Materials Chemistry Seminar

Friday, April 19, 2024
11:30 a.m. ~ BRWN 4102

"Resorbable Barrier Materials for Flexible Electronics and Medical Devices"

Matthew L. Becker

Hugo L. Blomquist Distinguished Professor
Duke University

BIO: Matthew L. Becker is the Hugo L. Blomquist Distinguished Professor of Chemistry, Mechanical Engineering & Material Science, Biomedical Engineering and Orthopaedic Surgery at Duke University. His multidisciplinary research team is focused on developing bioactive polymers which address unmet medical needs at the interface of chemistry, materials and medicine. He is a Kavli Fellow and a Fellow of the National Academy of Inventors, the Royal Society of Chemistry, the American Institute of Medical and Biomedical Engineering and the American Chemical Society. From 2009-2019 he was the W. Gerald Austen Endowed Chair of Polymer Science and Engineering at The University of Akron. He earned a Ph.D. in organic chemistry from Washington University in St. Louis (2003) as an NIH Chemistry Biology Interface Training Fellow. From 2003-2005, he was a NRC Postdoctoral Fellow in the Polymers Division of the National Institute of Standards and Technology and remained on the permanent staff until 2009 as a project leader for bioimaging and tissue engineering.

Abstract:

Resorbable, implantable bioelectronic devices are emerging as powerful tools to reliably monitor critical physiological parameters in real time over extended periods. While degradable magnesium-based electronics have pioneered this effort, relatively short functional lifetimes have slowed clinical translation. Barrier films that are both flexible and resorbable over predictable timelines would enable tunability in device lifetime and expand the viability of these devices. Herein, we present a library of stereocontrolled succinate-based copolyesters which leverage copolymer composition and processing method to afford tunability over thermomechanical, crystalline, and barrier properties. One copolymer composition within this library has extended the functional lifetime of transient bioelectronic prototypes over existing systems by several weeks–representing a considerable step towards translational devices

Reference Articles:

https://doi.org/10.1016/j.biomaterials.2022.121940
https://doi.org/10.1038/s41467-023-42775-5

PURDUE UNIVERSITY | Department of Chemistry