



# Society for Analytical Chemists OF PITTSBURGH



## OCTOBER MEETING

***Monday, October 1, 2007***

**8:00 p.m.**

Duquesne University  
Laura Falk Hall

DINNER: Duquesne Ballroom (4th Floor)



**JONATHAN V. SWEEDLER, PH.D**

LYCAN PROFESSOR OF CHEMISTRY  
UNIVERSITY OF ILLINOIS AT URBANA/CHAMPAIGN

*“Understanding Neurochemistry Neuron by Neuron:  
New Measurement Technologies for Neuroscience Research”*



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:**

Why study the chemical content of individual cells? Understanding the functioning of our brain is hampered by a lack of knowledge of the full complement of neurotransmitters and neuromodulatory compounds used in many brain regions. As neurochemistry can be different even in adjacent neurons, single cell measurements allow a unique perspective on cell-cell signaling. Because neurotransmitters range from gaseous molecules such as NO to large peptides that are only bioactive with particular posttranslational modifications, a variety of capillary separations and sample-limited mass spectrometric approaches have been developed in our laboratory to perform single cell measurements. Here, the sampling and chemical characterization approaches to allow such measurements are highlighted. Several capillary electrophoretic methods enable neurotransmitters to be measured at individual neurons and at neuronal release sites. Mass spectrometric approaches ranging from single cell MS, single bead solid phase extraction and MS-based imaging are described. Using such technology, new serotonin-related compounds and literally hundreds of new neuropeptides have been characterized. These technologies are compared for characterizing neurotransmitters from well-characterized neuronal networks from several neuronal model systems.

### **BIOGRAPHY:**

Jonathan V. Sweedler obtained a Ph.D. in analytical chemistry from the University of Arizona in 1988 (supervisor: Professor M. Bonner Denton). He spent three years at Stanford as a National Science Foundation Postdoctoral Fellow in the laboratories of Richard N. Zare (Chemistry) and Richard H. Scheller (Neuroscience). He then moved to the University of Illinois at Urbana / Champaign, where he currently is a Lycan Professor of Chemistry. He is the director of the UIUC Carver Biotechnology Center, and has appointments in the Neuroscience Program, the Department of Physiology, the Beckman Institute, the Institute of Genomic Biology and the Bioengineering Program. His research interests are in bioanalytical chemistry, and focus on developing new methods for assaying small volume samples, and applying these methods to study novel neurochemistry. He and his group are developing new sampling methods interfaced to capillary scale separations, nanoliter volume NMR, single-cell mass spectrometry, information rich spectroscopic detectors for capillary-scale separations, and hybrid nanofluidic/microfluidic devices for neuronal sampling. Using this suite of technologies, he is investigating the roles that peptide hormones, neurotransmitters and neuromodulatory agents play in behavior, learning and memory. He has received numerous awards including the SACP Pittsburgh Analytical Chemistry Award, the Merck Prize, the Instrumentation Award from the Analytical Division of the ACS, the Gill Prize, the Benedetti-Pichler Award for Microanalysis, and is currently an associate editor of Analytical Chemistry.

### **DINNER RESERVATIONS:**

Please email Larry Senor, Arrangements Co-Chair at [senor@pittcon.org](mailto:senor@pittcon.org), by Thursday, September 27, 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 October is German Wiener Schnitzel, Spaetzle, Red Cabbage. 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.