Exponent®
Engineering & Scientific Consulting

Kelly Bukovic, Ph.D.

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Professional Profile

Kelly Bukovic, Ph.D., is a chemical engineering and polymer scientist specializing in the design, synthesis, and characterization of advanced polymeric materials. She leverages her multidisciplinary background in polymer chemistry, chemical engineering, and biomolecular engineering to consult on projects addressing complex technical challenges involving responsive polymeric materials, coatings, biomaterials and drug delivery.

Dr. Bukovic has expertise in reversible addition-fragmentation chain transfer (RAFT) polymerization, including the design and synthesis of low dispersity, surface-attachable polymers with controlled functionality. She also has experience evaluating the stability and performance of glass coatings in aqueous environments, providing insight into coating durability, interfacial behavior, and material degradation. She has extensive experience in polymer and materials characterization techniques including nuclear magnetic resonance (NMR) spectroscopy, Fourier transform infrared (FTIR) spectroscopy, gel permeation chromatography (GPC), and contact angle goniometry (surface wettability). Her background is particularly applicable to polymer and biomaterial failure analysis, including investigations into material-related causes of performance issues and the stability and degradation of polymeric coatings.

Before joining Exponent, Dr. Bukovic earned her Ph.D. in Chemical Engineering from the University of Virginia. Her doctoral research explored the structure-property relationships connecting thermoresponsive polymer design with stability and surface wettability. She also investigated the reversible complexation of therapeutic peptides for controlled drug delivery and hydrogel crosslinking strategies for applications in regenerative medicine.

Academic Credentials & Professional Honors

Ph.D., Chemical Engineering, University of Virginia, 2026

B.S., Chemical Engineering, University of Florida, 2020

Dean’s Scholar Fellowship, University of Virginia School of Engineering & Applied Science, 2020-2022

University Scholars Fellowship, University of Florida, 2019

Publications

Alimadad M, Go JL, Mosby HP, Gourishankar AS, **Bukovic KM**, Letteri RA. Lecture-compatible lab session and associated homework assignments to provide hands-on experience with design, set-up, and analysis of raft polymerizations. J Chem Ed. 2026; in revision.

Bukovic KM, Caliari SR, Letteri RA. Engineering thermoresponsive biointerfaces using graft-to strategies: connecting polymer architecture to temperature-dependent surface wettability. Macromolecules 2026; 59(13):7972–7980.

Gourishankar AS, Bannon MS, **Bukovic KM**, Ashcraft E, Pfitzer LM, Letteri RA. Reversible, polymeric complexation of therapeutic peptides using esterification. ACS Macro Lett. 2026; 15(4):611–617.

Presentations

Bukovic KM, Caliari SR, Letteri RA. Engineering thermoresponsive biointerfaces using graft-to strategies: connecting conjugation strategy to surface wettability. Oral presentation, American Institute of Chemical Engineers (AIChE) Annual Meeting, Boston, MA, 2025.

Bukovic KM, Liskey S, Caliari SR, Letteri RA. Engineering thermoresponsive biointerfaces: the role of polymer grafting architecture on surface wettability. Poster presentation, Society for Biomaterials (SFB) Southeast Regional Symposium, Atlanta, GA, 2024.

Bukovic KM, Caliari SR, Letteri RA. RAFT Polymerization and immunocytochemistry cell culture studies for thermoresponsive biomaterial design. Poster presentation, Mid-Atlantic Advanced Biomanufacturing Symposium, Charlottesville, VA, 2021.

Project Experience

In her graduate work, Kelly has led a research project and published a first author paper on the development of thermoresponsive-polymer based glass coatings with tunable temperature-dependent wettability for enzyme-free cell sheet harvest. She developed strategies for stabilizing aminosilane-based glass coatings in aqueous, physiologically relevant environments. Dr. Bukovic also engineered a series of surface-attachable thermoresponsive polymers using RAFT polymerization. She designed and synthesized low dispersity anionic polymers capable of complexing with therapeutic peptides for controlled drug release.