

# Lab 1: Tissue biomechanics and mechanobiology

**PI:** Alan Grodzinsky

**Lab Instructors:** Eliot Frank, Diana Chai

## Summary

- Mechanical testing of cartilage under static and dynamic compression and shear. We will demonstrate the use of plugs of bovine tissue run through a series of tests in the apparatus.
- Demonstrations of incubator-housed bioreactors for application of dynamic compression and shear to cartilage specimens, and the various cell- and molecular-biological outcome measures that are used to assess mechanotransduction mechanisms in cells in their native dense extracellular matrix environment.

## Recommended Reading

J. Kisiday, A. Kerin and A. Grodzinsky, "Mechanical Testing of Cell-Material Constructs," from *Methods in Molecular Biology*, ed. A. P. Hollander and P. V. Hatton, Humana Press, 2004.

C. Wheeler, *et al.*, "Cartilage mechanobiology: the response of chondrocytes to mechanical force," *Cur. Opin. Orthop.* **16**.

<http://www.openwetware.org/wiki/GEM4labs>

