

Eric E. Nuxoll

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Education

Doctor of Philosophy, University of Minnesota, June 2003

Major Program: Chemical Engineering

Dissertation: “Transient Transport in Reactive Barrier Membranes”

Advisor: Edward L. Cussler, Jr.

Bachelor of Engineering (*summa cum laude*), University of Idaho, May 1998

Major Program: Chemical Engineering Minor Program: Mathematics

Bachelor of Science (*summa cum laude*), University of Idaho, May 1998

Major Program: Chemistry, Professional Minor Program: French

Professional Experience

2008, Fall—Present

Assistant Professor, University of Iowa Department of Chemical & Biochemical Engineering

Assistant Professor, University of Iowa Division of Pharmaceutics & Translational
Therapeutics (secondary)

2004, Summer—2008, Summer

Postdoctoral Fellow, University of Minnesota Department of Pharmaceutics

Project: “Development of BioMEMS Pulsatile Hormone Delivery System”

Sponsor: Ronald A. Siegel

2003, Summer—2004, Summer

Postdoctoral Researcher, Univ. of Minnesota Dept. of Chem. Engineering & Materials Science

Project: “Impermeable Flake Incorporation in Flexible Barrier Membranes”

Sponsor: Edward L. Cussler, Jr.

Honors & Awards

Excellence in Teaching and Dedication to Student Success (selected by graduating class) Fall 2013

UI Old Gold Summer Fellow, 2010.

NIH Kirschstein National Research Service Award Post-Doctoral Fellowship, 2006-2008.

PhARMA Foundation Post-Doctoral Fellowship Award (declined), 2006.

NSF Graduate Research Fellow, 1998-2001.

Lindley Award (top student in College of Letters & Science), University of Idaho, 1998.

Outstanding Senior (elected by peers), University of Idaho Chemical Engineering Dept., 1998.

Phi Beta Kappa (L & S honorary), inducted 1996.

Tau Beta Pi (Engineering honorary), inducted 1996.

Courses Taught

- CBE:3115. Mass Transfer & Separations (Fall '09, '10, '11, '12, '13, '14, '15)
CBE:5000. Seminar in Chemical & Biochemical Engineering
(Fall '10, '11, '12, '13, '14, '15, Spring '11, '12, '13, '14, '15)
CBE:5104. Introduction to Literature Review & Technical Writing (Spring '11, '12, '13, '14, '15)
CBE:5105. Introduction to Literature Review & Proposal Writing
(Spring '09, '10, '11, '12, '13, '14, '15)
CBE:5210. Bioseparations (Fall '08, Spring '10, '12, '14, '16)
ENGR:2130. Fundamentals of Engineering III: Thermodynamics (Fall '10, '12, '15)
GRAD:7270. Principles of Scholarly Integrity (Fall '09, '10, '11, '12, '13, Spring '10, '11, '12, '13)

Current Synergistic Activities

- UI Chemical & Biochemical Engineering Graduate Admissions Director, 2012—present
(Graduate Admissions Committee, 2010—present)
UI Chemical & Biochemical Engineering Graduate Pre-Thesis Committee, 2011—present
UI College of Engineering Grand Challenges Scholars Committee, 2011—present
(Grand Challenges Scholars Program Creation Committee Chairman, 2011)
UI College of Engineering Recruitment/Orientation Presenter, 2009—present
UI College of Engineering Graduate Ethics ENGR:7270 Lecturer, 2012—present
(UI Principles of Scholarly Integrity GRAD:7270 Developer, 2009)
UI College of Engineering Technology Committee, 2014—present
UI Center for Biocatalysis and Bioprocessing Executive Committee, 2010—present
UI NSF Nanoscience & Nanotechnology REU Mentor, 2011—present
AIChE Annual Meeting Session Chair, “Nanofabrication & Nanoscale Processing” 2011—present

Referee for Funding Agencies

- National Science Foundation, CBET division, 2011—present
JDRF (formerly Juvenile Diabetes Research Foundation), 2014—present
American Chemical Society Petroleum Research Fund, 2012

