ELLEN G. LAUCHNOR

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Education

Ph. D. – Chemical Engineering **2011**
Oregon State University, Corvallis, OR
Dissertation: Inhibition, Gene Expression, and Modeling of Ammonia Oxidation in Biofilms of *Nitrosomonas europaea*

B. S. – Chemical and Biological Engineering **2005**
Montana State University, Bozeman, MT

Current Research Interests

- Biofilms in wastewater treatment and biological nitrogen removal
- Impact of emerging contaminants on wastewater treatment processes
- Fundamentals and applications of microbially induced mineral formation
- Reactive transport in biofilm systems

Professional Appointments

Assistant Professor of Environmental Engineering **August 2014 – present**
Civil Engineering Department, Montana State University, Bozeman MT

Instructor, Environmental Engineering **August 2013 – May 2014**
Civil Engineering Department, Montana State University, Bozeman MT

Postdoctoral Researcher **April 2011 – August 2014**
Center for Biofilm Engineering, Montana State University, Bozeman, MT

Publications

NOTE: E.G. Swogger is maiden name, used before August 2009.

Peer-Reviewed Publications

Lauchnor E. G., L. Semprini. (**2013**) Inhibition of phenol on the rates of ammonia oxidation by Nitrosomonas europaea grown under batch, continuous fed, and biofilm conditions. *Water Research*, *47*, 4692-4700.

Lauchnor E. G., L. N. Schultz, S. Bugni, A. C. Mitchell, A. B. Cunningham, R. Gerlach. (**2013**) Bacterially induced calcium carbonate precipitation and strontium co-precipitation in a porous media flow system. *Environmental Science and Techno*logy, *47* (3), 1557-1564.

Lauchnor E. G., T. Radniecki, and L. Semprini. (**2011**) Inhibition and gene expression of *Nitrosomonas europaea* biofilms exposed to phenol and toluene. *Biotechnology and Bioengineering*, *108*, 750–757.

Mitchell, A. C., S. L. Parks, A. Phillips, **E. G. Lauchnor**, A. B. Cunningham, R. Gerlach. Kinetics of calcite precipitation by ureolytic bacteria under aerobic and anaerobic conditions. (**Submitted March, 2014**) *Ecological Engineering*.

Phillips A. J., R. Gerlach, **E. G. Lauchnor**, A. C. Mitchell, A. B. Cunningham, and L. Spangler. (**2013**) Engineering applications of ureolytic biomineralization: a review. *Biofouling*, *29* (6), 715-733.

Phillips A. J., **E. G. Lauchnor**, J. Eldring, R. Esposito, A. C. Mitchell, R. Gerlach, A. B. Cunningham, and L. H. Spangler. (**2013**) Potential CO_2 leakage reduction through biofilm-induced calcium carbonate precipitation. *Environmental Science and Techno*logy, *47* (1), 142-149.

Cunningham A. B., **E. G. Lauchnor**, J. Eldring, R. Esposito, A. C. Mitchell, R. Gerlach, A. J. Phillips, A. Ebigbo, and L. H. Spangler. (**2013**) Abandoned Well CO_2 Leakage Mitigation Using Biologically Induced Mineralization: Current Progress and Future Directions. *Greenhouse Gases: Science and Technology*, *3*, 40-49.

James G., **E. G. Swogger**, R. Wolcott, E.D. Pulcini, P. Secor, J. Sestrich, J.W. Costerton, P.S. Stewart. (**2008**). Biofilms in Chronic Wounds. *Wound Repair and Regeneration*, *16*, 37-44.

Publications submitted

Lauchnor, E. G., L. Semprini, B. D. Wood. Simulations of dissolved oxygen and pH profiles in *N. europaea* biofilms using a 2-D reactive transport model. Submitted to *Biotechnology and Bioengineering*.

Hommel, J., **E. G. Lauchnor**, A. Phillips, R. Gerlach, A. B. Cunningham, R. Helmig, A. Ebigbo, H. Class. A revised model for microbially induced calcite precipitation – improvements and new insights based on recent experiments. Submitted to *Water Resources Research.*

Keesano, M., R. D. Gardner; K. Moll; **E. Lauchnor**; R. Gerlach; B. M. Peyton; R. C. Sims. Dissolved inorganic carbon enhanced growth, nutrient uptake, and lipid accumulation in wastewater grown microalgal biofilms. Submitted to *Bioresource Technology.*

Publications in preparation

Lauchnor, E. G., D. Topp, A. E. Parker, R. Gerlach. Whole cell kinetics of ureolysis by *Sporosarcina pasteurii*. In preparation for *Applied Microbiology and Biotechnology*

