

FACULTY & STAFF

Primary Faculty

Associated Faculty

Administrative Staff

Directories

- Primary Faculty
- Associated Faculty
- Research Associates
- Research Staff
- Administrative Staff
- Locations & Addresses

BME Procedures

BME Links

SEARCH BME :

SEARCH

Steven Eppell, Ph.D.

Associate Professor

Office:	Room 203 Wickenden Building
Phone:	(216)-368-4067
Fax:	(216)-368-4969
Email:	sje@case.edu
Mail Address:	Room 309 Wickenden Building 10900 Euclid Avenue Cleveland, OH 44106-7207



Selected links:

- [Department of Biomedical Engineering](#)
- [PubMed Citations >>](#)

Research Summary

The focus of research in my laboratory is on orthopedic biomaterials. Fixation of implants (a biochemical phenomenon) and stress shielding (a biomechanical phenomenon) are two of the major clinical problems associated with currently available biomaterials. We are interested in taking a first principles approach to understanding molecular interactions leading to biochemical and biomechanical function of cartilage and bone. Our emphasis is on analysis of these tissues at the sub-molecular level which is accomplished by the development and use of nanoscale instrumentation. Currently we are applying these techniques to the study of collagens and the fundamental mineral units found in bone. The results of these experiments will guide us away from the use of homogenous materials (like the clinically popular Ti and Co based alloys) and toward more sophisticated hierarchical composites.

Recent Publications

- Katz JL, Misra A, Spencer P, Wang Y, Bumererraj S, Nomura T, Eppell SJ, Tabib-Azar M, Multiscale mechanics of hierarchical structure/property relationships in calcified tissues and tissue/material interfaces, *Materials Science and Engineering*, In Press .
- Liu Z, Smith BN, Kahn H, Ballarini R, Eppell SJ. Mechanical Testing of Hydrated Collagen Nanofibrils Using MEMS Technology, *Sixth IEEE Conference on Nanotechnology*, 17-20 July 2006, Cincinnati, Ohio, USA. IEEE catalog number 06TH8861C, ISBN 1-4244-0078-3, library of congress 2005937117, 2006.
- Eppell SJ, Smith BN, Kahn H, Ballarini R, Nano Measurements With Micro Devices: mechanical properties of hydrated collagen fibrils, *Journal of the Royal Society Interface*, 3, No. 6, pp. 117-121 (2006).
- DiLisi GA, Eppell SJ and Upton J, Hierarchical Learning Ensembles: Team-Building for Undergraduate Scientists and Engineers, *J. of College Science Teaching*, XXXV, No. 5, pp.21-25 (2006).
- Vasanji A, Ghosh PK, Graham LM, Eppell SJ, Fox PL, Polarization of plasma membrane microviscosity during endothelial cell migration, *Dev Cell*. 6, No. 1, pp. 29-41 (2004).
- Todd BA and Eppell SJ, Probing the Limits of the Derjaguin Approximation with Scanning Force Microscopy, *Langmuir*, 20, No. 12, pp. 4892-4897 (2004).

This page was last modified November 18, 2009