

# Blake W. Erickson

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## Research Interests

Dynamic behavior of biological membranes  
Ultra high resolution imaging of sub-cellular mechanical processes  
Cellular transport mechanisms and modeling

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## Education

**Ph.D., Biophysics – The University of Michigan, Ann Arbor**  
○ May 2010; Advisors – Mark M. Banaszak Holl & Bradford Orr  
○ Title: Functional Imaging and Mechanics of Nanoscale Biological Systems  
**Bachelors of Science, Creative Studies (Physics) – The University of California, Santa Barbara**  
○ June 2006; Advisor – Paul K. Hansma  
**Bachelors of Arts, Creative Studies (Literature) – The University of California, Santa Barbara**  
○ June 2006

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## Research Experience

**The University of Michigan, Ann Arbor: Banaszak Holl Research Group (January 2007 – Present)**  
○ Atomic Force Microscopy investigations of polymer interaction with model membrane systems  
○ Investigations of behavior of nanoscopic domains  
○ Functional imaging and quantification of the collagen ultrastructure in bone with Atomic Force Microscopy  
**The University of California, Santa Barbara: Paul Hansma Research Group (April 2004- June 2006)**  
○ Design, fabrication and implementation of mechanical testing devices and control systems  
○ Simultaneous mechanical testing and functional imaging of trabecular bone

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## Awards and Fellowships

**Physics Research Honors**  
○ University of California, Santa Barbara : May 2004  
**College of Creative Studies, Summer Undergraduate Research Fellowship**  
○ University of California, Santa Barbara: June-August 2005  
**Physics Research Honors,**  
○ University of California, Santa Barbara: May 2005  
**Physics Research Honors**  
○ University of California, Santa Barbara: May 2006  
**Physics Academic Honors**  
○ University of California, Santa Barbara: May 2006  
**Arnold Nordsieck Award** for outstanding research promise,  
○ University of California, Santa Barbara : May 2006  
**Molecular Biophysics Training Grant**  
○ University of Michigan, Ann Arbor: Sept 2006-August 2008

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## Professional Memberships

**American Chemical Society (ACS) – Student Member**  
**Biophysical Society – Student Member**

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## Coursework

**Physics:** Classical Mechanics, Electricity and Magnetism, Thermodynamics, Statistical Mechanics, Quantum Mechanics, Analytical/Mathematical Methods, Optics, Computer Interfacing, Analog/Digital electronics, Instrumentation Design and Fabrication

**Biology and Bioengineering:** Cell Biology, Biophysical Methods, Biophysical Fundamentals, Biomedical Optics

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## Teaching and Mentorship

### Graduate Instruction – The University of Michigan, Ann Arbor

- **General Chemistry Lab Lead** (September 2009-Present)
  - Currently instructing two sections of 22 students each
  - Assisting in the administration of a class of 1450 students
  - Mentoring and guiding 30 fellow instructors, many of who are new to the course.
- **General Chemistry Lab** (September 2008 – May 2009)
  - Learned to adapt teaching and leadership styles to ensure success of the students (30 – 50 students)

### Graduate Research Mentorship – The University of Michigan, Ann Arbor

- Graduate Student (January 2008 – May 2008)
  - Undergraduate Students (June 2007 – August 2007, June 2008 – August 2008)
  - Guided multiple students through experimental design, data collection, and analysis to ensure project goals were met
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## Publications

- Thurner, P. J.; **Erickson, B.**; Schriock, Z.; Langan, J.; Scott, J.; Zhao, M.; Fantner, G. E.; Turner, P.; Kindt, J. H.; Schitter, G.; Hansma, P. K., High-speed photography of human trabecular bone during compression. *Mater. Res. Soc. Symp. Proc.* 2005, 874, (Structure and Mechanical Behavior of Biological Materials), 97-102.
  - Thurner, P. J.; **Erickson, B.**; Schriock, Z.; Langan, J.; Scott, J.; Zhao, M.; Weaver, J. C.; Fantner, G. E.; Turner, P.; Kindt, J. H.; Schitter, G.; Morse, D. E.; Hansma, P. K., High-speed photography of the development of microdamage in trabecular bone during compression. *J. Mater. Res.* 2006, 21, (5), 1093-1100.
  - Thurner, P. J.; **Erickson, B.**; Jungmann, R.; Schriock, Z.; Weaver, J. C.; Fantner, G. E.; Schitter, G.; Morse, D. E.; Hansma, P. K., High-speed photography of compressed human trabecular bone correlates whitening to microscopic damage. *Engineering Fracture Mechanics* 2007, 74, (12), 1928-1941.
  - **Erickson, B.**; DiMaggio, S. C.; Mullen, D. G.; Kelly, C. V.; Leroueil, P. R.; Berry, S. A.; Baker, J. R.; Orr, B. G.; Holl, M. M. B., Interactions of poly(amidoamine) dendrimers with Survanta lung surfactant: The importance of lipid domains. *Langmuir* 2008, 24, (19), 11003-11008.
  - Thurner, P. J.; **Erickson, B.**; Turner, P.; Jungmann, R.; Lelujian, J.; Proctor, A.; Weaver, J. C.; Schitter, G.; Morse, D. E.; Hansma, P. K., The effect of NaF in vitro on the mechanical and material properties of trabecular and cortical bone. *Adv. Mater. (Weinheim, Ger.)* 2009, 21, (4), 451-457.
  - Mukherjee, J.; **Erickson B.**; Maldonado, S., Physicochemical and Electrochemical Properties of Chemically Etched GaP (111)A and (111)B. *In Preparation* 2009
  - **Erickson, B.**; Wallace, J. M.; Orr, B. G.; Holl, M. M. B., Quantifying Structural Differences in Type I Collagen Fibrils Between Diseased and Healthy Bone in situ using Atomic Force Microscopy. *In Preparation* 2009.
  - Wallace, J. M.; **Erickson, B.**; Les, C. M.; Orr, B. G.; Holl, M. M. B., Distribution of Type I Collagen Morphologies in Bone: Relation to Osteoporosis. *Bone*, Submitted 2009.
  - Wallace, J. M.; Fang, M.; **Erickson, B.**; Marini, J. C.; Banaszak Holl, M. M., Ultrastructural Changes in Type I Collagen in the Brl1 IV Mouse Model of Osteogenesis Imperfecta. *In Preparation* 2009.
  - Wallace, J. M.; Chen, Q.; Fang, M.; **Erickson, B.**; Orr, B. G.; Banaszak Holl, M. M.,
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Lack of Tissue-Specific Differences in the Distribution of Type I Collagen Fibril Morphologies. *Nano Letters* Submitted 2009.

- **Erickson, B.;** Triplett, L. D.; Orr, B. G.; Holl, M. M. B.; Sinniah, K., Preventing Damage to Biological Samples, while Increasing the Accuracy of Force Spectroscopy Measurements. *Review of Scientific Instruments*, Submitted 2009
  - **Erickson, B.;** Sinniah, K., Comparison of Automated Analysis Methods and Associated Errors in Force Spectroscopy. *In Preparation* 2009.
  - **Erickson, B.;** Duthie, K.; DiMaggio, S. C.; Mullen, D. G.; Kelly, C. V.; Orr, B. G.; Holl, M. M. B., Coexisting Nanoscopic Lipid Domains. *In Preparation* 2009.
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