Referee for Journals

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| ACS Applied Materials & Interfaces | Journal of Chemical Technology & Biotechnol. |
| AIChE Journal | Journal of Membrane Science |
| Biochemical Engineering Journal | Journal of Physical Chemistry B |
| Chemical Engineering Science | Langmuir |
| Colloids and Surfaces B | Microelectronic Engineering |
| Engineering in Medicine & Biology Magazine | Micromachines |
| IEEE Transactions on Biomedical Engineering | Soft Matter |
| Industrial and Engineering Chemistry Research | Therapeutic Delivery |
| International Journal of Molecular Sciences | |

Publications

- (23) Ricker, E.B., T.M. Bader, B. Hundley, and E. Nuxoll, "Evaluation of Thermal Shock Susceptibility of *Pseudomonas aeruginosa* Biofilms." *Biotechnology & Bioengineering*, Submitted.
- (22) Coffel, J. and E. Nuxoll, "Unified Polymer Erosion Model for Pulsatile Drug Delivery." *Journal of Membrane Science*, Submitted.
- (21) Coffel, J. and E. Nuxoll, "Poly(vinyl alcohol) Tissue Phantoms as a Robust in vitro Model for Heat Transfer." *International Journal of Polymeric Materials and Polymeric Biomaterials*, Submitted.
- (20) Worthington, K.S., L.A. Wiley, R.F. Mullins, B.A. Tucker, and E. Nuxoll, "Pre-vascularized silicon membranes for the enhancement of transport to implanted medical devices." *Journal of Biomedical Materials Research, Part B: Applied Biomaterials*, In Press; available online. DOI: 10.1002/jbm.b.33502
- (19) Nishii, Y., Gandhi, S., and E. Nuxoll, "Glucose-Powered Pulsatile Release." *Chemical Engineering Research & Design*, 2016. 106: p.298-307.
- (18) Gandhi, S. and E. Nuxoll, "Non-delaminating Pulsatile Release Composites." *Chemical Engineering Science*, 2016. 141: p.133-142.
- (17) Gandhi, S., M.D. Gosse, Y. Nishii, and E. Nuxoll, "Barrier-Mediated Pulsatile Release." *Journal of Membrane Science*, 2015. 495: p.351-360.
- (16) Coffel, J. and E. Nuxoll, "Magnetic Nanoparticle / Polymer Composites for Medical Implant Infection Control." *Journal of Materials Chemistry B.*, 2015. 3: p.7538-7545.
- (15) O'Toole, A., E.B. Ricker, and E. Nuxoll, "Thermal Deactivation of *Pseudomonas aeruginosa* Biofilms." *Biofouling*, 2015. 31(8): p. 665-675.
- (14) Nuxoll, E., "Added Release Time in Diffusion/Dissolution Coupled Release." *International Journal of Pharmaceutics*, 2015. 494: p. 195-204.
- (13) Nuxoll, E., "BioMEMS in drug delivery." *Advanced Drug Delivery Reviews*, 2013. 65(11-12): p. 1611-1625.
- (12) Siegel, R.A., Y. Gu, M. Li, A. Baldi, E.E. Nuxoll, and B. Ziaie, "Hard and Soft Micro- and Nanofabrication: an Integrated Approach to Hydrogel Based Biosensing and Drug Delivery." *Journal of Controlled Release*, 2010. 141: p. 303-313.
- (11) Nuxoll, E.E., M.A. Hillmyer, R. Wang, C. Leighton, and R.A. Siegel, "Composite Block Polymer-Microfabricated Silicon Nanoporous Membrane." *ACS Applied Materials & Interfaces*, 2009. 1(4): p. 888-893.
- (10) Lei, M., A. Baldi, E. Nuxoll, R.A. Siegel, and B. Ziaie, "Hydrogel-based sensors for wireless chemical monitoring." *Biomedical Microdevices*, 2009. 11: p. 529-538.

