The Technology Forum of the SPECTROSCOPY SOCIETY OF PITTSBURGH

— NOVEMBER MEETING —

Wednesday, November 14, 2007
5:30 p.m.
Duquesne University
Mellon Hall of Science (Laura Falk Hall)

Margaret Dunn
President
Stream Restoration Inc.

"The Fascinating Chemistry of Passive Mine Drainage Treatment"

Abstract

"The Fascinating Chemistry of Passive Mine Drainage Treatment"

Margaret Dunn and Stream Restoration Inc. have been successfully treating abandoned mine drainage and cleaning up streams in Pennsylvania. While she would never admit it, Margaret is both nationally and internationally known for her hands out work. She has been adding to the scientific knowledge about water quality and treatment methods. Margaret has also been working on metals recovery from AMD passive treatment systems, specifically those with low pH, iron and manganese. In addition to being a person who "gets the job done" Margaret is an entertaining and energetic speaker.

Biography

Margaret Dunn is a registered Certified Professional Geologist with 30 years of experience in the mining and reclamation field. She is currently the co-founder and President of BioMost, Inc. and founder and President of the nonprofit organization Stream Restoration Incorporated. For the last decade Margaret has been dedicated to restoring watersheds impacted by Abandoned Mine Lands through land reclamation and the installation of environmentally-friendly passive treatment systems and to providing watershed related educational/outreach opportunities for people of all interest levels.

THE TECHNOLOGY FORUM PROGRAM IS FREE AND OPEN TO THE PUBLIC.

For further information concerning this presentation, please send an email to Maggie Hall at mahall@state.pa.us

Specks

SPECTROSCOPY SOCIETY OF PITTSBURGH

NOVEMBER MEETING

Wednesday, November 14, 2007
Technical Program - 8:15 p.m.

DUQUESNE UNIVERSITY
Mellon Hall of Science (Laura Falk Hall)

István Pelczer, PhD

Princeton University

"When more is truly better....Direct mixture analysis using NMR spectroscopy and multivariate s t at is t i c s to characterize complex materials from biofluids to beverages"

6:00 p.m. - Social Hour
6:30 p.m. - Dinner (City View Cafe - 6th Floor)
8:00 p.m. - Business Meeting (Laura Falk Auditorium)
8:15 p.m. - Speaker's Presentation (Laura Falk Auditorium)

Abstract

When more is truly better....Direct mixture analysis using NMR spectroscopy and multivariate statistics to characterize complex materials from biofluids to beverages"

Mixture analysis and characterization can proceed using more conventional protocols using a variety of separation techniques followed by specific, component-oriented analytical measurements. A powerful alternative is to study the mixtures directly possibly in their native condition in an unbiased, untargeted fashion. One can apply quantitative analytical methods, such as nuclear magnetic resonance (NMR) spectroscopy, and use involved statistical tools to identify varying patterns for characterization. This approach can find correlations and distinguishing features between different samples, respectively, making immediate diagnostic classification possible. In addition, individual components and also more complex, correlated patterns of components which have significant contributions to the variance can also be assessed by this analysis.

This strategy has been implemented and has found extremely important applications in the rapidly growing field of metabolomics/metabonomics, studying all kinds of biofluids, cell extracts and tissues. This kind of analysis helps us to get a much deeper insight into systemic processes and regulations in the living organisms from cells to humans and understand better the fundamental biochemistry. In the same time, the very same protocol can be applied to all kinds of other characteristic mixtures, should it be an environmental sample to identify low-level consistent pollution, industrial samples, those of various foods or beverages for quality control and identifying vintage, place of origin, and many more.

This talk will introduce the conceptual process for direct mixture analysis and will present real-life examples, including those from our own research dealing with horses, malaria parasites, developing stem-cells, and also conducting "beer-omics".

Biography

István Pelczer is a native of Hungary where he started his career as a chemist/NMR spectroscopist in Szeged. Later he moved to Budapest and contributed to pharmaceutical research in the same area, while in the meantime received his Ph.D. from Szeged. He was invited to visit the US, Syracuse, NY, in 1988 by George Levy, which invitation was extended later for a more steady position. In Syracuse he become a Research Assistant Professor while also working as an Application Scientist for NMRi, Inc., a software company designing multidimensional NMR processing and analysis tools, a cutting edge technology of that time. Dr. Pelczer moved to Princeton University, Department of Chemistry early in 1996 where he works since. Besides running the N MR facility as a Sr. NMR spectroscopist he has also become involved in teaching as a Lecturer. He runs a research program mainly focusing on metabolic mixture analysis in biofluids, cells, cell extracts, and various other materials, and has contributed to several proposals for departmental instrument acquisitions and on other topics. He has an extensive record of scientific activity and is author of nearly 100 peer reviewed publications.

Dinner Reservations:

This month's entrée will be Stuffed Flounder Florentine w/ Angel Hair Pasta. Minestrone soup & Caprese salad will start the meal and Triple Chocolate Cheese Cake will be served for dessert.

Please email Carolyn Benga at crbssp@yahoo.com or call (412) 487-0915 to make dinner reservations NO LATER THAN FRIDAY, November 9, 2007. Dinner will cost $8 and checks can be made out to the SSP. If you have dietary restrictions, please let Carolyn know when you RSVP.

Parking Instructions:

The Duquesne University Parking Garage is located on Forbes Avenue. Upon entering the garage, receive parking ticket and drive to upper floors. Pick up a parking chit at the dinner or meeting. If any difficulties arise, contact Dr. Mitch Johnson at Duquesne University.