



Birck Nanotechnology Center

Building bone with polymers– How new materials and additive manufacturing are changing medicine

Matthew L. Becker

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2:00pm – 3:00pm, BRK 1001

Bio: Matthew L. Becker is the W. Gerald Austen Endowed Chair of Polymer Science and Engineering at The University of Akron. He holds appointments in the Departments of Polymer Science, Integrated Bioscience and Biomedical Engineering. His multidisciplinary research team is focused on developing bioactive polymers for regenerative medicine and addressing unmet medical needs at the interface of chemistry, materials and medicine. His group has published more than 130 papers, has 30 patents issued or pending and is the founder of three start-up companies.

Professor Becker was awarded the Macromolecules-Biomacromolecules Young Investigator Award in 2015. He is a Kavli Fellow and a Fellow of the Royal Society of Chemistry, the PMSE Division of the American Chemical Society and the American Institute for Medical and Biological Engineering. Dr. Becker earned a PhD in organic chemistry at Washington University in St. Louis as an NIH Chemistry Biology Interface Training Fellow. In 2003, he moved to the Polymers Division of the National Institute of Standards and Technology for a National Research Council Postdoctoral Fellowship. He joined the permanent staff as a project leader in 2005 before moving to The University of Akron in 2009.

Abstract: Recent synthetic advances have enabled the synthesis of polymers designed to elicit specific cellular functions and to direct cell-cell interactions. Motivated by traumatic injuries experienced by warfighters, we are developing novel materials and devices designed to repair segmental bone defect and achieve limb salvage. Biomimetic approaches based on polymers derivatized with adhesive receptor-binding peptides, glycoproteins and tethered growth factors have been shown to enhance interactions at the biotic-synthetic interface. Further advances in both synthetic methodology and additive manufacturing are needed to drive these efforts forward. This presentation will describe the use of several translationally relevant chemistries and functionalization strategies that are impacting the practice of medicine and how physicians are planning for future therapies using additive manufacturing that were not possible previously.