

APRIL M. KLOXIN, PH.D.

Chemical and Biomolecular Engineering and
Materials Science and Engineering
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Education

Ph.D. in Chemical Engineering

May 2009

Dissertation: "Photolabile hydrogels for dynamic tuning of physical and chemical properties to probe cell-cell and cell-material interactions"

Research advisor: Prof. Kristi S. Anseth

Department of Chemical and Biological Engineering, University of Colorado, Boulder, CO

M.S. in Chemical Engineering

Dec. 2004

Thesis: "Synthesis and characterization of antibacterial PEG hydrogels"

Research advisors: Prof. Richard J. Spontak and Prof. Stuart L. Cooper

Department of Chemical and Biomolecular Engineering, North Carolina State University, Raleigh, NC

B.S. in Chemical Engineering, Summa Cum Laude, University Scholar

May 2001

Department of Chemical Engineering, North Carolina State University, Raleigh, NC

Professional Experience

Affiliated Member

Breast Cancer Research Group, Helen F. Graham Cancer Center and Research Institute, 2015-
Christiana Care Health System

Center for Biomanufacturing Science and Technology, University of Delaware 2015-

Biomedical Engineering, University of Delaware 2013-

Systems Biology of Cells in Engineered Environments (SBE2), NSF IGERT Program 2012-

Center for Bioinformatics & Computational Biology (CBCB), 2011-

Delaware Biotechnology Institute (DBI)

Chemistry-Biology Interface (CBI) Program, University of Delaware 2011-

Associate Professor

2018-

Departments of Chemical and Biomolecular Engineering and Materials Science and Engineering,
University of Delaware, Newark, DE

Assistant Professor

2011-2018

Departments of Chemical and Biomolecular Engineering and Materials Science and Engineering,
University of Delaware, Newark, DE

HHMI Postdoctoral Research Associate

2009-2011

Research advisor: Prof. Kristi S. Anseth

Collaborators: Prof. Vivek Balasubramaniam, Prof. Leslie Leinwand, and Prof. Bradley B. Olwin

Howard Hughes Medical Institute and the University of Colorado, Boulder, CO

Graduate Research Assistant

Chemical and Biological Engineering, University of Colorado, Boulder, CO 2004-2009

Chemical and Biomolecular Engineering, North Carolina State University, Raleigh, NC 2002-2004

Process Engineer

2001-2002

Fibermaking Process Development, Corning, Inc., Wilmington, NC

Chemical Engineering Intern

1999, 2000

Over the Counter Pharmaceutical Manufacturing, Procter and Gamble, Greensboro, NC

Honors and Awards

- ACS PMSE Arthur K. Doolittle Award 2018
- National IDeA Symposium Biomedical Research Excellence Young Investigator Travel Award 2018
- American Chemical Society POLY Researcher of the Month 2018
- American Chemical Society PMSE Young Investigator Honoree 2017
- Komen Career Catalyst Research Award 2016
- University of Delaware Research Foundation Strategic Initiatives Award 2014
- Pew Scholar in Biomedical Sciences 2013
- National Science Foundation CAREER Award 2013
- Burroughs Wellcome Fund Collaborative Research Grant & University of California, Davis Visiting Scholar 2013
- University of Delaware Research Foundation Award 2012
- Western Association of Graduate Schools Innovation in Technology Award 2010
- Max S. Peters Outstanding Graduate Research Award 2009
- Excellence in Graduate Polymer Research Award, ACS Polymer Chemistry 2008
- US Department of Education's GAANN Fellowship 2005-2009
- NASA Graduate Student Research Program Fellowship 2005-2008

Publications (reverse chronological order, corresponding author underlined, *undergraduate authors italicized*)
(Citations, Jan. 20, 2019, Google Scholar: http://scholar.google.com/citations?user=MVdc_X0AAAAJ&hl=en)

Edited journals

Guest Editor for special issue of *Current Opinion in Biotechnology* [Impact Factor: 8], 2016, on the topic of "Tissue, cell and pathway engineering," <http://dx.doi.org/10.1016/j.copbio.2016.06.004>.

Peer-reviewed

Publications from work performed at UD (2011-present)

1. LA Sawicki, EM Ovadia, L Pradhan, JE Cowart, KE Ross, CH Wu, AM Kloxin, "Tunable synthetic extracellular matrices to investigate breast cancer response to biophysical and biochemical cues," *APL Bioengineering*, **Accepted**, 2019.
2. PJ LeValley, AM Kloxin, "Chemical Approaches to Dynamically Modulate the Properties of Synthetic Matrices," *ACS Macro Letters*, **8**, 7-16, 2018. [Impact Factor: 6.1]
Featured as ACS Editors' Choice
3. PJ LeValley, MW Tibbitt, B Noren, PM Kharkar, AM Kloxin, KS Anseth, M Toner, J Oakey, "Immunofunctional Photodegradable Poly(ethylene glycol) Hydrogel Surfaces for the Capture and Release of Rare Cells," *Colloids and Surfaces B: Biointerfaces*, **174**, 483-492, 2018. [Impact Factor: 3.9]
4. H Wu, PJ LeValley, T, Luo, AM Kloxin, KL Kiick, "Manipulation of Glutathione-Mediated Degradation of Thiol-Maleimide Conjugates," *Bioconjugate Chemistry*, **29**, 3595-3605, 2018. [Impact Factor: 4.8]
5. ME Smithmyer, CC Deng, SE Cassel, PJ LeValley, BS Sumerlin, AM Kloxin, "Self-healing boronic acid-based hydrogels for 3D co-cultures," *ACS Macro Letters*, **7**, 1105-1110, 2018. DOI: 10.1021/acsmacrolett.8b00462. [Citations: 5; Impact Factor: 6.1]
6. ME Smithmyer, *JB Spohn*, AM Kloxin, "Probing fibroblast activation in response to extracellular matrix cues with well-defined culture platform," *ACS Biomaterials Science & Engineering*, **4**, 3304-3316, 2018. DOI: 10.1021/acsbiomaterials.8b00491 [Citations: 1; Impact Factor: 4.4]

7. PJ LeValley, B Noren, PM Kharkar, **AM Kloxin**, JC Gatlin, J Oakey, "Fabrication of Functional Biomaterial Microstructures by in Situ Photopolymerization and Photodegradation," *ACS Biomaterials Science & Engineering*, **4**, 3078-3087, 2018. DOI: 10.1021/acsbiomaterials.8b00350 [Citations: 1; Impact Factor: 4.4]
8. PJ LeValley, EO Ovadia, CA Bresette, LA Sawicki, E Maverakis, S Bai, **AM Kloxin**, "Design of functionalized cyclic peptides through orthogonal click reactions for cell culture and targeting applications," *Chemical Communications*, **54**, 6923-6926, 2018. DOI: 10.1039/C8CC03218A. [Impact factor: 6.3]
Special Issue: Emerging Investigators
9. LJ Macdougall, KL Wiley, **AM Kloxin**, AP Dove, "Design of Synthetic Extracellular Matrices for Probing Breast Cancer Cell Growth Using Robust Cytocompatible Nucleophilic Thiol-yne Addition Chemistry," *Biomaterials*, **178**, 435-447, 2018. DOI: 10.1016/j.biomaterials.2018.04.046. [Citations: 5; Impact factor: 8.4]
10. EO Ovadia, DW Colby, **AM Kloxin**, "Designing photopolymerized synthetic matrices for three-dimensional culture and differentiation of induced pluripotent stem cells," *Biomaterials Science*, **6**, 1358-1370, 2018. DOI: 10.1039/c8bm00099a [Citations: 1; Impact factor: 5.8]
11. NJ Smith, K Rohlfing, LA Sawicki, PM Kharkar, SJ Boyd, **AM Kloxin**, JM Fox, "Fast, Irreversible Modification of Cysteines through Strain Releasing Conjugate Additions of Cyclopropenyl Ketones," *Organic & Biomolecular Chemistry*, **16**, 2164-2169, 2018. DOI: 10.1039/C8OB00166A [Citations: 4; Impact factor: 3.5]
12. LA Sawicki, LH Choe, KH Lee, KL Wiley, **AM Kloxin**, "Isolation and identification of proteins secreted by cells cultured within synthetic hydrogel-based matrices," *ACS Biomaterials Science and Engineering*, **4**, 836-845, 2018. DOI: 10.1021/acsbiomaterials.7b00647 [Citations: 4; Impact Factor: 4.4]
Featured as ACS Editors' Choice
13. MS Rehmann, KM Skeens, PM Kharkar, EM Ford, E Maverakis, KH Lee, **AM Kloxin**, "Tuning and predicting mesh size and protein release from step growth hydrogels," *Biomacromolecules*, **18**, 3131-3142, 2017. DOI: 10.1021/acs.biomac.7b00781 [Citations: 3; Impact Factor: 5.25]
14. PM Kharkar, RA Scott, LP Olney, PF Levalley, E Maverakis, KL Kiick, **AM Kloxin**, "Controlling the release of small, bioactive proteins via dual mechanisms with therapeutic potential," *Advanced Healthcare Materials*, **6**, 1700713, 2017. DOI: 10.1002/adhm.201700713 [Citations: 4; Impact Factor: 5.76]
15. C Guo, H Kim, EM Ovadia, CM Mourafetis, M Yang, W Chen, **AM Kloxin**, "Bio-orthogonal conjugation and enzymatically triggered release of proteins within multi-layered hydrogels," *Acta Biomaterialia*, **56**, 80-90, 2017. DOI: 10.1016/j.actbio.2017.04.002 [Citations: 7; Impact Factor: 6.0]
16. LA Sawicki, **AM Kloxin**, "Light-mediated Formation and Patterning of Hydrogels for Cell Culture Applications," *Journal of Visual Experiments* (115), e54462, 2016. DOI: 10.3791/54462 [Citations: 12; Impact Factor: 1.1]
17. AM Hilderbrand, EM Ovadia, MS Rehmann, PM Kharkar, C Guo, **AM Kloxin**, "Biomaterials for 4D stem cell culture," *Current Opinion in Solid State Materials*, **20**, 212-224, 2016. DOI: 10.1016/j.cossms.2016.03.002 [Citations: 17; Impact Factor: 5.1]
18. MS Rehmann, JI Luna, E Maverakis, **AM Kloxin**, "Tuning microenvironment modulus and biochemical composition promotes human mesenchymal stem cell tenogenic differentiation," *Journal of Biomedical Materials Research Part A*, **104**, 1162-1174, 2016. DOI: 10.1002/jbm.a.35650 [Citations: 21; Impact Factor: 3.2]
19. PM Kharkar, MS Rehmann, KM Skeens, E Maverakis, **AM Kloxin**, "Thiol-ene click hydrogels for therapeutic delivery," *ACS Biomaterials Science and Engineering*, **2**, 165-179, 2016. DOI: 10.1021/acsbiomaterials.5b00420 [Citations: 42; Impact Factor: 4.4]
20. PM Kharkar, KL Kiick, **AM Kloxin**, "Design of thiol- and light-sensitive degradable hydrogels using Michael-type addition reactions," *Polymer Chemistry*, **6**, 5565-5574, 2015. DOI: 10.1039/C5PY00750J [Citations: 55; Impact Factor: 5.5]

