Department of Chemical Engineering Seminar Series

Fighting implant-associated infections with macromolecular therapeutics and diagnostics



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Abstract

Despite sterilization and aseptic procedures, bacterial infections continue to plaque the utility of many medical implant devices. Such infections are difficult to treat because of how the adhered bacteria protect themselves--within a protective biofilm matrix. Alarmingly, bacteria are becoming more resistant to currently-available antibiotics. As an alternative to conventional therapies, we have developed macromolecular therapeutics capable of storing and release nitric oxide, a potent bactericidal agent. We are also implementing new analytical methodologies for measuring nitric oxide in physiological milieu. My presentation will give an overview of implant-associated infections, the synthesis and characterization of macromolecular vehicles capable of spontaneous nitric oxide release, the use and efficacy of such vehicles against bacteria, and the development of microfluidic nitric oxide sensors as tools for point-of-care blood analysis.

Bio

Mark Schoenfisch is a Professor of Chemistry in the Department of Chemistry at the University of North Carolina at Chapel Hill (UNC-Chapel Hill). Dr. Schoenfisch received undergraduate degrees in Chemistry (BA) and Germanic Languages and Literature (BA) at the University of Kansas prior to attending the University of Arizona for graduate studies in Chemistry (PhD). Before starting at UNC-Chapel Hill, he spent two years as a National Institutes of Health Postdoctoral Fellow at the University of Michigan. His research interests include analytical sensors, biomaterials, and the development of nitric oxide release scaffolds as new therapeutics.