Bray, J. M., **E. G. Lauchnor**, J. D. Seymour, R. Gerlach, G. D. Redden, Y. Fujita, S. L. Codd. Mineral precipitation impact of pore scale dynamics and porous media structure determined by µ-CT and MRI. In preparation for *Environmental Science and Technology.*

Book Chapters

Radniecki, T. S., and **E. G. Lauchnor. "**Investigating *Nitrosomonas europaea* stress biomarkers in batch, continuous culture and biofilm reactors" In: Martin G. Klotz and Lisa Y. Stein, editors: Methods in Enzymology, Vol. 496, Burlington: Academic Press, **2011**, pp. 217-246.

James G., **E. G. Swogger**, and E. deLancey-Pulcini. "Microbial Ecology of Human Skin and Wounds" In: The Role of Biofilms in Device-Related Infections. Shirtliff M, Leid JG, editors. Springer Berlin Heidelberg. **2009**, pp 1-14.

Oral Presentations

Conferences:

Lauchnor, E. G., L. Schultz, A. C. Mitchell, R. Gerlach. "Microbially induced $CaCO_3$ mineralization and strontium co-precipitation in porous media reactors" *4th International Conference on Porous Media and its Applications in Science, Engineering and Industry*, Potsdam, Germany, June 17–22, 2012.

Swogger, E. G., L. Semprini. "*Nitrosomonas europaea* biofilms exposed to phenol and toluene" *Subsurface Biosphere Initiative Conference*, Oregon State University, Corvallis, OR, July 23-24, 2009.

Swogger E. G. "Evaluation of Wound Biofilms" Regional AIChE Conference, Oregon State University, Corvallis, OR, April 2005.

Invited seminars:

Lauchnor, E. G., "Inhibition of ammonia oxidizing bacteria in biofilms" Molecular Biosciences Program Seminar series, Montana State University, September 10, 2014.

Lauchnor, E. G. "Biofilms of the Ammonia Oxidizing Bacterium *Nitrosomonas europaea*" College of Engineering Graduate Seminar, Oregon State University, May 14, 2010.

Swogger, E. G., L. Semprini. "*Nitrosomonas europaea* biofilms exposed to phenol and toluene" Environmental Engineering Graduate Seminar, Oregon State University, April 7, 2009.

Poster Presentations

Lauchnor E. G., L. Schultz, A. Mitchell, D. Topp, A. B. Cunningham, R. Gerlach. "Strontium co-precipitation during biomineralization of calcite in porous media using differing treatment strategies" *American Geophysical Union Fall Meeting*. San Francisco, Dec. 9-13, 2013.

Lauchnor E. G., A. J. Phillips, A. B. Cunningham, R. Gerlach. "Laboratory-scale column studies to evaluate ureolytically driven $CaCO_3$ mineralization" *American Geophysical Union Fall Meeting*. San Francisco, Dec. 3-7, 2012.

Lauchnor E. G., T. Radniecki, and L. Semprini. "Global gene expression comparisons between *Nitrosomonas europaea* biofilms and planktonic cells" *American Society for Microbiology 110th General Meeting.* San Diego, CA, May, 2010.

Swogger E. G., T. Radniecki, and L. Semprini. "Inhibition and cometabolism of toluene and phenol in *Nitrosomonas europaea* biofilms" *Processes in Biofilms 2009: From Fundamentals to Applications.* University of California, Davis, CA, September 13-16, 2009.

Swogger, E. G., Radniecki, T.S. and L. Semprini, "Biofilms of *Nitrosomonas europaea* exposed to phenol and toluene" *1st International Conference on Nitrification*, Louisville, Kentucky, July 6-10, 2009.

Swogger E. G., T. Radniecki, and L. Semprini. "Growth and Transcriptional Response of *Nitrosomonas europaea* Biofilms Exposed to Phenol" *American Society for Microbiology 108th General Meeting.* Boston, MA, June 1-5, 2008.

Swogger E. G., T. Radniecki, and L. Semprini. "Transcriptional and Physiological Response of *Nitrosomonas europaea* Biofilms Exposed to Phenol" *7th International Symposium for Subsurface Microbiology*, Shizuoka, Japan, November 16-21, 2008.

Courses Taught

Montana State University

EENV 340: Principles of Enviromental Engineering	**2013 –2014**
EBIO 439: Downstream Processing	**Spring 2013**

Professional Affiliations

American Geophysical Union

American Chemical Society

Tau Beta Pi – Engineering Honor Society inducted 2005 (as Ellen Swogger)