

The Department of Mechanical Engineering  
PRESENTS

**Christopher J. Hernandez,  
Ph.D.**

Associate Professor

Sibley School of Mechanical and Aerospace Engineering  
Department of Biomedical Engineering  
Cornell University  
Adjunct Assistant Scientist, Hospital for Special Surgery



**Friday, May 29, 2015  
WCH Room 205/206  
11:10-12:00PM**

**Biomechanics and Mechanobiology: From  
Bones to Bacteria**

***Abstract:***

Biomechanics is the study of the mechanical performance of organisms and the cells and tissues from which they are made. Mechanobiology is the interaction between mechanical stress and strain and biological processes. The primary goal of my laboratory is to understand failure processes in bone. I will discuss recent work in my laboratory examining the propagation of microscopic damage in trabecular bone, which provides the first ever study of microdamage propagation within the struts of a cellular solid. In addition to my work in bone, I will introduce recent work in my laboratory applying the concepts of biomechanics and mechanobiology to bacteria. Cell mechanics and mechanobiology have to date concentrated on mechanical performance of eukaryotic cells, primarily mammalian cells, yet prokaryotic organisms make up a great majority of forms of life on Earth. I will describe our results using a nano-fluidic experimental mechanics platform for determining the mechanical properties of live bacteria and how mechanical forces influence bacterial physiology.

***About the Speaker:***

Dr. Hernandez is an Associate Professor in the Sibley School of Mechanical and Aerospace Engineering and the Department of Biomedical Engineering at Cornell University. Additionally he is an Adjunct Assistant Scientist at the Hospital for Special Surgery. Hernandez earned a S.B. in Engineering Sciences from Harvard University (1996). He went on to earn M.S. and Ph.D. degrees in Mechanical Engineering at Stanford University (1997, 2001). Dr. Hernandez was awarded the Harold M. Frost Young Investigator Award by the American Society for Bone and Mineral Research in 2006 and has twice been a finalist for the New Investigator Recognition Award by the Orthopaedic Research Society (2004, 2006).