Special Issue: Emerging Investigators

21. KA Tran, MY Cheng, A Mitra, H Ogawa, VY Shi, LP Olney, **AM Kloxin**, E Maverakis, “MEK inhibitors and their potential in the treatment of advanced melanoma: the advantages of combination therapy,” *Drug Design, Development and Therapy*, **10**, 43-52, 2015. DOI: 10.2147/DDDT.S93545 [Citations: 31; Impact Factor: 3.0]
22. E Maverakis, LA Cornelius, GM Bowen, T Phan, FB Patel, S Fitzmaurice, Y He, B Burrall, C Duong, **AM Kloxin**, H Sultani, R Wilken, SR Martinez, F Patel, “Metastatic Melanoma – A Review of Current and Future Treatment Options,” *Acta Dermato-Venereologica*, **95**, 516-527, 2015. DOI: 10.2340/00015555-2035 [Citations: 101; Impact Factor: 3.7]
23. LA Sawicki, **AM Kloxin**, “Design of thiol–ene photoclick hydrogels using facile techniques for cell culture applications,” *Biomaterials Science*, **2**, 1612-1626, 2014. DOI: 10.1039/c4bm00187g [Citations: 53; Impact Factor: 5.8]

Special Issue: Stem cell-materials interactions.

*Featured on the front cover of the issue and in SLJ Michel, “Report from the Seventh Annual *Frontiers at the Chemistry Biology Interface Symposium*,” *ACS Chem. Biol.* **9**, 1915–1917, 2014.*

24. PM Kharkar, **AM Kloxin**, **KL Kiick**, “Dually degradable click hydrogels for controlled degradation and protein release,” *Journal of Materials Chemistry B*, **2**, 5511-5521, 2014. DOI: 10.1039/C4TB00496E [Citations: 37; Impact Factor: 4.9]

Featured on the front cover of the issue

25. ME Smithmyer, LA Sawicki, **AM Kloxin**, “Hydrogel scaffolds as *in vitro* models to study fibroblast activation in wound healing and disease,” *Biomaterials Science*, **2**, 634-650, 2014. DOI: 10.1039/C3BM60319A [Citations: 67; Impact Factor: 5.8]

Special Issue: Emerging Investigators

*Featured as one of the 10 most downloaded papers for *Biomaterials Science* in 2014*

26. P Fischer [LeValley], M Tibbitt, **A Kloxin**, K Anseth, and J Oakey, “Photodegradable hydrogels for selective capture and release of mammalian cells,” *Biomedical Sciences Instrumentation*, **50**, 62-67, 2014. <http://www.ncbi.nlm.nih.gov/pubmed/25405405> [Citations: 3; Impact Factor: N/A]
 27. MS Rehmann, *AC Garibian*, **AM Kloxin**, “Degradable thiol–ene hydrogels for protein release,” *Macromolecular Symposia*, **329**, 58-65, 2013. DOI: 10.1002/masy.201200133 [Citations: 11; Impact Factor: N/A]
 28. PM Kharkar, **KL Kiick**, **AM Kloxin**, “Designing hydrogels for orthogonal control of degradable cell microenvironments,” *Chemical Society Reviews*, **42**, 7335-7372, 2013. DOI: 10.1039/C3CS60040H [Citations: 321; Impact Factor: 34]
 29. MS Rehmann, **AM Kloxin**, “Tunable and dynamic soft materials for three-dimensional cell culture,” *Soft Matter*, **9**, 6737-6746, 2013. DOI: 10.1039/C3SM50217A [Citations: 17; Impact Factor: 3.9]
- Special Issue: Emerging Investigators*
- Featured as one of the most downloaded papers for *Soft Matter* in 2013*
30. DD McKinnon, **AM Kloxin**, **KS Anseth**, “Synthetic hydrogel platform for three-dimensional culture of embryonic stem cell-derived motor neurons,” *Biomaterials Science*, **1**, 460-469, 2013. DOI: 10.1039/C3BM00166K [Citations: 60; Impact Factor: 5.8]

Publications from work performed at prior institutions (2006-2011)

31. MW Tibbitt, **AM Kloxin**, *LA Sawicki*, **KS Anseth**, “Mechanical properties and degradation of chain and step polymerized photodegradable hydrogels,” *Macromolecules*, **46**, 2785-2792, 2013. DOI: 10.1021/ma302522x [Citations: 96; Impact Factor: 5.5]

32. MW Tibbitt, **AM Kloxin**, KS Anseth, “Modeling controlled photodegradation in optically thick hydrogels,” *Journal of Polymer Science Part A: Polymer Chemistry*, **9**, 1899-1911, 2013. DOI: 10.1002/pola.26574 [Citations: 21; Impact Factor: 3.2]
33. **AM Kloxin**, KJR Lewis, CA DeForest, G Seedorf, MW Tibbitt, V Balasubramaniam, and KS Anseth, “Responsive culture platform to examine the influence of microenvironmental geometry on cell function in 3D,” *Integrative Biology*, **4**, 1540-1549, 2012. DOI: 10.1039/C2IB20212C [Citations: 42; Impact Factor: 3.4]
34. H Wang, *SM Haeger*, **AM Kloxin**, LA Leinwand, KS Anseth, “Redirecting valvular myofibroblasts into dormant fibroblasts through light-mediated reduction in substrate modulus,” *PLoS One*, **7**, e39969, 2012. DOI: 10.1371/journal.pone.0039969 [Citations: 129; Impact Factor: 3.2]
35. MW Tibbitt, *BW Han*, **AM Kloxin**, KS Anseth, “Synthesis and application of photodegradable microspheres for spatiotemporal control of protein delivery,” *Journal of Biomedical Materials Research Part A*, **100**, 1647-1654, 2012. DOI: 10.1002/jbm.a.34107 [Citations: 32; Impact Factor: 3.2]
36. **AM Kloxin**, MW Tibbitt, and KS Anseth, “Synthesis of photodegradable hydrogels as dynamically tunable cell culture platforms,” *Nature Protocols*, **5**, 1867-1887, 2010. DOI: 10.1038/nprot.2010.139 [Citations: 215; Impact Factor: 11.2]
37. MW Tibbitt, **AM Kloxin**, KU Dyamenahalli, and KS Anseth, “Controlled two-photon photoerosion of PEG hydrogels to study and manipulate subcellular interactions on soft materials,” *Soft Matter*, **6**, 5100-5108, 2010. DOI: 10.1039/C0SM00174K [Citations: 94; Impact Factor: 3.9]
38. **AM Kloxin**, CJ Kloxin, CN Bowman, and KS Anseth, “Mechanical properties of cellularly responsive hydrogels and their experimental determination,” *Advanced Materials*, **22**, 3484-3494, 2010. DOI: 10.1002/adma.200904179 [Citations: 311; Impact Factor: 18.9]
39. **AM Kloxin**, MW Tibbitt, AM Kasko, JA Fairbairn, and KS Anseth, “Tunable hydrogels through controlled photodegradation for external manipulation of the cell microenvironment,” *Advanced Materials*, **22**, 61-66, 2010. DOI: 10.1002/adma.200900917 [Citations: 179; Impact Factor: 18.9]
40. **AM Kloxin**, JA Benton, and KS Anseth, “*In situ* elasticity modulation with dynamic substrates to direct cell phenotype,” *Biomaterials*, **33**, 1-8, 2010. DOI: 10.1016/j.biomaterials.2009.09.025 [Citations: 335; Impact Factor: 8.3]
41. **AM Kloxin**, AM Kasko, CN Salinas, and KS Anseth, “Photolabile hydrogels for dynamic tuning of physical and chemical properties,” *Science*, **324**, 59-63, 2009. DOI: 10.1126/science.1169494 [Citations: 1185; Impact Factor: 34]
- Highlighted in* SM Jay and WM Saltzman, “Shining light on a new class of hydrogels,” *Nature Biotechnology*, **27**, 543-544, 2009.
- MP Lutolf, “Spotlight on hydrogels,” *Nature Materials*, **8**, 451-453, 2009.
- M Gross, “Light-guided hydrogels direct cell growth,” *Chemistry World*, April 2009.
42. VS Khire, **AM Kloxin**, *CC Clouch*, KS Anseth, and CN Bowman, “Synthesis, characterization and cleavage of linear polymers attached to silica nanoparticles formed using thiol-acrylate conjugate addition reactions,” *Journal of Polymer Science A: Polymer Chemistry*, **46**, 6896-6906, 2008. DOI: 10.1002/pola.22999 [Citations: 33; Impact Factor: 3.2]
43. CR Nuttelman, **AM Kloxin**, and KS Anseth, “Temporal changes in PEG hydrogel structure influence human mesenchymal stem cell proliferation and matrix mineralization,” *Advances in Experimental Medicine and Biology: Tissue Engineering*, **585**, 135-149, 2006. DOI: 10.1007/978-0-387-34133-0_10 [Citations: 16; Impact Factor: 1.9]

