

# MATTHEW S. REHMANN

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## EDUCATION

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**University of Delaware**, Newark, DE

Ph.D. Candidate

Anticipated March 2016

Chemical and Biomolecular Engineering

GPA: 3.94 / 4.00

Relevant coursework: Introduction to Polymer Science, Random Phenomena (statistics for experiment design)

**University of Pennsylvania**, Philadelphia, PA

Bachelor of Science in Engineering, *Magna Cum Laude*

May 2010

Chemical and Biomolecular Engineering

GPA: 3.79 / 4.00

Senior design project: Acetone, butanol, ethanol (ABE) fermentation of sugar cane in Brazil

## RESEARCH EXPERIENCE

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**Graduate Research Assistant, University of Delaware**

Summer 2011 – present

Advisor: Prof. April Kloxin

- Designed and characterized modular, synthetic polymer networks with desired properties for cell culture
- Evaluated the accuracy of polymer network mesh size relationships for predicting macromolecule release
- Applied statistical design of experiments methodology to determine optimal cell culture conditions
- Developed, optimized, and documented experimental procedures as the first graduate student in a new lab
- Mentored seven undergraduates and high school students in research

**Chemistry-Biology Interface Training Program, University of Delaware**

Winter 2011 – Spring 2011

- Participated in interdisciplinary research rotations in molecular biology and materials science laboratories

## LEADERSHIP AND COMMUNICATION EXPERIENCE

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- Co-founder and DJ for Science Rocks!, a weekly science-themed radio show on WVUD 91.3 FM (2013 – 2015)
- IRS-certified volunteer tax preparer, VITA program at Delaware Alliance for Community Advancement (2015)
- Teaching assistant for Mass Transfer Operations (a process design course; 2012) and Thermodynamics (2013)
- Technical Communication Fellow at Penn – edited technical writing for Penn Engineering students (2009 – 2010)
- Team Leader at Chick-fil-A – managed a team of 10-15 retail employees (2007 – 2008)

## SKILLS

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**Protein and peptide characterization:** Reverse-phase HPLC, mass spectrometry (ESI and MALDI), circular dichroism, UV-Vis spectroscopy, SDS-PAGE, controlled drug release

**Polymer synthesis:** Polymer networks, click chemistry (especially in water), basic organic wet chemistry for modification of commercial polymers, solid phase peptide synthesis

**Polymer characterization:** Rheometry, dynamic light scattering, <sup>1</sup>H-NMR

**Cell culture and analysis:** Mammalian and bacterial cell culture, DNA electrophoresis, 3-D cell culture, polymer-mediated gene delivery, flow cytometry, quantitative PCR, fluorescence and confocal microscopy

**Statistics:** Design of experiments (factorial, response surface, and Plackett-Burman designs), Minitab software

**Process design:** ASPEN PLUS

## PUBLICATIONS

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- **M.S. Rehmman**, J.I. Luna, E. Maverakis, A.M. Kloxin. "Tuning microenvironment modulus and biochemical composition promotes human mesenchymal stem cell tenogenic differentiation." *Submitted to Journal of Biomedical Materials Research Part A on September 21 (manuscript available on request)*.
- **M.S. Rehmman**, A.C. Garibian, and A.M. Kloxin. "Hydrolytically degradable thiol-ene hydrogels for protein release." *Macromolecular Symposia* 329 (Jul. 2013) 58-65
- **M.S. Rehmman**, A.M. Kloxin. "Tunable and dynamic soft materials for three-dimensional cell culture." *Soft Matter* 9 (2013) 6737-6746.
- A.M. Hilderbrand, E.M. Ovadia, **M.S. Rehmman**, P.M. Kharkar, C. Guo, A.M. Kloxin. "4-D biomaterials for stem cell research." *In preparation (manuscript available on request)*.
- P.M. Kharkar, **M.S. Rehmman**, K.M. Skeens, E. Maverakis, A.M. Kloxin. "Thiol-ene click hydrogels for therapeutic delivery." *Submitted to ACS Biomaterials Science and Engineering on October 4 (manuscript available on request)*.
- J. Winkler, **M. Rehmman**, K. C. Kao. "Novel *Escherichia coli* hybrids with enhanced butanol tolerance." *Biotechnology Letters* 32 (Jul. 2010) 915-920.

## SELECTED PRESENTATIONS

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- Biomedical Engineering Society (BMES) Annual Meeting, San Antonio, TX, October 2014. *Poster*.
- Frontiers at the Chemistry-Biology Interface Symposium, Baltimore, MD, May 2014. *Poster*.
- American Institute of Chemical Engineers (AIChE) National Conference, San Francisco, CA, November 2013. *Oral*.
- Frontiers at the Chemistry-Biology Interface Symposium, College Park, MD, May 2013. *Poster*.
- National IDeA Symposium for Biomedical Research Excellence, Washington, DC, June 2012. *Poster*.
- Frontiers at the Chemistry-Biology Interface Symposium, Philadelphia, PA, April 2012. *Poster*.

## AWARDS

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- Saurabh A. Palkar Graduate Award for Mentoring 2014  
(Given to one graduate student every year for excellence in undergraduate mentoring)
- 2013-2014 Most Accessed *Macromolecular Symposia* articles (doi: 10.1002/masy.201200133) 2014
- 2013 Most Accessed *Soft Matter* Articles (doi: 10.1039/C3SM50217A) 2014
- Featured Poster – Regenerative Medicine Category (IDeA Symposium) 2012
- Robert L. Pigford Fellowship 2010-2011
- NIH Chemistry-Biology Interface Training Program 2010-present  
(Interdisciplinary training program featuring research rotations in materials science and molecular biology)
- Faculty Appreciation Award, Chemical & Biomolecular Eng. (Penn) 2010