysfunction and accelerate biological aging.

"We are considering certain disease states and conditions, such as obesity and persistent viral infections, which are known to accelerate biological aging and lead to immune dysfunction," he said.

In the short term, he is continuing to seek external funding for research and hoping to recruit quality graduate students to help advance the work.

He received his B.S. and Ph.D. from Napier University, Edinburgh, Scotland, UK.

Simpson praises the level of expertise among HHP faculty members, the enthusiastic support of the department chair, and the administration's support for creating an environment that allows faculty members to focus on the most pertinent aspects of their work, which is very important to facilitate research productivity in the department and meet the needs of our students.

He states enthusiastically that "the University of Houston will be the best institution in the country for exercise immunology research within the next few years."



Dr. William Paloski, a 23-year veteran at NASA in their neuroscience laboratory, brings a wealth of real-world experience to the department and his students. While at NASA, he researched postural stability, control, and performance before

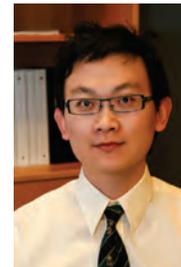
and after space flight. He also maintained laboratories at the Kennedy Space Center in Florida, the Dryden Flight Research Center in California, and the Gagarin Cosmonaut Training Center in Star City, Russia.

Paloski's research focus is improving our understanding of the way the central nervous system integrates sensory information for use in spatial orientation and movement control.

He graduated from Clarkson University, Potsdam, NY with a B.S. in mechanical engineering. Paloski earned his M.S. and Ph.D. in mechanical engineering from Rensselaer Polytechnic Institute, Troy, NY.

His experiments generally assess posture and gait performance in normal, abnormal and elite human populations using techniques drawn from the fields of systems physiology, engineering, and mathematical modeling.

Dr. Paloski's research is carried out primarily at HHP's new Center for Neuromotor and Biomechanics Research (CNBR) in the Texas Medical Center.



Dr. Jian Liu brings years of research experience from a variety of projects investigating slip and fall accidents. His future research will focus on the age-related mechanism and creating innovative solutions to prevent falls and fall-related injuries.

He earned his M.S. and Ph.D. in industrial and systems engineering from Virginia Tech, Blacksburg, VA, and will teach classes in biomechanics this summer.

At Virginia Tech, Liu was part of an engineering team that designed a pair of e-textile pants to determine elderly individual's risk of slipping and falling by sensing any variations in their walking gait.

E-TAGS, which were embedded in the pants, were attached to e-TAGS on various places of the individual. Data was then transmitted to a host computer.

The research team compared measurements from a group of elderly individuals with a medical history of falling, and a group of healthy individuals of various ages. The pants were successful in differentiating those individuals with a high risk for falling from their healthy counterparts.

Such wearable diagnostic systems will likely impact the future of health care.

Check out our exciting research projects at www.hhp.uh.edu/grants



SWEATING It Out

A new NASA-funded study, from the Department of Health and Human Performance, will examine how well sweat patches the size of adhesive strips can detect levels of chemicals that may indicate bone loss.

“Current assessments involve blood tests, urine analysis or bone density scans, all of which are time-consuming, inconvenient to the working astronauts or, in the case of bone density scans, require large equipment that’s not practical on a space station,” said Mark Clarke, associate professor and principal investigator. “These patches are small, non-intrusive, and placed on the skin to collect a sweat sample. The sample is then analyzed for biomarkers of bone loss markers, such as calcium.”

The three-year, \$780,000 study will examine three types of sweat patches, each differing in the way the sweat is collected and extracted from the devices. One device collects the sweat between the skin and a plastic layer, another is a commercially used patch that absorbs the sweat and is then reconstituted with water. The third is a Micro-fabricated Sweat Patch (MSP) built using micro-chip inspired technology. Sweat is removed from the MSP using a mini-centrifuge. The technology was developed by Clarke and Daniel Feeback, a lead scientist with NASA’s Life Sciences Directorate.

“Our goal is to develop a micro-fabricated sweat patch that collects a sweat sample from the skin, performs a biomarker analysis and immediately provides a read-out to the user,” said Clarke. The first phase of the study will determine if sweat can be used to monitor bone loss. Next, it will

determine which patch technology most accurately measures the chemicals associated with bone loss.

The last phase of the study will look specifically at the MSP and will involve 60 people, from young college students to elderly men and women, and to new Air Force recruits. Each will wear a series of patches during normal daily activities and then perform exercises at the Laboratory of Integrated Physiology. The patches will be collected and the sweat analyzed. Changes in bone also will be monitored using bone mineral density scans performed in the department.

Being in a microgravity environment causes astronauts’ bodies to lose more bone mineral than they can replace, which makes them vulnerable to fractures and breaks. Upon returning to Earth, the bone loss continues as the process of replacing the bone mineral content begins. This is a critical concern, especially as the space program considers longer space missions to Mars or the Moon.

Clarke says the research has applications for those susceptible to bone loss, such as the elderly, post-menopausal women and adolescent girls.

“Typically, it takes up to six months to see if changes in your exercise and eating habits are helping to maintain or increase bone mineral density,” Clarke said. “Astronauts on long flights need this information quicker so that they can make adjustments to their exercise protocols, diet, or drug treatments. Similarly, bone loss in women can be seen as early as the teen years, so this kind of fast and easy screening device can provide advance notice to fend off serious bone density issues later in their lives.”



Dr. Dan O'Connor holding a sweat patch