



Society for Analytical Chemists OF PITTSBURGH



NOVEMBER MEETING

Monday, November 5, 2007

8:00 p.m.

Duquesne University
Laura Falk Hall

DINNER: Duquesne Ballroom (4th Floor)



MARK E. MEYERHOFF, Ph.D.

PHILIP J. ELVING PROFESSOR OF CHEMISTRY

DEPARTMENT OF CHEMISTRY

UNIVERSITY OF MICHIGAN, ANN ARBOR.

*“Enhancing the Biocompatibility and Analytical Performance of *IN VIVO*
Electrochemical Sensors using Nitric Oxide Releasing/Generating Polymers”*



5:30 PM	Social Hour	Duquesne Ballroom (4th Floor)
6:30 PM	Dinner	Duquesne Ballroom (4th Floor)
7:30 PM	Student Affiliate Meeting	Mellon Hall - Room 410
7:40 PM	Business Meeting	Mellon Science Building - Laura Falk Hall
8:00 PM	Technical Meeting	Mellon Science Building - Laura Falk Hall

ABSTRACT:

The analytical performance of intravascular electrochemical sensors capable of real-time monitoring blood gases and electrolytes in critically ill patients has been limited by problems associated with cell adhesion (platelets) and subsequent thrombus formation on the sensors' surfaces. A novel approach aimed at ultimately solving this fundamental biological response problem is based on fabricating intravascular chemical sensors with outer polymeric films that release/generate low levels of nitric oxide (NO). Such in situ release of NO prevents platelet adhesion/activation on the surface of the devices. Polymer formulations have been developed that provide appropriate rates of NO release required to prevent thrombus formation, without interfering with the sensors' electrochemical response. *In vivo* evaluation of intravascular oxygen sensors prepared with the NO release polymers confirm the enhanced thromboresistivity and concomitant improvement in analytical accuracy. For long term implanted sensors, catalytic polymer coatings capable of continuously generating locally elevated NO from components already in blood (e.g., nitrosothiols (RSNO)) may be useful. Such polymers can be prepared using immobilized Cu(II)-ligand complexes as catalytic sites for conversion of endogenous RSNO species to NO. The relative levels of reactive RSNO species in blood can be rapidly assessed by employing the same polymers as thin catalytic coatings on the surface of electrochemical NO sensors, to yield analytically useful RSNO sensors. Further, the prospects of employing NO release/generation to improve the performance of subcutaneous *in vivo* glucose sensors will be also be demonstrated. Indeed, needle type electrochemical glucose sensors prepared with NO release outer coatings have already been shown to exhibit greatly reduced inflammatory response when implanted subcutaneously in rats, without loss in analytical performance.

DINNER RESERVATIONS:

Please email Larry Senor, Arrangements Co-Chair at senor@pittcon.org, by Thursday, November 1, 2007 to make dinner reservations. Should you not have email, please call Larry at 724-327-4428. If you want to be placed on the permanent dinner list, let Larry know when you RSVP. The entrée for November is Thanksgiving roast turkey breast, stuffing, and mashed potatoes. Dinner will cost \$8 (\$4 for students) and checks can be made out to the SACP. If you have any dietary restrictions, let Larry know when you leave message.

PARKING:

Duquesne University Parking Garage entrance is on Forbes Avenue. Upon entering the garage receive parking ticket and drive to upper floors. Pick up a parking sticker at the dinner or meeting. Contact Dr. Mitch Johnson at Duquesne University if any difficulties arise.

BIOGRAPHY:

Mark E. Meyerhoff is currently Philip J. Elving Professor of Chemistry in the Department of Chemistry at the University of Michigan, Ann Arbor. He received his Ph.D. from the State University of New York at Buffalo in 1979, working with Professor Garry A. Rechnitz. Following a short post-doctoral stint at the University of Delaware, he joined the faculty at Michigan as an Assistant Professor in the Fall of 1979. He was promoted to associate professor in 1985, and to full professor in 1990.

Professor Meyerhoff's primary research interests are in the field of analytical chemistry, particularly the development of new ion-, gas-, and bio-selective electrochemical sensors suitable for direct measurements of clinically important analytes in physiological samples. He also has a very active research program in the area of biomaterials, especially the development and characterization of novel nitric oxide (NO) releasing/generating polymeric materials for biomedical applications. He and his collaborators have authored more than 280 original research papers on these and other topics over the past 28 years.

Professor Meyerhoff received the University of Michigan's Faculty Recognition Award in 1990, was elected as a Fellow by the National Academy of Clinical Biochemistry in 2002, received the ACS-Division of Analytical Chemistry Award in Electrochemistry in 2003, and the Society for Electroanalytical Chemistry's Reilly Award in 2006. He currently serves on the editorial/advisory boards of *Clinical Chemistry*, *Electroanalysis*, *Analytica Chimica Acta*, and *Applied Biochemistry and Biotechnology*. He is also active as a consultant and/or is on the Scientific Advisory Boards of several biomedical companies.