Spotlights

AM Kloxin and KS Anseth, "Protein gels on the move," *Nature*, **454**, 705-706, 2008 [News & Views]. [Citations: 7; Impact Factor: 38]

Book Chapters

LA Sawicki, **AM Kloxin**, "Biomaterials: Controlling properties over time to mimic the dynamic ECM" in *Mimicking the Extracellular Matrix: The Intersection of Matrix Biology and Biomaterials*. Editors: W. Murphy, G. Hudalla. Royal Society of Chemistry. 2015. ISBN: 978-1-84973-833-0

Patents

1. MULTIMODE DEGRADABLE HYDROGELS FOR CONTROLLED RELEASE OF CARGO SUBSTANCES
US20170258907A1
2. SELECTIVE CAPTURE AND RELEASE OF RARE CELLS USING PHOTODEGRADABLE HYDROGELS IN A MICROFLUIDIC PLATFORM
US20160153999A1
3. PHOTODEGRADABLE GROUPS FOR TUNABLE POLYMERIC MATERIALS
US 9,180,196 B2

Presentations and Seminars (reverse chronological order, **presenter bolded**)

Invited Conference Presentations (*June 2011-present*)

1. **AM Kloxin**, "Utilizing assembling and orthogonal chemistries for the design of materials with multiscale property control," American Chemical Society (ACS) Fall National Meeting, August 2018, Boston, MA. *Invited*.
2. **AM Kloxin**, "Utilizing light-mediated chemistries for the modulation of biomaterial properties," ACS Fall National Meeting, August 2018, Boston, MA. *Invited*.
3. **AM Kloxin**, "Designing and utilizing responsive materials with multi-scale properties for controlling cellular microenvironments," Gordon Research Conference on Signal Transduction from Engineered Extracellular Matrices, July 2018, Andover, New Hampshire. *Invited*.
4. **AM Kloxin**, "Designing synthetic extracellular matrices for the creation of controlled culture systems in the study of disease," American Institute of Chemical Engineers (AIChE) National Meeting, November 2017, San Francisco, CA. *Invited*.
5. **AM Kloxin**, "Design of responsive materials utilizing assembling and orthogonal chemistries for controlling cellular microenvironments," ACS Fall National Meeting, August 2017, Washington, DC. *Invited*.
6. **AM Kloxin**, "Design of hydrogel-based synthetic extracellular matrix mimics for fundamental studies of disease and regeneration," PMSE Young Investigators Symposium, ACS Spring National Meeting, April 2017, San Francisco, CA. *Invited*.
7. **AM Kloxin**, "Dynamic, biomimetic microenvironments for investigating disease progression," Pew Scholars Annual Meeting, March 2017, Santa Barbara, CA. *Invited*.
8. **AM Kloxin**, "Controlling structure within hydrogel-based synthetic extracellular matrices," Mid-Atlantic Soft Matter Workshop, February 2017, Newark, DE. *Invited Keynote Talk*.

9. **LA Sawicki**, AM Kloxin, “Controlling structure within hydrogel-based synthetic extracellular matrices through self-assembly and light-mediated reactions,” AIChE National Meeting, November 2016, San Francisco, CA. *Invited*.
10. **AM Kloxin**, “Controlling nanostructure for directing cell-matrix interactions,” ACS Fall National Meeting, August 2016, Philadelphia, PA. *Invited*.
11. AM Hilderbrand, C Guo, **AM Kloxin**, “Controlling nanostructure within hydrogels through self-assembly and light-mediated reactions,” Pacific Polymer Conference, December 2015, Kauai, HI. *Invited*.
12. LA Sawicki, PM Kharkar, C Guo, AM Hilderbrand, **AM Kloxin**, “Responsive biomaterials for controlling cellular microenvironments,” Photopolymerization Fundamentals, September 2015, Boulder, CO. *Invited*.
13. LA Sawicki, C Guo, AM Hilderbrand, **AM Kloxin**, “Responsive biomaterials for controlling the cell microenvironment,” 2015 User Meeting of Center for Nanophase Materials Science (CNMS), Oak Ridge National Laboratory, September 2015, Oak Ridge, TN. *Invited*.
14. LA Sawicki, **AM Kloxin**, “Design of hydrogels as synthetic extracellular matrix mimics using modular building blocks and facile techniques,” ACS Spring National Meeting, March 2015, Denver, CO. *Invited*.
15. MS Rehmann, PM Kharkar, **AM Kloxin**, “Responsive materials for the directing and delivering stem cells and therapeutics,” ACS Spring National Meeting, March 2015, Denver, CO. *Invited*.
16. LA Sawicki, PM Kharkar, **AM Kloxin**, “Responsive materials for controlling cellular microenvironments,” Polymer Chemistry Zing Conference, December 2014, Cancun, Mexico. *Invited*.
17. LA Sawicki, PM Kharkar, **AM Kloxin**, “Nanostructured and dynamic biomaterials for controlling the cell microenvironment,” BioNanoTechnology Plenary Session, AIChE Fall National Meeting, November 2014, Atlanta GA. *Invited*.
18. LA Sawicki, MS Rehmann, PM Kharkar, **AM Kloxin**, “Designing dynamic biomaterials for controlling cellular microenvironments,” Seventh Annual Frontiers at the Chemistry-Biology Interface Symposium, May 2014, Baltimore, MD. *Invited*.
19. MS Rehmann, PM Kharkar, **AM Kloxin**, “Degradable hydrogels for directing mesenchymal stem cell differentiation towards enhanced ligament regeneration,” Society for Biomaterials National Meeting, April 2014, Denver, CO. *Invited*.
20. LA Sawicki, ME Smithmyer, **AM Kloxin**, “Investigating fibrosis progression within dynamic, biomimetic microenvironments,” Pew Scholars Annual Meeting, February 2014, Costa Rica. *Invited*.
21. **AM Kloxin**, “Functional hydrogels as controlled microenvironments for probing and directing cell differentiation and fate,” ACS Fall National Meeting, August 2012, Philadelphia, PA. *Invited*.
22. **AM Kloxin**, “Responsive hydrogels for probing how microenvironment properties influence cell fate,” Polymer Networks, August 2012, Jackson Hole, WY. *Invited*.
23. **AM Kloxin**, “Responsive hydrogels for controlling signals within the microenvironment of progenitor cells,” 33rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2011), August 2011, Boston, MA. *Invited*.

Invited Seminars and Lectures (June 2011-present)

1. **AM Kloxin**, “Designing and utilizing responsive biomaterials in tissue regeneration and disease,” Department of Chemical Engineering, University of Illinois, Urbana-Champaign, October 2018, Champaign, IL.
2. **AM Kloxin**, “Probing breast cancer cell activation in response to microenvironment cues in well-defined synthetic extracellular matrices for insights into late recurrence,” Center for Bioinformatics and Computational Biology, Delaware Biotechnology Institute, University of Delaware, February 2018, Newark, DE.

