Amber M. Hilderbrand

Chemical and Biomolecular Engineering
University of Delaware
150 Academy Street, Colburn Laboratory Office #219, Newark, DE 19711

email: ahilder@udel.edu
phone: (302) 831-4528

EDUCATION:

University of Delaware, Newark, DE — Fall 2013-Present
Candidate for Doctor of Philosophy
Chemical and Biomolecular Engineering — Cumulative GPA: 3.64/4.00

Iowa State University, Ames, IA — Fall 2009-Spring 2013
Bachelors of Science in Chemical Engineering, *Cum Laude*
Chemical and Biological Engineering — Cumulative GPA: 3.41/4.00

RESEARCH EXPERIENCE:

University of Delaware, Newark, DE — August 2013-Present
Graduate Research Assistant
Advisor: Dr. April M. Kloxin

- Establishing a three-dimensional (3D), hydrogel-based culture system that incorporates collagen mimetic peptides (CMPs) to impart a fibrillar structure over multiple length scales
- Designing and characterizing CMPs to promote self-assembly from triple helices to fibrils in solution
- Determining mechanical properties of hydrogel-based materials with covalently incorporated CMPs using rheology

Iowa State University, Ames, IA — August 2012-August 2013
Undergraduate Research Assistant
Advisor: Dr. Kaitlin Bratlie

- Induced polarization of Tumor Associated Macrophages using interleukin-4 and lipopolysaccharide and incubated with functionalized polystyrene particles to reverse polarization
- Performed various biochemical assays to determine extent of cell repolarization
    - Determined that particles did not change phenotype, but induced changes in pro- or anti-inflammatory markers

RESEARCH SKILLS:

Peptide and protein characterization: Reverse-phase HPLC, mass spectrometry (ESI, LC-MS), circular dichroism (CD), Transmission Electron Microscopy (TEM), Atomic Force Microscopy (AFM), UV-Vis spectroscopy, dynamic light scattering (DLS)
Polymer Synthesis: Solid phase peptide synthesis, small molecule synthesis, conjugation reactions for modification of commercial polymers, click chemistry (thiol-ene), fragment condensation
Polymer Characterization: Rheology, ^{1}H-NMR
Cell culture and analysis: Mammalian cell culture (tumor associated macrophages, 3T3 fibroblasts, hMSCs), cell viability assays, enzymatic assays (ELISA), immunocytochemistry
Statistics: Minitab software, design of experiments

PUBLICATIONS, PRESENTATIONS, AND AWARDS:

- **AM Hilderbrand**, C Guo, AM Kloxin, "Multifunctional biomaterials with structural complexity," World Biomaterials Congress, May 2016, Montreal, QC. *Poster.*
- **AM Hilderbrand***, EM Ovadia*, MS Rehmann, PM Kharkar, C Guo, AM Kloxin, "4D biomaterials for stem cell research," *Curr. Opin. Solid State Mater. Sci.* **20**, 212-224, 2016. *Equal contribution