GOALS AND MISSION

Our main goal is to develop leadership in academia, government, and industry nationally and globally. The importance of global scientific, social, and cultural interaction and the demands of the dynamic, ever-changing global healthcare economy have been strongly emphasized in our undergraduate and graduate programs. The research in the graduate program focuses on three main areas, neural, cognitive, and rehabilitation engineering, biomedical imaging, and bionanoscience.

WHY UH BIOMEDICAL ENGINEERING?

- Distinguished faculty that are focused on mentoring and developing leaders in the field of BME
- Proximity to the world's largest medical center
- Opportunities for multi-institutional collaboration and research
- 95% of current full-time Doctoral students are fully funded
- Located within a dynamic city, filled with culture, history, and activities for every passion
Yun Peng, a Ph.D. student in Dr. Zhang’s Lab, spent a few days during Spring 2015 in Chicago, Illinois. He presented and attended sessions at the Innovating for Continence Conference 2015. Below is an abstract of his experience:

The Innovating for Continence Conference 2015 took place in Chicago, Illinois, USA during Apr 16-17. As an international conference, it brings together engineers, physicians, nurses, people with incontinence and their caregivers and industry representatives from all over the world and aims to educate innovators and heighten interest in innovation for continence products. I was awarded a travel grant for outstanding abstracts and presented my work on 1) the computer modeling and simulation of a novel suture method to correct urethral hypermobility and 2) the innervation zone imaging of the female pelvic floor muscles. Both of two abstracts are intimately related to the diagnosis and treatment of female stress urinary incontinence (SUI).

I benefited a lot from attending this conference. On one hand, as a biomedical engineer, I want to use my engineering skills to serve the SUI patients. It is useful to hear the voices from and exchange ideas with incontinence patients, clinical practitioners, academia and industry. It allows me to bring the ideas of our research from the engineering side to the conference and receive constructive feedbacks to sharpen my future researches. On the other hand, this conference also provides me with a great networking opportunity. I got to know several leading scientists and physicians in the SUI field.
Manmohan Singh, a Ph.D. student in Dr. Larin’s Lab, spent a few days during Fall 2014 in Medellin, Colombia. He presented and attended sessions at the FOCUS Latin American Conference. Below is an abstract of his experience:

FOCUS (Federation of Optics College and University Students) Latin America 2014 took place at EAFIT University in Medellin, Colombia. Many leading guest speakers in optics and photonics were invited to speak on their research ranging from nanophotonics to holography to fluorescence, including the founding dean of the College of Optical Sciences at the University of Arizona. There were also seminars by students from all over the world showcasing their research. I was awarded a travel grant for outstanding abstract to travel to Medellin and present my work on three dimensional elasticity mapping of the cornea before and after UV-induced collagen cross linking.

We are developing a method for assessing the elasticity of soft tissues in order to detect various diseases which alter the biomechanical properties of tissues. One such example is the cornea. Degenerative diseases such as keratoconus weaken the cornea and drastically reduce the quality of vision. UV-induced collagen cross linking is an emerging treatment to strengthen the cornea, however, it is a blanket treatment and is not custom tailored to individual cases. By assessing the biomechanical properties of the cornea before and after treatment, we may be able to increase the efficacy of the treatment and prevent the need for multiple treatments.

SUMMER 2014

Nate Piety, a Ph.D. student in Dr. Shevkoplyas’ lab, spent his summer in Finland under the Whitaker International Program Summer Grant. Below is the abstract of his project.

We at the Blood Microfluidics Laboratory of Dr. Sergey Shevkoplyas (UH BME) have previously developed a paper-based assay capable of diagnosing sickle cell disease (SCD) in a laboratory setting utilizing the pattern of
the stain produced by a blood sample on paper, but the effects of humidity on the process of bloodstain
formation in porous media such as paper are not well understood. Here, in collaboration with the laboratory of
Prof. Jouko Peltonen, Center for Functional Materials (FUNMAT), Åbo Akademi University, Turku, Finland, we
investigated the effects of relative humidity on blood stain formation and developed an integrated paper-based
humidity sensor. The results of this project will enable us to significantly improve reliability of the assay in field
settings and ultimately enable successful deployment of our SCD test to health clinics in sub-Saharan Africa.

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