3. **AM Kloxin**, “Designing and utilizing responsive biomaterials in tissue regeneration and disease,” Department of Biomedical Engineering, Johns Hopkins University, February 2018, Baltimore, MD.
4. **AM Kloxin**, “Designing and utilizing responsive biomaterials for studying and directing regeneration and disease,” School for Engineering of Matter, Transport, and Energy, Arizona State University, November 2017, Tempe, AZ.
5. **AM Kloxin**, “Designing and utilizing responsive biomaterials for studying and directing regeneration and disease,” 3M, November 2017, Minneapolis, MN.
6. **AM Kloxin**, “Designing and utilizing responsive biomaterials to control cellular microenvironments in the study of tissue regeneration and disease,” Department of Chemical Engineering, University of Massachusetts Amherst, September 2017, Amherst, MA. *Invited.*
7. **AM Kloxin**, “Designing and utilizing responsive biomaterials to control cellular microenvironments in the study of tissue regeneration and disease,” Department of Chemical Engineering, University of Virginia, May 2017, Charlottesville, VA. *Invited.*
8. **AM Kloxin**, “Designing and utilizing responsive biomaterials to control cellular microenvironments in the study of tissue regeneration and disease,” Department of Bioengineering, University of Pennsylvania, January 2017, Philadelphia, PA. *Invited.*
9. **AM Kloxin**, “Designing responsive biomaterials for controlling the cell environment,” Department of Chemical Engineering, University of Washington, January 2017, Seattle, WA. *Invited.*
10. **AM Kloxin**, “Designing responsive biomaterials for controlling the cell environment,” Department of Bioengineering, University of Maryland, February 2016, College Park, MD. *Invited.*
11. **AM Kloxin**, “Injectable depots for controlled release of therapeutic proteins,” Merck, October 2015, Lansdale, PA. *Invited.*
12. **AM Kloxin**, “Designing responsive biomaterials for controlling the cell environment,” Department of Materials Science and Engineering, Johns Hopkins University, September 2015, Baltimore, MD. *Invited.*
13. **AM Kloxin**, “Designing responsive materials to control the microenvironment of cancer cells in vitro and in vivo,” Brady Urological Institute, Johns Hopkins University, August 2015, Baltimore, MD. *Invited.*
14. **AM Kloxin**, “Responsive biomaterials for controlling the microenvironment of cells,” College of Engineering, Rowan University, April 2015, Glassboro, NJ. *Invited.*
15. **AM Kloxin**, “Designing responsive biomaterials for controlling the cell environment,” Department of Chemical and Biomolecular Engineering, Colorado State University, February 2015, Fort Collins, CO. *Invited.*
16. **AM Kloxin**, “Materials that mimic biology towards understanding and treating aging & disease and recruiting the next generation of engineers & scientists,” *People, Projects, and Partners* series, University of Delaware, May 2014, Newark, DE. *Invited.*
17. **AM Kloxin**, “Designing dynamic biomaterials for controlling the cell environment,” Department of Chemical Engineering and Materials Science, Stevens Institute of Technology, April 2014, Hoboken, NJ. *Invited.*
18. **AM Kloxin**, “Designing dynamic biomaterials for controlling the cell environment,” HHMI and MARC U*Star Programs, University of Maryland, Baltimore County, March 2014, Baltimore, MD. *Invited.*
19. **AM Kloxin**, “Designing dynamic biomaterials for controlling the cell environment,” Department of Chemical Engineering, University of Michigan, January 2014, Ann Arbor, MI. *Invited.*
20. **AM Kloxin**, “Probing the role of the cell microenvironment in cell fate with responsive materials,” Comprehensive Cancer Center, University of California, Davis, January 2013. *Visiting Scholar BWF.*
21. **AM Kloxin**, “Towards directing regeneration: dynamic biomaterials for controlling the cell microenvironment,” Institute for Regenerative Cures, University of California, Davis, January 2013.

Visiting Scholar BWF.

22. **AM Kloxin**, “Dynamic biomaterials for controlling the cell microenvironment,” Biomedical Engineering, University of California, Davis, January 2013. *Visiting Scholar BWF.*
23. **AM Kloxin**, “Probing the role of the cell microenvironment in cell fate with responsive materials,” Center for Translational Cancer Research, Helen F. Graham Cancer Center at Christiana Care, May 2012, Newark, DE. *Invited.*
24. **AM Kloxin**, “Dynamic Materials for Controlling the Cell Microenvironment,” Chemistry-Biology Interface (CBI), September 2011, Newark, DE. *Invited.*

Other Oral Presentations (June 2011-present)

1. **AM Kloxin**, LA Sawicki, EM Ovadia, “Designer synthetic extracellular matrices for probing breast cancer cell activation in response to microenvironment cues,” National IDeA Symposium of Biomedical Research Excellence, June 2018, Washington, DC. *Contributed.*
2. **AM Hilderbrand**, F Stanzione, J Condon, MA LaRue, A Jayaraman, AM Kloxin, “Understanding the impact of non-natural amino acid incorporation on the assembly of multifunctional collagen mimetic peptides,” American Chemical Society Fall Meeting, August 2017, Washington, DC. *Contributed.*
3. **PJ LeValley**, AM Kloxin, “Responsive hydrogels for tailored release of protein therapeutics,” American Chemical Society (ACS) National Meeting, August 2017, Washington, D.C. *Contributed.*
4. **LA Sawicki**, AM Kloxin, “Tunable Hydrogels to Understand the Role of the Microenvironment in Regulating Breast Cancer Dormancy and Recurrence,” Delaware ACS Student/Industry, April 2017, Newark, DE. *Contributed.*
5. **ME Smithmyer**, JP Spohn, AM Kloxin, “Design of multidimensional culture systems for probing the role of integrin binding in fibroblast activation,” Society for Biomaterials, April 2017, Minneapolis, MN. *Contributed.*
6. **EM Ovadia**, AM Kloxin, “Engineered environments for modulating iPSC function and fate in three-dimensional culture,” ACS Spring National Meeting, April 2017, San Francisco, CA. *Contributed.*
7. **LA Sawicki**, AM Kloxin, "Tunable Hydrogels to Understand the Role of the Microenvironment in Regulating Breast Cancer Dormancy and Recurrence," Distinguished Young Scholars Seminar at University of Washington, August 2016, Seattle, WA. *Invited award lecture.*
8. **LA Sawicki**, AM Kloxin, "Tunable Hydrogels to Understand the Role of the Microenvironment in Regulating Breast Cancer Dormancy and Recurrence," Gordon Research Conference: Signal Transduction by Engineered Extracellular Matrices, June 2016, Biddeford, ME. *Invited.*
9. **ME Smithmyer**, AM Kloxin, "Development of a biomimetic culture model with independently tunable matrix stiffness and integrin binding for studying cell-matrix interactions in lung fibrosis," National IDeA Symposium of Biomedical Research Excellence, June 2016, Washington, D.C. *Contributed.*
10. **ME Smithmyer**, AM Kloxin, “Examining fibroblast response to multiple microenvironment cues in culture models of varying complexity,” World Biomaterials Congress, May 2016, Montreal, Quebec, Canada. *Contributed.*
11. **EM Ovadia**, DW Colby, AM Kloxin, “Controlling differentiation of induced pluripotent stem cells into neurons in well-defined, hydrogel-based microenvironments,” ACS Spring National Meeting, March 2016, San Diego, CA. *Contributed.*
12. **C Guo**, AM Hilderbrand, AM Kloxin, “Mimicking collagenous tissues with dynamically controlled hydrogels through peptide self-assembly and light-mediated click chemistry,” ACS Spring National Meeting, March 2016, San Diego, CA. *Contributed.*
13. **M Rehmman**, AM Kloxin, “Extracellular matrix-mimetic chemical and physical cues for promoting human

mesenchymal stem cell tenogenic gene expression,” ACS Spring National Meeting, March 2016, San Diego, CA. *Contributed*.

14. LA Sawicki, PM Kharkar, MS Rehmann, **AM Kloxin**, “Design of degradable biomaterials for controlling cellular microenvironments in vitro and in vivo,” AIChE Fall National Meeting, November 2015, Salt Lake City, UT. *Contributed*.
15. LA Sawicki, **AM Kloxin**, “Design of thiol–ene hydrogels using facile techniques for studying breast cancer dormancy,” Biomedical Engineering Society, October 2015, Tampa, FL. *Contributed*.
16. **PM Kharkar**, AM Kloxin, KL Kiick, “Reducing-environment sensitive synthetic hydrogels for controlled drug delivery,” ACS Spring National Meeting, March 2015, Denver, CO.
Selected for Excellence in Graduate Polymer Research Symposium.
17. **LA Sawicki**, AM Kloxin, “Tunable Hydrogels to Understand the Role of the Microenvironment in Regulating Breast Cancer Dormancy and Recurrence,” AIChE Fall National Meeting, November 2014, Atlanta, GA. *Contributed*.
18. MS Rehmann, **AM Kloxin**, “Promoting ligamentogenic differentiation of mesenchymal stem cells in controlled microenvironments,” ACS Spring National Meeting, March 2014, Dallas, TX. *Contributed*.
19. **MS Rehmann**, AM Kloxin, “Promoting Ligamentogenic Differentiation of Mesenchymal Stem Cells in Controlled Microenvironments,” AIChE Fall National Meeting, November 2013, San Francisco, CA. *Contributed*.
20. **AM Kloxin**, “Responsive biomaterials for dynamic cell culture and regenerative medicine,” Smart Materials CIMTEC, June 2012, Montecatini Terme, Italy. *Contributed*.
21. **AM Kloxin**, “Responsive hydrogels for probing how microenvironment structure and geometry influence cell phenotype,” Materials Research Society (MRS) Spring National Meeting, April 2012, San Francisco, CA. *Contributed*.
22. **AM Kloxin**, “Synthetic Approaches to Designing Responsive Hydrogels for Dynamic Cell Culture,” American Institute of Chemical Engineers (AIChE) National Meeting, October 2011, Minneapolis, MN. *Contributed*.