- (9) Nuxoll, E.E. and R.A. Siegel, "BioMEMS Devices for Drug Delivery." *IEEE Engineering in Medicine and Biology Magazine*, 2009. 28(1): p. 31-39.
- (8) Lei, M., B. Ziaie, E. Nuxoll, K. Iván, Z. Noszticzius, and R. Siegel, "Integration of Hydrogels With Hard and Soft Microstructures." *Journal of Nanoscience and Nanotechnology*, 2007. 7: p. 780-789.
- (7) Lei, M., A. Baldi, E. Nuxoll, R.A. Siegel, and B. Ziaie, "A Hydrogel-Based Implantable Micromachined Transponder for Wireless Glucose Measurement." *Diabetes Technology and Therapeutics*, 2006. 8(1): p. 112-121.
- (6) Nuxoll, E.E., R.A. Siegel, and E.L. Cussler, "Layered reactive barrier films." *Journal of Membrane Science*, 2005. 252(1-2): p. 29-36.
- (5) Nuxoll, E.E. and E.L. Cussler, "The third parameter in reactive barrier films." *AIChE Journal*, 2005. 51(2): p. 456-463.
- (4) DeRocher, J.P., B.T. Gettelfinger, J. Wang, E.E. Nuxoll and E.L. Cussler, "Barrier Membranes with Different Sizes of Aligned Flakes" *Journal of Membrane Science*, 2005. 254(1): p. 21-30.
- (3) Shimotori, T., E.E. Nuxoll, E.L. Cussler, and W.A. Arnold, "A Polymer Membrane Containing Fe₀ as a Contaminant Barrier." *Environmental Science & Technology*, 2004. 38: p. 2264-2270.
- (2) Lape, N.K., E.E. Nuxoll and E.L. Cussler, "Polydisperse Flakes in Barrier Films." *Journal of Membrane Science*, 2004. 236(1): p. 29-37.
- (1) Yang, C., E.E. Nuxoll, and E.L. Cussler, "Reactive barrier films." *AIChE Journal*, 2001. 47(2): p. 295-302.

Invited Presentations

- (14) "Magnetic Nanoparticle / Polymer Composites for Medical Implant Infection Control." University of Iowa—Nanoscience and Nanotechnology Institute REU Symposium Series, July, 2015.
- (13) "Barrier-Mediated Pulsatile Release." Illinois Institute of Technology, February, 2014.
- (12) "Pulsatile Release from Polymer Laminates." University of Idaho, October, 2013.
- (11) "Barrier-Mediated Pulsatile Release." Washington State University, October, 2013.
- (10) "Magnetic Nanoparticles for Wireless Biofilm Mitigation." University of Iowa—Nanoscience and Nanotechnology Institute REU Symposium Series, July, 2013.
- (9) "Membranes for Manipulating Motions of Medical Molecules." Cornell College, April, 2013.
- (8) "Cooking Bacteria with Magnets." University of Iowa—College of Engineering President's Luncheon, March, 2013.

- (7) “Mitigation of Bacterial Infections via Magnetic Hypertherapy.” Iowa State University, February, 2013.
- (6) “Magnetic Nanoparticles for Wireless Biofilm Mitigation.” University of Iowa—Nanoscience and Nanotechnology Institute REU Symposium Series, June, 2012.
- (5) “Membranes as Medical Machines.” University of Iowa—Mechanical and Industrial Engineering Departmental Seminar Series, March, 2012.
- (4) “Remote Sterilization of Medical Implants via Magnetic Nanoparticles.” University of Iowa—Nanoscience and Nanotechnology Institute REU Symposium Series, June, 2011.
- (3) “Membranes for Manipulating Motions of Medical Molecules.” University of Iowa—Biomedical Engineering Departmental Seminar Series, February, 2011.
- (2) “Membranes for Manipulating Motions of Medical Molecules.” University of Northern Iowa—Physics Colloquium, October, 2010.
- (1) “Controlled Surface and Pore Structure in Asymmetric Membranes for Implantation.” University of Minnesota—*IPrime* Workshop. January, 2008.

Presentations at National / International Meetings (speaker or senior author only)

