



Society for Analytical Chemists of Pittsburgh

FEBRUARY MEETING

Monday, February 5, 2018



DUQUESNE
UNIVERSITY



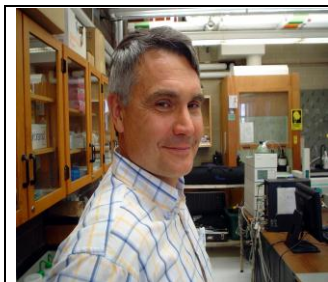
in Pittsburgh

Social Hour – 5:00 PM – Shepperson Suite
Dinner – 6:30 PM – Power Center Ballroom C
Technical Program – Power Center Ballroom C
Business Meeting – Power Center Ballroom C
Student Affiliate Meeting – Shepperson Suite

Deadline for Dinner Reservations:

[ONLINE RESERVATION FORM](#)

TECHNICAL PROGRAM



Janusz Pawliszyn

University Professor and Canada Research Chair
University of Waterloo

"In-vivo Application of SPME"

There is a growing interest in monitoring levels of biologically active compounds in living systems in their natural environments. These efforts are a significant departure from conventional 'sampling' techniques, where a portion of the system under study is removed from its natural environment, and the compounds of interest extracted and analyzed in a laboratory environment. There are two main motivations for exploring these types of investigations. The first one is the desire to study chemical processes in association with the normal biochemical milieu of a living system, and the second one is the lack of availability or impracticality of removing suitable samples from a living system, frequently because of size.

In the presentation, I will describe the use of solid-phase microextraction (SPME) for in vivo sampling of endogenous compounds, drugs and metabolites in the tissue of freely moving animals as well as humans, which eliminates the need for tissue withdrawal in order to obtain quantitative analytical information. In comparison to the established in-vivo technique of microdialysis, such chemical biopsy probe provides the advantages of reduced matrix effect improved spatial resolution, improved extraction of hydrophobic species and large molecular species and better compatibility with LC-MS because of elimination of salts and associated ionization suppression effects associated with large amounts of phospholipids extracted. In contrast, in-vivo microdialysis provides better temporal resolution and capability of semi-continuous monitoring in almost real-time.

The chemical biopsy in-vivo SPME method was evaluated in collaboration with medical staff at Center for Addiction and Mental Health, Toronto General and Toronto Western Hospitals. Up-to-date the technique was demonstrated useful during lung and liver transplantation, brain function monitoring during deep brain stimulation and drug administration, in vivo lung perfusion for local chemotherapy, and more recently, brain tumor metabolomic study. The study demonstrates feasibility of the method to extract wide range of metabolites, what allowed differentiating studied individuals and determining potential biomarkers of organ function. Also, the technique proved to be capable to monitor level and distribution of drugs over the time of surgery. The coated microfibre can be directly coupled to analytical instrumentation,

such as mass spectrometer, permitting to obtain close to real-time results thus allowing for immediate action at the operation table. In the similar way to biopsy needle, chemical biopsy SPME device can be also placed in the organ through the skin by using guide cannula or via endoscope. Introduction of one of the available calibration approaches and reduced level of matrix effect characteristic to SPME makes the method fully quantitative.

BIOGRAPHY: The primary focus of Professor Pawliszyn's research program is the design of highly automated and integrated instrumentation for the isolation of analytes from complex matrices and the subsequent separation, identification and determination of these species. The primary separation tools used by his group are Gas Chromatography, Liquid Chromatography and Capillary Electrophoresis coupled to variety of detections systems, including range of mass spectrometry techniques. Currently his research is focusing on elimination of organic solvents from the sample preparation step to facilitate on-site monitoring and in-vivo analysis. Several alternative techniques to solvent extraction are investigated including use of coated fibers, packed needles, membranes and supercritical fluids. Dr. Pawliszyn is exploring application of the computational and modeling techniques to enhance performance of sample preparation, chromatographic separations and detection. The major area of his interest involves the development and application of imaging detection techniques for microcolumn chromatography, capillary electrophoresis and micro chip separation devices.

Professor Pawliszyn has supervised 45 PhD and 64 MS students and he is an author of over 650 scientific publications and a book on Solid Phase Microextraction. His Hirsch Index (H-index) is 88. He is a Fellow of Royal Society of Canada and Chemical Institute of Canada, editor of *Analytica Chimica Acta*, *Trends in Analytical Chemistry* and a member of the Editorial Board of *Journal of Separation Science* and *Journal of Pharmaceutical Analysis*. He initiated a conference, "ExTech", focusing on new advances in sample preparation and disseminates new scientific developments in the area, which meets every year in different part of the world. He received the 1995 McBryde Medal, the 1996 Tswett Medal, the 1996 Hyphenated Techniques in Chromatography Award, the 1996 Caledon Award, the Jubilee Medal 1998 from the Chromatographic Society, U.K., the 2000 Maxxam Award from Canadian Society for Chemistry, the 2000 Varian Lecture Award from Carleton University, the Alumni Achievement Award for 2000 from Southern Illinois University, the Humboldt Research Award for 2001, 2002 COLACRO Medal, 2003 Canada Research Chair, in 2006 he has been elected to the most cited chemists by ISI, in 2008 he received A.A. Benedetti-Pichler Award from Eastern Analytical Symposium, 2008 Andrzej Waksmundzki Medal from Polish Academy of Sciences, 2008 Manning Principal Award, 2010 Torbern Bergman Medal from the Swedish Chemical Society, 2010 Ontario Premier's Innovation Award, 2010 Marcel Golay Award, 2010 ACS Award in Separation Science and Technology, 2011 PittCon Dal Nogare Award, 2012 E.W.R. Steacie Award, 2013 CIC Environmental Research and Development Award, 2013 CIC LeSueur Memorial Award, 2015 Maria Skłodowska-Curie Medal from Polish Chemical Society, 2015 Halász Medal Award from the Hungarian Society for Separation Sciences, 2017 Pittsburgh Conference Analytical Chemistry Award, the 2017 Eastern Analytical Symposium Award for Outstanding Achievements in the Fields of Analytical Chemistry and 2018 ACS Award in Chromatography. He presently holds the University Professor, Canada Research Chair and Natural Sciences and Engineering Research Council of Canada Industrial Research Chair in New Analytical Methods and Technologies.

B.Sc./Chem.Eng., 1977, Technical University of Gdansk

M.Sc., 1978, Technical University of Gdansk

Ph.D., 1982, Southern Illinois University

PDF., 1984, University of Toronto

DINNER RESERVATIONS: Please complete the [Online Dinner Reservation Form](#) NO LATER THAN Wednesday, January 31, 2018. The form is also located under the Meeting Notice on website www.sacp.org. Should you not be able to access the form, please call 412-825-3220, ext. 212 the SACP Administrative Assistant to make your dinner reservation. The entrée choices for February are **Bolognese with Fettuccini OR Roasted Vegetable Bolognese**. Please let us know if you have any dietary restrictions. Dinner will cost \$10 (\$5 for undergraduate students). Checks can be made payable to the SACP.

PARKING: Duquesne University Parking Garage entrance is on Forbes Avenue. Upon entering the garage, you will need to get a parking ticket and drive to upper floors. Bring your parking ticket to the dinner or meeting for a validation sticker. Should any difficulties arise, please contact Duquesne University