Poster Presentations (June 2011-present)

1. EM Ovadia, LA Sawicki, L Pradhan, **AM Kloxin**, “Investigating breast cancer dormancy in response to microenvironment cues with well-defined synthetic extracellular matrices,” San Antonio Breast Cancer Symposium, December 2018, San Antonio, TX.
2. LA Sawicki, EM Ovadia, PJ LeValley, KL Wiley, **AM Kloxin**, “Designing and utilizing synthetic extracellular matrices to probe breast cancer cell activation in response to microenvironment cues,” Engineering Conferences International (ECI) Nanotechnology in Medicine II, June 2018, Albufeira, Portugal.
3. LA Sawicki, EM Ovadia, **AM Kloxin**, “Probing breast cancer cell activation in response to extracellular cues using well-defined synthetic microenvironments,” San Antonio Breast Cancer Symposium, December 2017, San Antonio, TX.
4. **H Ball**, P LeValley, AM Kloxin, “Fabrication of Microfluidic Devices Utilizing Stereolithographic 3D Printing,” American Institute of Chemical Engineering (AIChE) National Meeting, October 2017, Minneapolis, MN.
5. **E Ovadia**, **K Wiley**, A Kloxin, “Visible light photoinitiation of poly(ethylene) glycol hydrogels,” ACS National Meeting, August 2017, Washington, DC.
6. **H Ball**, P LeValley, AM Kloxin, “Fabrication of Microfluidic Devices Utilizing Stereolithographic 3D Printing,” University of Delaware Undergraduate Research and Service Scholar Celebratory Symposium,

August 2017, Newark, DE.

7. **M LaRue**, AM Hilderbrand, AM Kloxin, "Investigating if Amino Acid Position within Collagen Mimetic Peptides Affects Triple Helix Stability," University of Delaware Undergraduate Research and Service Scholar Celebratory Symposium, August 2017, Newark, DE.
8. **O Walker Jr.**, AM Hilderbrand, AM Kloxin "Creating and characterizing artificial collagen gels for comparison to natural collagen," University of Delaware High School Internship Poster Presentation and Program Finale, August 2017, Newark, DE.
9. **E Eastburn**, EM Ford, R Locke, M Killian, AM Kloxin, "Investigating multifunctional collagen-mimetic materials to promote regeneration of musculoskeletal tissues," University of Delaware Undergraduate Research and Service Scholar Celebratory Symposium, August 2017, Newark, DE.
10. **E Ford**, AM Hilderbrand, C Guo, AM Kloxin, "Incorporating hierarchical structure within hydrogel biomaterials using multifunctional collagen mimetic peptides," Center for Biomechanical Engineering Research Biomechanics Research Symposium, May 2017, Newark, DE.
11. **LA Sawicki**, AM Kloxin, "Tunable Hydrogels to Understand the Role of the Microenvironment in Regulating Breast Cancer Dormancy and Recurrence," Delaware ACS Student/Industry, April 2017, Newark, DE. *Contributed.*
12. **M LaRue**, AM Hilderbrand, AM Kloxin, "Mimicking the structure of the extracellular matrix using collagen mimetic peptides," University of Delaware Undergraduate Research and Service Scholar Celebratory Symposium, August 2016, Newark, DE. *Contributed.*
13. **C Mourafetis**, W Chen, AM Kloxin, "Constructing Spatially Organized Hydrogels for Controlled Protein Release," University of Delaware Undergraduate Research and Service Scholar Celebratory Symposium, August 2016, Newark, DE. *Contributed.*
14. **AM Hilderbrand**, AM Kloxin, "Multifunctional biomimetic materials with structural complexity," World Biomaterials Congress, May 2016, Montreal, Quebec, Canada. *Contributed.*
15. **EM Ovidia**, DW Colby, AM Kloxin, "Controlling differentiation of induced pluripotent stem cells into neurons in well-defined, hydrogel-based microenvironments," Delaware IDEAs 2016, February 2016, Newark, DE. *Contributed.*
16. **AM Hilderbrand**, AM Kloxin, "Biomaterials with multiscale structural complexity," Delaware IDEAs 2016, February 2016, Newark, DE. *Contributed.*
17. **C Guo**, **AM Hilderbrand**, AM Kloxin, "Hydrogels with structural complexity provided by multifunctional collagen mimetic peptides," Neutron Day, November 2015, Newark, DE. *Contributed.*
18. **MF Dezendorf**, MS Rehmann, AM Kloxin, "Engineering Strategies for Local Control of Protein Release and Production for Regenerative Medicine Applications," Undergraduate Research and Service Celebratory Symposium, August 2015, Newark, DE. *Contributed.*
19. LA Sawicki, PM Kharkar, **AM Kloxin**, "Responsive biomaterials for controlling cellular microenvironments," GRC Polymers: Inventive Synthesis for Innovative Technologies, June 2015, South Hadley, MA. *Contributed.*
20. **CJ Reeves**, PM Kharkar, AM Kloxin, "Degradable hydrogels for controlled delivery of therapeutics," Undergraduate Research and Service Celebratory Symposium, August 2015, Newark, DE. *Contributed.*
21. **LA Sawicki**, AM Kloxin, "Tunable Hydrogels to Understand the Role of the Microenvironment in Regulating Breast Cancer Dormancy and Recurrence," Annual COBRE Retreat, March 2015, Newark, DE. *Contributed.*
22. **LA Sawicki**, AM Kloxin, "Tunable Hydrogels to Understand the Role of the Microenvironment in Regulating Breast Cancer Dormancy and Recurrence," Northeast Regional IDEa Conference, September 2015, Bar Harbor, ME. *Contributed.*
23. LA Sawicki, C Guo, A Hilderbrand, PM Kharkar, **AM Kloxin**, "Dynamic biomimetic microenvironments

for examining cancer recurrence,” Pew Scholars Annual Meeting, March 2015, Vieques, Puerto Rico. *Invited.*

24. **PM Kharkar**, AM Kloxin, KL Kiick, “Reducing-environment sensitive synthetic hydrogels for controlled drug delivery,” Materials Science and Engineering Open House with ASME, University of Delaware, February 2015, Newark, DE.
25. **MS Rehmann**, AM Kloxin, “Promoting Ligamentogenic Differentiation of Mesenchymal Stem Cells in Controlled Microenvironments,” BMES, October 2014, San Antonio, TX. *Contributed.*
26. **PM Kharkar**, AM Kloxin, KL Kiick, "Reducing-environment sensitive synthetic hydrogels for controlled drug delivery", GRC Drug Carriers in Medicine & Biology, August 2014, Waterville Valley, NH. *Contributed.*
27. **LA Sawicki**, AM Kloxin, “Synthetic microenvironments to understand breast cancer dormancy and recurrence,” GRC Signal Transduction by Engineered Extracellular Matrices, July 2014, Waltham, MA. *Contributed.*
28. **PM Kharkar**, AM Kloxin, KL Kiick, “Glutathione Sensitive Hydrogels For Controlled Drug Delivery,” Society for Biomaterials National Meeting, April 2014, Denver, CO. *Contributed.*
Recognized by Poster Award (2nd place) from Proteins and Cells at Interfaces Special Interest Group
29. **PM Kharkar**, RC Kennel, KL Kiick, AM Kloxin, “Thiol-sensitive Hydrogels For Controlled Drug Delivery,” Materials Science and Engineering Open House with ASME, University of Delaware, February 2014, Newark, DE.
30. **LA Sawicki**, AM Kloxin, “Tunable Hydrogels to Understand the Microenvironment’s Role in Regulating Breast Cancer Dormancy and Recurrence,” MRS Fall National Meeting, December 2013, Boston, MA. *Contributed.*
31. **MS Rehmann**, AM Kloxin, “Promoting Ligamentogenic Differentiation of Mesenchymal Stem Cells in Controlled Microenvironments,” Northeast Regional IDeA Conference, August 2013, Newark, DE. *Contributed.*
32. **LA Sawicki**, AM Kloxin, “Tunable Hydrogels to Understand the Microenvironment’s Role in Regulating Breast Cancer Dormancy and Recurrence,” Northeast Regional IDeA Conference, August 2013, Newark, DE. *Contributed.*
33. **PM Kharkar**, RC Kennel, AM Kloxin, KL Kiick, “Microenvironment-responsive injectable hydrogels for controlled drug delivery,” Northeast Regional IDeA Conference, August 2013, Newark, DE. *Contributed.*
34. **MS Rehmann**, AM Kloxin, “Biochemical Cues for Directing Mesenchymal Stem Cell Function for Ligament Repair,” Mid-Atlantic Chemistry-Biology Interface Symposium, May 2013, College Park, MD.
35. **MS Rehmann**, AM Kloxin, “Biochemical Cues for Directing Mesenchymal Stem Cell Function for Ligament Repair,” University of Delaware Annual Biomechanics Research Symposium, May 2013, Newark, DE.
36. **PM Kharkar**, KL Kiick, AM Kloxin, “Multimode degradable hydrogels for controlled drug delivery,” Materials Science and Engineering Open House with ASME, University of Delaware, February 2013, Newark, DE.
37. **MS Rehmann**, LS Sawicki, E Macedo, **AM Kloxin**, “Dynamic materials for examining the role of the cell microenvironment in cell fate,” Macromolecular Materials Gordon Research Conference, January 2013, Ventura, CA.
38. **MS Rehmann**, AM Kloxin, “Biochemical Cues for Directing Mesenchymal Stem Cell Function for Ligament Repair,” National IDeA Symposium for Biomedical Research Excellence, June 2012, Washington, DC. *Poster.*
Recognized as a Featured Poster in Stem Cells and Tissue Engineering session
39. **MS Rehmann**, AM Kloxin, “Biochemical Cues for Directing Mesenchymal Stem Cell Function for

Ligament Repair,” Mid-Atlantic Chemistry-Biology Interface Symposium, April 2012, Philadelphia, PA.

