

Anshu Agarwal, Ph.D.

Associate | Biomedical Engineering and Sciences
Philadelphia
+1-215-594-8852 | aagarwal@exponent.com

Professional Profile

Dr. Anshu Agarwal is a materials scientist at Exponent specializing in the synthesis and characterization of polymers for biomedical applications with an emphasis on the analysis of structure-property relationships. Her interdisciplinary background has given her expertise in analyzing the performance of polymers and biomaterials in a variety of applications, including drug delivery systems, implants, gels, and material degradation.

Dr. Agarwal has extensive experience with a wide range of materials characterization techniques, including spectroscopy (NMR, FTIR, UV-Vis), mass spectrometry (MALDI-TOF), light scattering (DLS), size exclusion chromatography (SEC/GPC), thermal characterization (DSC, TGA), mechanical characterization (tensile, DMA, rheology), and optical microscopy. Additionally, she is experienced with *in vitro* (cell culture) and *in vivo* (behavioral analysis, histology) characterization of polymeric biomaterials.

Prior to joining Exponent, Dr. Agarwal completed her Ph. D. in Mechanical Engineering & Materials Science at Duke University, where her doctoral research focused on the design, synthesis, and development of resorbable, thermally responsive polyesters for injectable and implantable drug delivery applications. This work included small molecule and polymer synthesis and characterization, micro/nanoparticle formulation, additive manufacturing, and in-depth characterization of polymer solution dynamics. She also worked at Align Technology as an R&D Engineer in biomechanics and additive manufacturing, where she supported product development, biomechanical testing, and clinical compatibility analysis.

Academic Credentials & Professional Honors

Ph.D., Mechanical Engineering and Materials Science, Duke University, 2026

M.S., Materials Science and Engineering, University of California, Berkeley, 2020

B.S., Bioengineering, Materials Science, Engineering, University of California, Berkeley, 2019

Prior Experience

Graduate Student Researcher - Becker Lab for Functional Biomaterials, Duke University, 2021-2026

R&D Engineer II - Biomechanics & Additive Manufacturing, Align Technology, 2020-2021

Graduate Student Researcher - Gu Research Group, University of California, Berkeley, 2019-2020

Product Development Engineering Intern, Nanomix, 2019

Research Assistant - Liepmann Microfluidics Laboratory, University of California, Berkeley, 2017-2019

Research Intern, Novozymes, 2018

Research Assistant – Abate Lab, University of California, San Francisco, 2017

Research Assistant, University of Colorado Anschutz Department of Ophthalmology, 2016

Professional Affiliations

American Chemical Society, Member

Phi Sigma Rho, Member

Publications

Dziewior CS, Li Y, Song S, Agarwal A, Coaker K, Judge NG, Ji RR, Becker ML. [Additive accelerated meloxicam release from poly \(ester urea\) fiber implants for pain management](#). Advanced Healthcare Materials 2026; 14(8):e03699.

McDonald SM, Bu Y, Dreger NZ, Messmore B, McFarland G, Agarwal A, Yager KG, Tsai E, Becker ML. [Stereochemical control of water transport properties in Thiol-yne polymers](#). Advanced Materials 2025; 37(42):e08392.

Agarwal A, Bobay BG, Becker ML. [Observation of dynamic aggregation behavior in thermoresponsive micro- and nanoparticles via diffusion-ordered NMR spectroscopy](#). Journal of the American Chemical Society 2025; 147(11):9386–9395.

Stinson NC, Matsuoka Y, Agarwal A, Dziewior CS, McDonald SM, Li Y, Godwin K, Ji RR, Becker ML. [Pre-clinical assessment of bupivacaine-loaded poly \(ester urea\) thin films for controlled drug release and effective pain management after surgery](#). Advanced Healthcare Materials 2025; 14(3):2402800.

Presentations

Agarwal A, Bobay BG, Becker ML. Observation of dynamic aggregation behavior in thermoresponsive micro- and nanoparticles via diffusion-ordered NMR spectroscopy. Triangle Student Research Competition, Research Triangle Park, NC, 2025.

Agarwal A, Bobay BG, Becker ML. Observation of dynamic aggregation behavior in thermoresponsive micro- and nanoparticles via diffusion-ordered NMR spectroscopy. BASF - Duke Research Day, Durham, NC, 2025.

Agarwal A, Bobay BG, Becker ML. Observation of dynamic aggregation behavior in thermoresponsive micro- and nanoparticles via diffusion-ordered NMR spectroscopy. Oral Presentation, Duke Mechanical Engineering & Materials Science Research Symposium, Durham, NC, 2025.

Agarwal A, Bobay BG, Becker ML. Determination of aggregation number in thermoresponsive particles via diffusion-ordered NMR spectroscopy. Oral Presentation, American Chemical Society, Denver, CO, 2024.

Agarwal A, Bobay BG, Becker ML. Degradable, temperature-responsive polymers as a versatile drug delivery platform. Poster Presentation, Duke Soft Matter Conference, Durham, NC, 2024.

Agarwal A, Bobay BG, Becker ML. Degradable, temperature-responsive polymers as a versatile drug delivery platform. Poster Presentation, Duke Center for Biomolecular and Tissue Engineering

Symposium, Durham, NC, 2024.

Agarwal A, Becker ML. Degradable, temperature-responsive polymers for drug delivery. Poster Presentation, Duke Mechanical Engineering & Materials Science Research Symposium, Durham, NC, 2024.

Agarwal A, Becker ML. Degradable, temperature-responsive polymers for drug delivery. Poster Presentation, Duke Mechanical Engineering & Materials Science Research Symposium, Durham, NC, 2024.

Agarwal A, Becker ML. Degradable, temperature-responsive polymers for drug delivery. Poster Presentation, Duke Materials Initiative Spring Retreat, Durham, NC, 2024.