THE OHIO STATE UNIVERSITY

The William G. Lowrie Department of Chemical and Biomolecular Engineering Graduate Program Cordially invites you to attend a seminar on

Designing Biomaterials to take advantage of the cellular red/ox systems

Thomas Dziubla

Professor and Chair
Department of Chemical and Materials Engineering
University of Kentucky

Thursday, January 25th, 11:30 AM
130 Koffolt Lab, CBEC 151 W Woodruff Ave
Reception at 11:00 AM - CBEC Lobby

Bio

Dr. Thomas Dziubla, Ph.D. is Professor of Chemical Engineering and the Chair of the Department of Chemical and Materials Engineering at the University of Kentucky. He received his B.S. in Chemical Engineering from Purdue University (1998) and Ph.D. in Chemical Engineering from Drexel University (2002). His research group is interested in the design of new functional polymeric biomaterials for improved biomaterial integration and wound healing. In 2019, he was inducted into the American Institute for Medical and Biological Engineering College of Fellows. He holds 16 patents, has authored over 100 peer reviewed publications, has edited a book on Oxidative Stress and Biomaterials, and is an associate editor of the Journal of Biomedical Materials Research Part B. Along with Dr. Zach Hilt, he is the Co-founder of Bluegrass Advanced Materials, LLC, a company that is currently developing and commercializing technologies based upon research from their laboratories.

Abstract

Of all the tools employed by the body's defense mechanisms, oxidative stress appears to be the most ubiquitous, broad spectrum, and self-injuring. When oxidative mechanisms have been induced (e.g., the leukocyte respiratory burst), it can result in a degenerative cycle of chronic inflammation and cell death, that further stimulates the release of more harsh oxidants. However, under mild conditions, this oxidative stress stimulates tissue regeneration and cellular upregulation of protective phenotypes, improving the overall viability and prognosis of tissue health. As a result, the body maintains a delicate homeostasis of pro-oxidant generation with antioxidant mechanisms. By designing materials that can actively participate in this process in oxidative stress signally, we are able to better design biomaterials for a range of therapeutic applications, from oral mucositis, tissue engineering to cancer therapy. Here we present how antioxidant poly(beta-amino ester) polymers can be designed for biomaterials applications.