Oral Presentations (prior to June 2011)

- **AM Kloxin**, MW Tibbitt, LA Sawicki, and KS Anseth “*In situ* property control of step- and chain-growth PEG hydrogels via photolytic degradation,” 32nd Annual Australasian Polymer Symposium, February 2011, Coffs Harbour, New South Wales, Australia. *Contributed*.
- **AM Kloxin**, H Wang, SM Haeger, MW Tibbitt, and KS Anseth “*In situ* manipulation of microenvironment modulus to examine its influence on cell fate,” AIChE National Meeting, November 2010, Salt Lake City, UT. *Contributed*.
- **AM Kloxin**, MW Tibbitt, and KS Anseth “Photodegradable gels for studying the influence of gel structure on cell function,” Macro2010: 43rd IUPAC World Polymer Congress - Polymer Science in the Service of Society, July 2010, Glasgow, Scotland, U.K. *Contributed*.
- **AM Kloxin**, JA Benton, MW Tibbitt, and KS Anseth “Phototunable hydrogels for external manipulation of cell microenvironments,” Pacific Polymer Conference, December 2009, Cairns, Australia. *Contributed*.
- **AM Kloxin**, JA Benton, MW Tibbitt, and KS Anseth “*In situ* control of hydrogel modulus with light to direct cell phenotype,” AIChE National Meeting, November 2009, Nashville, TN. *Contributed*.
- **AM Kloxin**, JA Benton, AL Banaszek, and KS Anseth, “Controlled photolytic degradation of PEG-based hydrogel surfaces to examine the effect of stiffness on valvular interstitial cells,” World Biomaterials Congress, May 2008, Amsterdam, The Netherlands. *Contributed*.
- **AM Kloxin**, AM Kasko, CN Salinas, and KS Anseth, “Photoresponsive PEG-based 3D cell culture platforms,” ACS Spring National Meeting, April 2008, New Orleans, LA. Polymer Chemistry Division Excellence in Graduate Polymer Research Symposium. *Contributed*.
- **AM Kloxin**, AM Kasko, CN Salinas, and KS Anseth, “Photoresponsive PEG-based hydrogels as niches to tailor biochemical cue presentation for tissue engineering applications,” MRS Spring National Meeting, March 2008, San Francisco, CA. *Contributed*.
- **AM Kloxin**, AM Kasko, and KS Anseth, “Controlled photolytic degradation of PEG-based hydrogels to direct cell behavior,” Biomedical Engineering Society (BMES) National Meeting, September 2007, Los Angeles, CA. *Contributed*.

Poster Presentations (prior to June 2011)

- **AM Kloxin**, AM Kasko, and KS Anseth, “Controlled photolytic degradation of PEG-based hydrogels,” 3M IUCRC Photopolymerization Symposium, April 2008, St. Paul, MN.
- **AM Kloxin**, AM Kasko, Jonathan Fairbairn, and KS Anseth, “Controlled photolytic degradation of PEG-based hydrogels: bulk network mass loss, surface patterning, and modeling,” Photopolymerization Fundamentals Conference, June 2007, Breckenridge, CO.
- **AM Kloxin**, AM Kasko, Jonathan Fairbairn, and KS Anseth, “Controlled degradation of photolabile PEG-based hydrogels,” MRS Spring National Meeting, April 2007, San Francisco, CA.

Research support (reverse chronological order)

On-going

1. *Understanding breast cancer dormancy and reactivation to prevent recurrence* (PI Kloxin)
Career Catalyst Research Grant, Susan G. Komen Breast Cancer Foundation (CCR16377327), 7/8/2016-7/7/2019

3. *COBRE: Discovery of Chemical Probes and Therapeutic Lead* (PI Fox; Subproject PI Kloxin)

National Institutes of Health/NIGMS (P20GM104316), 9/1/2014 – 5/31/2019

4. *Investigating fibrosis progression for the identification of new therapeutic targets* (PI Kloxin)
Pew Charitable Trusts (26178), 8/1/2013 – 7/31/2019 NCE

5. *CAREER: Dynamic biomimetic materials with multiscale structural complexity for understanding tissue fibrosis* (PI Kloxin)
National Science Foundation DMR BMAT (1253906), 3/1/2013 – 2/28/2019 NCE

Researchers mentored (reverse chronological order)

Graduate research assistants

Current

1. Kartik Bomb, CBE Ph.D. Student, University of Delaware spring 2019-
(co-advised with Prof. Catherine Fromen)
2. Phillip Taylor, CBE Ph.D. Student, University of Delaware spring 2018-
(co-advised with Prof. Arthi Jayaraman)
Awards: NIH Chemistry-Biology (CBI) Fellow
3. Kimberly Wodzanowski, Chemistry and Biochemistry Ph.D. Student, UD spring 2018-
(co-advised with Prof. Catherine Grimes)
Awards: NIH Chemistry-Biology (CBI) Fellow
4. Samantha Cassel, CBE Ph.D. Student, University of Delaware fall 2017-
5. Adam Faranda, Bioinformatics M.S. Student, University of Delaware summer 2017-
Research: Identifying molecular signatures in breast cancer dormancy and recurrence (co-advised with Prof. Cathy Wu)
6. Eden Ford, CBE Ph.D. Student, University of Delaware fall 2015-
Research: Multifunctional collagen mimetic materials for regeneration of musculoskeletal tissues
Awards: NSF IGERT Fellow in Systems Biology of Cells in Engineered Environments
7. Paige LeValley, CBE Ph.D. Student, University of Delaware fall 2015-
Research: Responsive hydrogel-based particles for controlled therapeutic delivery
Awards: Phillip and Ruth Evans Chemical Engineering Fellowship
8. Katherine Wiley, CBE Ph.D. Student, University of Delaware fall 2014-
Research: Design of dynamic synthetic extracellular matrices for studying cell activation
Awards: NSF IGERT Fellow in Systems Biology of Cells in Engineered Environments
Fraunhofer Exchange Program 2016
9. Amber Hilderbrand, CBE Ph.D. Student, University of Delaware fall 2013-
Research: Design of multifunctional collagen mimetic materials
Awards: Collins Fellowship
Fraser and Shirley Russell Teaching Fellowship

Completed

10. Elisa Ovidia, CBE Ph.D. Student, University of Delaware 2013-2018
Research: Extracellular and intracellular engineering approaches for probing stem cell fate
Awards: ACS BIOT Travel Award
Collins Fellowship
Current: Kite Pharma
11. Megan Smithmyer, CBE Ph.D. Student, University of Delaware 2012- 2018
Dissertation: Investigating fibroblast activation in response to extracellular cues using synthetic hydrogels
Awards: Best Poster, 8th Annual Frontiers at the Chemistry-Biology Interface Symposium
Current: Boehringer Ingelheim

12. Lisa Sawicki, CBE Ph.D. Student, University of Delaware 2011- 2017
Dissertation: Design and characterization of tunable hydrogels to examine microenvironmental regulation of breast cancer recurrence
Awards: Distinguished Young Scholars Seminar at University of Washington 2016
 Outstanding Poster at GRC Signal Transduction in Engineered Extracellular Matrices 2016
 Milliken Graduate Research Symposium 2016
 NSF IGERT Fellow in Systems Biology of Cells in Engineered Environments
 UD Graduate Fellow (declined due to timing overlap with IGERT)
 Schipper Fellowship
Current: Boehringer Ingelheim
13. Matthew Rehmann, CBE Ph.D. Student, NIH CBI Fellow, University of Delaware 2011-2016
Dissertation: Engineering synthetic hydrogels for directing adult stem cell function for ligament repair
Awards: NIH Chemistry-Biology (CBI) Fellow
 Saurabh A. Palkar Graduate Award for Mentoring from the UD College of Engineering
Current: Bristol-Myers Squibb
14. Prathamesh Kharkar, MSE Ph.D. Student, University of Delaware 2011-2016
Dissertation: Design of multimodal degradable hydrogels for controlled therapeutic delivery (co-advised with Prof. Kristi Kiick)
Awards: Excellence in Graduate Polymer Research, ACS POLY Spring 2015
 Poster Award (2nd place), SFB 2014 Proteins and Cells at Interfaces SIG
 Outstanding Graduate Student Service Award from MSE Department
Featured on LabTV (<https://www.youtube.com/watch?v=uAETtEr187k>)
Current: Acelity Inc.

