



SEMINAR

Novel Nitric Oxide Releasing Materials and Their Biomedical Applications



Elizabeth J. Brisbois Ph.D.

Department of Surgery
Michigan Medicine
University of Michigan

**Tuesday
February 14, 2017**

2:00PM – 3:00PM

**Harris Corporation
Engineering Center
Room 101A**

Contact: Jodi Peters
Materials Science & Engineering
Phone: 407-823-0607
Email: Jodi.Peters@ucf.edu

Blood/material interaction is critical to the success of biomedical devices, ranging from simple catheters, stents and grafts, to complex extracorporeal artificial organs which are used in thousands of patients every day. Blood-contacting devices suffer from two major clinical problems: 1) platelet activation leading to thrombosis, and 2) infection. One approach to improving the hemocompatibility of blood-contacting devices is to develop materials that release nitric oxide (NO). Nitric oxide is known to have several biological roles, where the effects are highly dependent on its physiological location and concentration. Healthy endothelial cells exhibit a NO surface flux of $0.5 - 4.0 \times 10^{-10} \text{ mol cm}^{-2} \text{ min}^{-1}$ that inhibits platelet adhesion and activation. Macrophages also release NO that acts as a potent natural antimicrobial agent. Polymeric materials that mimic this NO release are expected to have similar antithrombotic and antimicrobial properties. In this presentation, examples of incorporating NO donor molecules such as diazeniumdiolates (NONOates) or *S*-nitrosothiols (RSNOs) in biomedical grade polymers will be discussed, including new methods to modify existing polymeric medical devices (e.g., catheters) with NO donor molecules via a solvent swelling technique. Further, these new materials are used to fabricate “prototype” intravascular catheters and extracorporeal circuits, and evaluated for the hemocompatibility and antimicrobial activity via short-term (4 h) and long-term (1-2 weeks) *in vivo* experiments using clinically relevant animal models.

Biography: Dr. Brisbois is currently a National Institutes of Health (NIH) Postdoctoral Fellow at the University of Michigan Medical School in the Department of Surgery. She currently works in the Extracorporeal Life Support (ECLS) laboratory under the direction of Dr. Robert H. Bartlett (Emeritus Surgeon). She obtained a B.S. degree in Chemistry and a B.S.Ed. in Secondary Education at Concordia University Nebraska in 2008. She earned her Ph.D. in Analytical/Materials Chemistry at the University of Michigan in 2014 under the supervision of Dr. Mark E. Meyerhoff. Prior to her graduate studies, she also gained R&D experience by working as an analyst at Novartis Consumer Health to develop/improve QC testing methods for current and new products.

Currently, Dr. Brisbois' area of focus is in translational research to design and characterize novel nitric oxide releasing polymers and evaluate their potential biomedical applications in animal models. Her research has been well received by peer-reviewed journals resulting in > 20 publications, 4 patent applications, and numerous conference presentations. Throughout her academic career she has been awarded with several honors including an NIH F32 Individual Postdoctoral Fellowship, a career development award from the Michigan Institute for Clinical & Health Research, 2016 Baxter Inc. Young Investigator Award, University of Michigan Department of Chemistry Research Excellence Fellowship, 2 NSF-REUs and Concordia University's Outstanding Graduate in Chemistry award.

For further information please click link below:
<http://mse.ucf.edu/>