

# Engineering Neuroscience & Health

Department of Biomedical Engineering

Division of Biokinesiology and Physical Therapy



## SEMINAR SERIES



**Presents:**

**Dr. Richard L. Lieber**

University of California, San Diego

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**Monday**

**January 12, 2009**

**4:00 p.m.**

**Refreshments will be served 3–4 p.m.**

### **Biological and Biomechanical Basis of Skeletal Muscle Injury**

**Richard L. Lieber**

*Departments of Orthopaedic Surgery and Bioengineering*

Forced lengthening of skeletal muscles (*i.e.*, “eccentric contractions”) produce injury and, ultimately, muscle strengthening. Such contractions are common in everyday movements as well as sports activities. Because they are mechanically unique and have dramatic biological consequences, it is becoming increasingly popular to study the mechanics and biology of eccentric contraction-induced muscle injury. Current data suggests that the earliest events associated with injury are mechanical in nature and are based primarily on sarcomere strain. Such strain results in relatively rapid breakdown or reorganization of cytoskeletal elements within the muscle cell can causes waves of muscle-specific gene expression. We have developed animal models of muscle injury that mimic the effects seen in humans. In addition, the use of muscles with “knocked out” or modified cytoskeletal proteins give insights into load bearing and transmission in skeletal muscle. Ultimately, an improved understanding of the damage mechanism may improve our ability to provide rehabilitative and strengthening prescriptions that have a rational scientific basis.

#### **BIOSKETCH**

**Professor:** Department of Orthopaedic Surgery and Bioengineering

**Education:** March 1983, Ph.D (Biophysics, Electrical Engineering minor)

Department of Zoology , University of California, Davis

June 1978, B.S. Animal Physiology

University of California, Davis

#### **Locations:**

*Seminar is simultaneously presented*

**HSC: CHP 147 - LIVE**

**Center for the Health Professional**

HSC Campus Map/Directions:

<http://www.usc.edu/about/visit/hsc/>

**UPC: HNB 100 – Video Conference**

**Hedco Neurosciences Building**

UPC Campus Map/Directions:

<http://www.usc.edu/about/visit/upc/>

#### **Web Cast**

<http://capture.usc.edu/college/Catalog/?cid=af180d48-ceff-42b9-a35c-eb199daed320>

**Information about all seminars can be found at**

<http://www-clmc.usc.edu/~heiko/ENH>