Postdoctoral scholars

Current

1. Dr. Lina Pradhan, Post-doctoral Research Associate, University of Delaware 2017-

Completed

2. Dr. Raghupathi Neelarapu, Post-doctoral Research Associate, University of Delaware 2018
Current: Adesis
3. Dr. Srimoyee Dasgupta, Post-doctoral Research Associate, University of Delaware 2017-2018
Current: Adesis
4. Dr. Lisa Sawicki, Post-doctoral Research Associate, University of Delaware spring 2017
Current: Boehringer Ingelheim
5. Dr. Chen Guo, Post-doctoral Research Associate, University of Delaware 2014-2016
Awards: Outstanding Presentation Award from “Dynamic and Tunable Biomaterials Symposium” in the ACS PMSE national meeting spring 2016

Visiting scholars

Completed

1. Phillip Taylor, NIH CBI Research Rotation, Chemistry Ph.D. Student spring 2018
2. Katherine Nelson, NIH CBI Research Rotation, Chemistry Ph.D. Student spring 2018
3. Kimberly Wodzanowski, NIH CBI Research Rotation, Chemistry Ph.D. Student winter 2018
4. Laura Macdougall, University of Warwick, Chemistry Ph.D. Student fall 2017
Award: Researcher Mobility Grant, Royal Society of Chemistry
5. Brielle Hayward-Piatkovskiy, NIH CBI Research Rotation, Biology Ph.D. Student fall 2017
6. Orlando Walker, K-12 Engineering High School Intern summer 2017

7. Andrew Gaynor, NIH CBI Research Rotation, CHEG Ph.D. Student winter 2015
8. Carolyn Hartwig, Fraunhofer Visiting Scholar, M.S. student Dresden University summer 2013
Project: "Directing stem cell differentiation with biomimetic materials"
9. Bansri Patel, High School Researcher, BioGENEius Program 2012
Awards: Gold Medal in 10th Grade Fair, 1st Place Medicine & Health Category; 1st Place Philadelphia Drug Exchange Award; and DE BioGENEius Challenge Honorable Mention
Current: University of Pittsburgh Guaranteed Admission Program in Medicine

Undergraduate research assistants

Current

1. Christopher Calo, Undergraduate Research Assistant, University of Delaware 2017-
Awards: 2nd Place Materials Engineering and Sciences Poster Session at AIChE 2018
REU University of Colorado, Boulder, Summer 2018
2. Rebecca Huber, Undergraduate Research Assistant, University of Delaware 2017-
Awards: REU Colorado State University Summer 2017
NSF IRES Program Summer 2018

Completed

3. Emily Eastburn, REU, University of Delaware summer 2017, 2018
4. Harrison Ball, Undergraduate Research Assistant, University of Delaware 2017-2018
Awards: UD Undergraduate Research Program Summer Fellow 2017
Current: Chemical Engineering, University of Michigan
5. Mark LaRue, Undergraduate Research Assistant, University of Delaware 2016-2018
Awards: UD Undergraduate Research Program Summer Fellow 2016 and 2017
Current: Eurofins Lancaster Laboratories at Merck & Co.
6. Joseph Spohn, Undergraduate Research Assistant, University of Delaware 2016-2017
Awards: UD Undergraduate Research Program Summer Fellow 2016
Current: Eurofins Lancaster Laboratories at Merck & Co.
7. Christopher Bresette, Undergraduate Research Assistant, University of Delaware 2015-2017
Senior Thesis: Incorporating cyclic peptides into hydrogel-based cell culture models
Awards: UD Undergraduate Research Program Summer Fellow 2015
Current: Biomedical Engineering, Georgia Institute of Technology
8. Christine Mourafetis, NSF REU, University of Delaware summer 2016
9. Mingrui Yang, Undergraduate Research Assistant, University of Delaware 2015-2016
10. Cody Reeves, Undergraduate Research Assistant, University of Delaware 2014-2016
Awards: UD Undergraduate Research Program Summer Scholar 2015
UD Undergraduate Research Program Summer Fellow 2014
Current: University of Virginia Law School
11. Morgan Dezendorf, Undergraduate Research Assistant, University of Delaware 2015
Awards: UD Undergraduate Research Program Summer Scholar 2015
12. Elaine Stewart, Undergraduate Research Assistant, University of Delaware 2015
Awards: NASA Intern 2015, Kennedy Space Center
13. Rachel Kennel, Undergraduate Research Assistant, University of Delaware 2013-2015
Awards: UD Research Foundation Summer Scholar
Current: DeNovix
14. Haoze Yang, Undergraduate Research Assistant, University of Delaware summer 2014
15. William Balance, Undergraduate Research Assistant, University of Delaware 2013-2014
Awards: UD HHMI Summer Scholar
Current: Chemical and Biomolecular Engineering, University of Illinois, Urbana-Champaign
16. Kelsi Skeens, Undergraduate Research Assistant, University of Delaware 2013-2014

Senior Research: Examining structure-property relationships in tunable hydrogels towards improved mesh size determination

Awards: Fraser and Shirley Russell Summer Scholar

Current: Chemical Engineering, University of Massachusetts, Amherst

17. Michael Dummeldinger, Undergraduate Research Assistant, University of Delaware 2013-2014

Senior Thesis: Synthesis and characterization of collagen-mimicking hydrogels to examine lung fibrosis

Awards: Donald W. Harward Fellows Award

UD Undergraduate Research Program Summer Scholar

Current: Bristol-Myers Squibb

18. Bhavin Gala, Undergraduate Assistant, University of Delaware 2013

19. Eric Macedo, Undergraduate Research Assistant, University of Delaware 2011-2013

Senior Research: Probing the Role of Alignment in the Differentiation of hMSCs into Ligament Fibroblasts

Awards: UD HHMI Summer Scholar

Current: CB&I

20. Andrew Garibian, Undergraduate Research Assistant, University of Delaware 2012

Current: Brakchem America

Thesis committees of students at the University of Delaware (Graduate)

1. Daniel Yur, Ph.D. candidate in Chemical and Biomolecular Engineering, incoming class 2017
2. Douglas Nmagu, Ph.D. candidate in Chemical and Biomolecular Engineering, 2017
3. Josh Condon, Ph.D. candidate in Chemical and Biomolecular Engineering, 2016
4. Rachel Lieser, Ph.D. candidate in Chemical and Biomolecular Engineering, 2016
5. Olivia George, Ph.D. candidate in Materials Science and Engineering, 2015
6. John Ruano Salguero, Ph.D. candidate in Chemical and Biomolecular Engineering, 2015
7. Lauren Dorsey, M.S. candidate in Chemical and Biomolecular Engineering, 2015
8. Nicole Flynn, Ph.D. candidate in Biological Sciences, 2015
9. Nairita Sinha, Ph.D. candidate in Materials Science and Engineering, 2015
10. Bassil El Zaatari, Ph.D. candidate in Chemical and Biomolecular Engineering, 2014
11. Chen Yuan Kao, Ph.D. candidate in Chemical and Biomolecular Engineering, 2014
12. Stephanie Yeager, M.S. candidate in Biological Sciences, 2014
13. Chad Greco, Ph.D. candidate in Chemical and Biomolecular Engineering, 2013
14. Jen Niemczyk Mantle, Ph.D. candidate in Chemical and Biomolecular Engineering, 2013
15. Megan Smithmyer, Ph.D. candidate in Chemical and Biomolecular Engineering, 2013
16. Daniel Cook, Ph.D. candidate in Chemical and Biomolecular Engineering, 2012
17. Jingsi Gao, Ph.D. candidate in Chemical and Biomolecular Engineering, 2012
18. Kevin Dicker, Ph.D. candidate in Materials Science and Engineering, 2012
19. Ching-Wen (Sandy) Hou, Ph.D. candidate in Chemistry and Biochemistry, 2012
20. Celia Foster, Ph.D. candidate in Chemistry and Biochemistry, 2012
21. Melissa Gordon, Ph.D. candidate in Chemical and Biomolecular Engineering, 2012
22. Morgan Urello, Ph.D. candidate in Chemical and Biomolecular Engineering, 2012
23. Qi Chen, Ph.D. candidate in Chemical and Biomolecular Engineering, 2012
24. Scott Horton, Ph.D. candidate in Chemical and Biomolecular Engineering, 2012
25. Stephanie Luff, Ph.D. candidate in Biological Sciences, 2012
26. Stephen Ma, Ph.D. candidate in Chemical and Biomolecular Engineering, 2012
27. Daniel Blackstock, Ph.D. candidate in Chemical and Biomolecular Engineering, 2011
28. Heejae Kim, Ph.D. candidate in Chemical and Biomolecular Engineering, 2011
29. Kyle McHugh, Ph.D. candidate in Chemical and Biomolecular Engineering, 2011

Thesis committees of students at the University of Delaware (Undergraduate)

1. Jon Galarraga, Senior Thesis, Graduating class of 2016
2. Benjamin Carberry, Senior Thesis, 2016

3. Sarah Doggett, Senior Thesis, 2016
4. Monideepa Chatterjee, Senior Thesis, 2016
5. Charles McCutcheon, Senior Thesis, 2016

Teaching

Courses instructed ([number enrolled])

University of Delaware, Newark, DE

- CHEG332 [80] Chemical Engineering Kinetics (co-taught with Raul Lobo) (core) Fall 2018
- CHEG867-013 [12] Experimental Methods in Biomolecular Engineering (elective) Spring 2018
- CHEG332 [90] Chemical Engineering Kinetics (co-taught with Raul Lobo) (core) Fall 2017
- CHEG342 [89] Heat and Mass Transfer (co-taught with Millicent Sullivan) (core) Spring 2017
- CHEG432 [15] Chemical Engineering Design (co-advised with Matt Decker) (core) Spring 2016
- CHEG600/MSEG630 [44] Introduction to Polymer Science and Engineering (co-taught with Arthi Jayaraman) (elective) Fall 2015
- CHEG342 [92] Heat and Mass Transfer (co-taught with Wilfred Chen) (core) Spring 2015
- CHEG600/MSEG630 [40] Introduction to Polymer Science and Engineering (co-taught with Arthi Jayaraman) (elective) Fall 2014
- CHEG342 [91] Heat and Mass Transfer (core) Spring 2014
- CHEG342 [80] Heat and Mass Transfer (co-taught with Maciek Antoniewicz) (core) Spring 2013
- CHEG600/MSEG630 [31] Introduction to Polymer Science and Engineering (elect.) Fall 2012
- CHEG600/MSEG630 [24] Introduction to Polymer Science and Engineering (co-taught with Thomas Epps) (elective) Fall 2011

