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Department of Chemistry

Seminar

9:45 a.m. Thursday, April 5, 2012 • 331 Smith Hall



Susan Lunte

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Director, Adams Institute for Bioanalytical Chemistry

Neurochemical Applications of Microchip Electrophoresis

Research interests include microanalytical methods for the investigation of the transport and metabolism of peptides across the blood-brain barrier; separation-based sensors employing on-line microdialysis coupled to microchip electrophoresis; cell-based assays on chips; and microchip-based diagnostics for cardiovascular and metabolic diseases.

Website: <http://www.chem.ku.edu/faculty/luntes/index.shtml>

Abstract

Microchip electrophoresis has several advantages for neurochemical studies. These include the ability to analyze submicroliter samples, the potential to perform very fast highly efficient separations and the possibility of integrating the sample preparation and detection components of the analytical system directly into the chip. In this presentation, two examples of the use of microchip electrophoresis for neurochemical investigations will be presented. The first involves the development of a separation-based sensor for near real-time continuous monitoring of amino acids, catecholamines and nitric oxide metabolites in awake freely roaming animals. The ultimate goal is to miniaturize the entire system for on-animal analysis using telemetry control for data acquisition.

The second application involves the development of an analytical method for the detection of peroxynitrite in single cells. Peroxynitrite (ONOO^-) is a highly reactive, short-lived chemical species formed by the reaction of nitric oxide ($\text{NO}\cdot$) and superoxide ($\text{O}_2\cdot^-$) in vivo. Microchip electrophoresis with electrochemical and laser induced fluorescence detection are currently being employed to investigate nitric oxide generation and metabolism in Jurkats cells and macrophages. The ultimate goal is to develop an analytical system for the detection of peroxynitrite and other nitric oxide metabolites present in single macrophages.

Host: Professor Edgar Arriaga
Refreshments will be served prior to the seminar.