

The Department of Biomedical Engineering  
*Presents:*

**Multi-scale disc mechanics: Implication for function, degeneration, and treatment**

*By*

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**ABSTRACT:**

Intervertebral disc degeneration is a progressive disorder where the structure, composition and mechanical function of the disc deteriorates, often leading to chronic low back pain. Our goal is to quantify disc structure-function relationships at multiple scales in order to determine the mechanisms at play in the degenerative process and to develop and evaluate therapies. At the structural level, we quantify internal strain fields within the intact disc by analyzing magnetic resonance images obtained while loading the spine segment. At the tissue level, we quantify disc tissue structure-function relationships by modeling the anisotropic and nonlinear material behaviors with a fiber-reinforced constitutive model. We have applied these concepts to tissue engineering the disc, where we use native fiber structure and mechanics to guide our engineered construct design and evaluation.

**3:35 – 4:30 P.M.**  
**Monday, September 14, 2009**  
**Room 2-101 NHH**  
BME 8601 Graduate Seminar

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