University of Colorado, Boulder, CO

- GEEN1400 [30] First-Year Engineering Projects (co-taught with Kristi Anseth) (core) Fall 2009

Guest lectures

- NSF SBE2 IGERT Course (elective) 2013-2017
- MEEG 484 Biomaterial and Tissue Engineering (elective) 2012

Community outreach

- *Mimicking Nature* kiosk, Partnership with Delaware Museum of Natural History 2015-2016, 2019
sites.udel.edu/biomimicry
- Panelist, Future Faculty Workshop, University of Delaware 2018
 - <https://www.udel.edu/udaily/2018/august/thomas-epps-lashonda-korley-host-future-faculty-workshop/>
 - <http://www.engr.udel.edu/news/2018/08/developing-diverse-leaders/>
- Community outreach activities of research group include
 - Tutoring of middle school students (math at Serviam Girls Academy in New Castle, DE, through UD Women in Engineering; math at Shue-Medill Middle School in Newark, DE, through Colburn Club Outreach Group)
 - Science demonstrations (Shue-Medill Middle School in Newark, DE, through Colburn Club Outreach Group)
 - Student-led Founding of and Mentoring in “Empathetic Peers Offering Wisdom Encouragement and Resources (EmPOWER) Program” in UD Department of Chemical & Biomolecular Engineering
- Engagement with the popular press

- <https://www.usatoday.com/story/news/nation-now/2016/10/13/advocates-funding-lifts-breast-cancer-survival-rates/91984034/>
- http://www.wdel.com/news/video-university-of-delaware-researcher-hopes-to-find-a-way/article_526223f9-7294-5ef7-8996-28ef865775a6.html
- *UD Rise and Science* WVUD 91.3 FM weekly radio show 2016-
UDRiseAndScience.com, Faculty advisor
- *Biomimicry* summer camp module summer camp module, Summer 2016
Partnership with UD K-12 Engineering
- *Family Friday* event, Partnership with UD K-12 Engineering March 2016
Program, Friday dinner and Saturday lunch event with hands-on learning activities
- *Hacking Biology* summer camp module, Partnership with UD College of Engineering Summer 2015
K-12 Outreach Program
- Presenter, UD on the Hill March 2015
- Panelist, UD New Faculty Orientation February 2015
- Panelist, AIChE Women’s Initiative Committee Assistant Professor Career Panel Fall 2014
- Presenter, UD Women in Engineering “Meet Your Faculty Lunch” Fall 2014
- Panelist, Alpha Omega Epsilon High School Visitation Day Spring 2014
- Student-led weekly science-themed radio program *Science Rocks!* 2014-2017
- Faculty Host for the High School Weekday Visit Program College of Engineering Spring 2013
- Faculty Representative, UD Decision Days Spring 2013
- Lecturer, UD Governor’s School Summer 2012
- “What is Engineering” video, presented at Blue Rocks Science Day (3,000 students) Spring 2012
- UD Halloweengineering – Engineering discovery for K-12 students & parents Fall 2011
- Faculty Representative, University of Delaware Discovery Days 2011, 2012

Professional Service

Conference organization

1. BioFrontiers Symposium, Regenerative BioX, Working Group Leader Summer 2018
2. Engineering Conferences International (ECI) in Medicine, Session Chair Summer 2018
3. ACS BIOT Area Coordinator “Biomedical and Emerging Technologies” Symposium Spring 2018
4. ACS PMSE Session Presider in “Dynamic Chemistry in Polymer Materials” Symposium Fall 2017
5. 10th Annual Frontiers in Chemistry and Biology Interface Symposium, Co-organizer 2017
6. AIChE Division 8B Biomaterials, Chair 2016-2017
7. AIChE Division 8B Biomaterials, Co-Chair 2015-2016
8. Pew Scholars Annual Meeting 2016 Co-organizer 2015-2016
9. ACS POLY Symposium Co-organizer “Tunable and Dynamic Biomaterials” Spring 2016
Co-sponsored by SFB
10. AIChE Session Co-organizer “Biomaterials for in Vitro Tissue Models” Fall 2015
11. GRC Discussion Leader “Polymers: Inventive Synthesis for Innovative Technologies” June 2015
12. SFB Symposium Co-organizer “Advanced Hydrogels with Hierarchical Structures Spring 2015
for Biological Applications”
13. ACS BIOT Area Coordinator “Emerging Technologies” Symposium Spring 2015
14. AIChE Session Co-organizer “Biomaterials: Future Faculty” Fall 2014
15. SFB Symposium Co-organizer and Moderator “Biomaterials in the 4th Dimension Spring 2014
- Controlling Temporal Properties”
16. ACS Session Organizer and Moderator “Emerging Technologies in Stem Cells Spring 2014
and Tissue Engineering”
17. AIChE Session Organizer “Biomimetic Materials I&II” and “Biomaterials: Future Faculty” Fall 2013
18. MRS Symposium Organizer “Synthetic tools for understanding biological phenomena” Fall 2013

*Funded by NSF, 3M, Biomaterials Science, Journal of Visual Experiments,
University of Rochester, IUPUI, and University of Delaware*

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| 19. ACS Symposium Organizer “Bottom-up design of the next generation of biomaterials”
<i>Funded by NSF, Aldrich Materials Science, TOSOH BIOSCIENCE, ACS POLY</i> | Spring 2013 |
| 20. GRC Discussion Leader “Macromolecular Materials” | January 2013 |
| 21. AIChE Session Organizer “Hydrogel Biomaterials” and “Spatially Patterned Biomaterials” | Fall 2012 |
| 22. ACS PMSE Session Presider “Polymeric Biomaterials” | August 2012 |
| 23. Polymer Networks 2012 Conference Co-organizer and Session Presider | August 2012 |
| 24. AIChE Session Co-organizer “Challenges in Biomaterials Synthesis” | Fall 2011 |

Review panels

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|---|-------|
| ▪ NIH, ad hoc study section member | 2018- |
| ▪ UD Research Office, ad hoc reviewer | 2014- |
| ▪ NSF panels, ad hoc panel member and ad hoc reviewer | 2013- |

Journal boards

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|---|-----------|
| ▪ Editorial Advisory Board, <i>Biomacromolecules</i> | 2019- |
| ▪ Editorial Advisory Board, <i>ACS Macro Letters</i> | 2018- |
| ▪ Editorial Advisory Board, <i>ACS Biomaterials Science & Engineering</i> | 2014- |
| ▪ Peer Review Board member, <i>Journal of Visualized Experiments (JoVE)</i> | 2011-2014 |

Peer reviewer (>50 journals) including

Nature Communications, Science Advances, ACS Biomaterials Science and Engineering, ACS Macro Letters, Acta Biomaterialia, Advanced Functional Materials, Advanced Materials, Advanced Healthcare Materials, Angewandte Chemie, Biomacromolecules, Biomaterials, Biomaterials Science, Journal of Materials Chemistry B, Journal of Polymer Science – Polymer Chemistry, Journal of the American Chemical Society, Journal of Biomedical Materials Research, Journal of Visual Experiments, Langmuir, Macromolecular Rapid Communications, Macromolecules, Osteoarthritis and Cartilage, PLoS ONE, Polymer, Polymer Chemistry, RSC Advances, Soft Matter, Tissue Engineering

University of Delaware

University level

- | | |
|---|------------|
| ▪ Associate Director of the Advisory Committee, UD CBI Program | 2018- |
| ▪ UD University Biosafety Committee | 2017- |
| ▪ Internal Steering Committee,
UD COBRE Molecular Design of Advanced Biomaterials | 2014- |
| ▪ Chemistry & Biochemistry Faculty Search Committee,
UD COBRE Discovery of New Chemical Probes and Therapeutic Targets | 2014-2015 |
| ▪ Ad hoc member of UD Biomedical Engineering Faculty Search Committee | 2014 |
| ▪ Summer Scholars Selection Committee | 2012, 2013 |

College level

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| ▪ Participant, Annual Retreat, UD College of Engineering | 2019 |
| ▪ Faculty Secretary, UD College of Engineering | 2014-2016 |
| ▪ Dean’s Search Committee, UD College of Engineering | 2012-2013 |

Department level

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|--|-----------|
| ▪ Graduate Admissions, Chemical & Biomolecular Engineering | 2019- |
| ▪ Materials Science & Engineering Faculty Search Committee | 2018-2019 |
| ▪ Undergraduate Studies Committee, Chemical & Biomolecular Engineering | 2017- |
| ▪ Academic advisor (~ 60 undergraduate students in total) | 2011- |

- Chemical and Biomolecular Engineering Faculty Search Committee 2017-2018
- Seminar Co-coordinator, UD Chemical & Biomolecular Engineering 2015-17
- Seminar Coordinator, UD Chemical & Biomolecular Engineering 2012-13