Michael C. Mancini

SCIENTIFIC INTERESTS

- **Cardiovascular biology:** better treatment of heart disease through a more thorough, quantitative understanding of the cardiovascular system at the vascular level; earlier detection and treatment of vulnerable plaques to increase quality of life
- **Nano-scale engineering:** self-assembled, nano-scale structures as novel therapeutic and diagnostic tools
- **Nanotoxicology:** understanding the *in vivo* fate of nanoparticles, especially semiconductor quantum dots

EDUCATION

Georgia Institute of Technology and Emory University, Atlanta, GA; Graduate Student 2005-Current
Third-year student in the Wallace H. Coulter Department of Biomedical Engineering. Overall GPA of 3.35. Expected graduation in 2010.

University Of Rochester, Rochester, NY; B.S. in Biomedical Engineering 2001-2005
Graduated from ABET-accredited program, concentration in cell & tissue engineering. Overall GPA of 3.55, graduated with distinction. Dean's list, 6 of 8 semesters.

RESEARCH AND TECHNICAL EXPERIENCE

Graduate research at Georgia Tech and Emory University, Nie Research Group 2006-Current
Graduate student under Shuming Nie. Investigating the biological fate of quantum dots *in vivo*. Determined hypochorous acid as a causative agent of quantum dot fluorescence quenching and physical degradation, and currently determining the precise mechanism of hypochorous acid-mediated fluorescence quenching in quantum dots. Currently investigating the fate of quantum dots in the *in vivo* milieu.

Graduate rotation project at Georgia Tech, L.V. McIntire and S.G. Eskin 2005
Semester-long graduate rotation with Larry McIntire and Suzanne Eskin. Verified promoter region plasmid constructs of oxidative stress-sensitive genes linked to GFP and luciferase reporters. Used restriction enzyme digests resolved on agarose gel electrophoresis to map constructs.

Undergraduate research at University of Rochester, M.R. King and K. Fujiwara 2004-2005
Internship and independent study in a collaborative project between Michael King and Keigi Fujiwara. Developed lab protocols for microcontact printing of extracellular matrix proteins and antibodies; investigated endothelial cell signaling response to hyperosmotic shock and fluid shear stress on micropatterned surfaces. Co-developed (with Ken-ichi Kusano) PECAM-1 fusion proteins in a mammalian expression system for use in the microcontact printing project and other research projects.

Senior design project Personally Adjustable Hearing Loss Simulator
Lead software programmer in a senior design project group (PAHLS) to create a device to accurately simulate individualized hearing loss, to be used in counseling and for education. Team awarded first place in Forbes Engineering Entrepreneurship Competition at the University of Rochester, and first place by biomedical engineering faculty for best final presentation.

AWARDS

Cell and Tissue Engineering Training Grant, T32 GM08433 2006-2008
Competitive NIH-funded training grant in cell and tissue engineering for Ph.D students.

First Place, Forbes Engineering Entrepreneurship Competition, University of Rochester May 2005
Competitive business plan competition for engineering senior design projects. Team awarded first place for business plan to commercialize the PAHLS device, a hearing loss simulator.

TEACHING EXPERIENCE

Lead TA: Systems Physiology I at Georgia Institute of Technology Fall 2007-Spring 2008
Class in undergraduate (sophomore-junior) cell biology for biomedical engineering majors, instructors Barbara Boyan and Thomas Barker. In charge of laboratory organization, policies, and grading. Responsible for coordinating individual lab TAs and addressing all student concerns. Advocated for and introduced a 'lab math' course to improve undergraduate performance at math used in lab, and introduced the 'lab cash' system, a token-based reward system, to improve student participation in class. Taught a four course section on the cell cytoskeleton, cell-cell interactions, and cell migration in the context of angiogenesis.

Lead TA in Training: Systems Physiology I at Georgia Institute of Technology Spring 2007
Class in undergraduate (sophomore-junior) cell biology for biomedical engineering majors, instructors Barbara Boyan and Donald Ranly. Participated in an experimental study to introduce PBL-style methods into a teaching laboratory as co-instructor with Esfandiar Behravesh, director of instructional laboratories.

Laboratory TA: Systems Physiology I at Georgia Institute of Technology Fall 2006
Class in undergraduate (sophomore-junior) cell biology for biomedical engineering majors, instructors Barbara Boyan and Donald Ranly. In charge of one laboratory section. Responsible for teaching students in lab and assessing progress.

PUBLICATIONS

Mancini M.C.; Kairdolf B.A.; Smith A.M.; and Nie S. Fluorescence quenching, fluorescence restoration, and degradation of semiconductor quantum dots by hypochlorous acid. *In preparation*. **2008**.

Kairdolf B.A.; **Mancini M.C.**; Smith A.M.; and Nie S. Minimizing nonspecific cellular binding of quantum dots with hydroxyl-derivatized surface coatings. *Anal. Chem.* 80(8), 3029-3034, **2008**.

PRESENTATIONS

Presenter at the Annual Fall Meeting of the Biomedical Engineering Society 2007
Mancini, M.C. and Nie, S. *Cardiovascular Nanotechnology: Development of Nanoparticle Agents for Probing Oxidative Stress*. Annual Fall Meeting of the Biomedical Engineering Society, Los Angeles, CA, Sept. 26-29, 2007.

Platform presentation at the Annual Fall Meeting of the Biomedical Engineering Society 2007
Behravesh E., Fasse B.B., **Mancini, M.C.**, Newstetter W.C., and Boyan, B.D. *A Comparative Study of Traditional and Problem-Based Learning Instructional Methods in a Lab Setting.* Annual Fall Meeting of the Biomedical Engineering Society, Los Angeles, CA, Sept. 26-29, 2007.

PHOTOGRAPHY

Cover picture on *Principles of Cellular Engineering: Understanding the Biomolecular Interface* **2006**
Cover image of endothelial cells treated to steady shear stress on a micropattern of fibronectin, labeled on 3 fluorescence channels (nuclear stain, vinculin, and F-actin). Appears on *Principles of Cellular Engineering: Understanding the Biomolecular Interface*, 1st Ed.; King, M.R., Ed.; Academic Press, 2006.

Cover picture on *Heat Transfer and Fluid Flow in Minichannels and Microchannels* **2005**
Cover image of endothelial cells cultured on a micropattern of fibronectin and fibrinogen, labeled on 2 fluorescence channels (fibrinogen and F-actin). Appears on *Heat Transfer and Fluid Flow in Minichannels and Microchannels*, 1st Ed.; Kandlikar S., Garimella S., Li D., Colin S., and King M.R., Eds.; Elsevier, 2005.