- (21) Joel Coffel and Eric Nuxoll, “Poly(vinyl alcohol) Tissue Phantoms for Robust Modeling of in Vitro Thermal Transport” *AICHE Annual Meeting*, Salt Lake City, UT, Nov.8-13, 2015.
- (20) Joel Coffel and Eric Nuxoll, “Wireless, Thermal Deactivation of Medical Device Infections Using an Iron Oxide Nanoparticle / Polymer Coating” *AICHE Annual Meeting*, Salt Lake City, UT, Nov.8-13, 2015.
- (19) Erica Ricker, Ann O'Toole, Bryce Hundley and Eric Nuxoll, "Biofilm Mitigation on Implanted Devices" *AICHE Annual Meeting*, Salt Lake City, UT, Nov.8-13, 2015.
- (18) Joel Coffel and Eric Nuxoll, "Computational and Experimental Modeling of Hyperthermia in Physiological Systems" *AICHE Annual Meeting*, Atlanta, GA, Nov.16-21, 2014.
- (17) Joel Coffel and Eric Nuxoll, "Controlled, Wireless Heating of Iron Oxide Nanoparticle Composites" *AICHE Annual Meeting*, Atlanta, GA, Nov.16-21, 2014.
- (16) Swapnil Gandhi and Eric Nuxoll, “Pulsatile Release of Model Drugs Through Layered Polymers” *AICHE Annual Meeting*, San Francisco, CA, Nov.3-8, 2013.
- (15) Swapnil Gandhi and Eric Nuxoll, “Multi-membrane Systems for Controlled Release” *AICHE Annual Meeting*, San Francisco, CA, Nov.3-8, 2013.
- (14) Ann O'Toole and Eric Nuxoll, “Biofilm Mitigation Via Magnetic Hyperthermia” *AICHE Annual Meeting*, San Francisco, CA, Nov.3-8, 2013.

- (13) Joel Coffel and Eric Nuxoll, "Thermal Modeling of Wirelessly Heated Tissue Mimics" *AICHE Annual Meeting*, San Francisco, CA, Nov.3-8, 2013.
- (12) Ann O'Toole and Eric Nuxoll, "Confocal Fluorescent Microscopy vs. Direct Enumeration for Quantification of Biofilm Infection Deactivation" *AICHE Annual Meeting*, Pittsburgh, PA, Oct.28-Nov.2, 2012.
- (11) Swapnil Gandhi and Eric Nuxoll, "Pulsed Release Through Layered Polymers" *AICHE Annual Meeting*, Pittsburgh, PA, Oct.28-Nov.2, 2012.
- (10) Ann O'Toole and Eric Nuxoll, "Material-based approach to implant infection mitigation" *AICHE Annual Meeting*, Minneapolis, MN, Oct.16-21, 2011.
- (9) Swapnil Gandhi and Eric Nuxoll, "Barrier-Mediated Pulsatile Release" *AICHE Annual Meeting*, Minneapolis, MN, Oct.16-21, 2011.
- (8) Swapnil Gandhi and Eric Nuxoll, "Barrier-Mediated Pulsed Release" *AICHE Annual Meeting*, Nashville, TN, Nov.8-13, 2009.
- (7) Eric Nuxoll, Marc A. Hillmyer and Ronald A. Siegel, "Size-Selective Mass Transport via a Block Polymer / Micromachined Silicon Composite Membrane" *AICHE Annual Meeting*, Nashville, TN, Nov.8-13, 2009.
- (6) Eric E. Nuxoll, Marc A. Hillmyer and Ronald A. Siegel, "Development Of A Nanoporous Polymer Membrane For Implantable Drug Delivery Devices" *AICHE Annual Meeting*, Salt Lake City, UT, Nov.4-9, 2007.
- (5) Eric E. Nuxoll, Marc A. Hillmyer and Ronald A. Siegel, "Nanoporous Silicon Nitride Membranes Via Triblock Terpolymer Templating" *AICHE Annual Meeting*, Salt Lake City, UT, Nov.4-9, 2007.
- (4) Eric E. Nuxoll, Tsutomu Shimotori, William A. Arnold and Edward L. Cussler, "Iron Nanoparticles in Reactive Environmental Barriers", *AICHE Annual Meeting*, San Francisco, CA, Nov.16-21, 2003.
- (3) Eric E. Nuxoll, Nancy K. Lape, Ronald A. Siegel and Edward L. Cussler, "Reactive Barrier Membranes: Theory & Experiment", *Controlled Release Society Annual Meeting*, Glasgow, Scotland, July 19-23, 2003.
- (2) Eric E. Nuxoll, William A. Arnold, and Edward L. Cussler, "Kinetic Control of Barrier Films", *AICHE Annual Meeting*, Indianapolis, IN, Nov.3-8, 2002.
- (1) Eric E. Nuxoll and Wudneh Admassu, "Remediation of Radionuclide-contaminated Aquifer using Biosorption Remediation Process", *ASEE National Meeting*, Seattle, WA, June, 1998.