



# Spectroscopy Society of Pittsburgh September Meeting

Duquesne University – Mellon Hall of Science (Laura Falk Hall)

## Wednesday – September 16, 2009

Technology Forum Speaker's Presentation **5:30PM**

Social Hour **6:00PM**

Dinner in the City View Café (6th Floor) **6:30PM**

Business Meeting **8:00PM**

Technical Program Speaker's Presentation **8:15PM**

Deadline for Dinner Reservations **9/11/09**

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### TECHNOLOGY FORUM - 5:30 PM

Dr. W. Jeff Hurst- The Hershey Company, Hershey PA

#### **“Ethnobotanical Uses of Cocoa In Mesoamerica or Take 2 Kisses and Call Me in the Morning”**

On a regular basis, the popular and scientific press makes mention or publishes a story on the positive health aspects of cocoa. A recent Pub Med search using chocolate cocoa and cardiovascular resulted in 130 citations and 32 reviews. The current interest in the topic commenced in the early 1980's when a scientist interested in hypertension came across a journal entry by a Dr. B.H. Kean, a physician who worked among the Kuna who were Maya descendants. Kean noticed a lower incidence of hypertension among the Kuna who had become resident of an isolated region called the San Blas archipelago. The search was not exhaustive but to illustrate the available information and interest in the topic. While not health related, our recent report on a discovery in the American Southwest resulted in over 255 media spots. This presentation will initially discuss some history of cocoa, some introductory chemistry and the medicinal/ethnobotanical uses of this important commodity in Mesoamerican at the time of the Maya and Aztec.



#### **Bio**

Dr. W. Jeffrey Hurst is a Principal Scientist at the Hershey Company Technical Center. His emphases are in separation science using standard, micro and nanotechniques, laboratory automation, the evaluation of new and emerging analytical technologies, the development and evaluations of methods for the determination for food allergens and the application of nontraditional analytical methods to food analysis. He was the founding editor and editor in chief of Laboratory Robotics and Automation, an international journal with a focus on all facets of automation in the laboratory until it ceased publication. He is the founding editor of the Wiley-Interscience book series on laboratory automation serves on the editorial board of the Journal of Liquid Chromatography and was founding editor of Seminars in Food Analysis. He was a contributing editor for Scientific Computing and Instrumentation and prepared a monthly column on some aspect of instrument and laboratory operations. He is a member of the American Chemical Society (ACS), Laboratory Robotics Interest Group of New Jersey (LRIG), a Professional Member of the Institute of Food Technologies, American Society of Mass Spectrometry (ASMS), a Fellow of the American Institute of Chemists (FAIC), a Certified Professional Chemist (CPC), a Fellow of the Royal Australian Chemical Institute (FRACI) and a Chartered Chemist (CChem). Within the AIC, he is chair of the committees on Advanced Professional Thinking, Local Institutes and co-chair of the Editorial Board of The Chemist. He has served a co-leader of the Chemical Measurement Subgroup in the ACS/AICChE/CMA Chemical Industry Technology Roadmap. He is a member of the Continuing and Distance Education Faculty of Penn State University and serves as Adjunct Professor of Comparative Medicine and a member of the graduate faculty at the M.S. Hershey Medical Center. He also has served on graduate examination committees at McGill University, Montreal, Quebec, Canada, Duquesne University and the University of Cordoba, SPAIN. In 1986 he was awarded a Pioneer in Laboratory Automation award by the International Symposium on Laboratory Robotics and in 2000 was named a Fellow of AOAC International. He is senior author of Laboratory Robotics, A Guide to Planning Programming and Applications, editor of Automation in the Laboratory, English language editor of Analytical Techniques for Food and Agricultural Products, editor of Electronic Noses and Sensor Array Based Systems and

is editor of *Analysis of Functional Foods and Nutraceuticals*. He is an author on over 200 papers and presentations. He has developed in excess of 175 methods using chromatography, spectroscopy, spectrometry, immunoassay and assorted analytical techniques on food, environmental and biological samples. He also serves on the Analytical Methods Review Committee of the American Herbal Pharmacopoeia (AHP). He has participated in a peer review panel of the Institute for Regulatory Sciences on Chemical Analysis Automation and also participated on NSF Review Panels for Educational Chemical Instrumentation. He also serves as a reviewer for numerous journals including *J. Chromatography*, *Journal of Liquid Chromatography*, *Journal of Ag and Food Chem.*, *Journal of Food Science*, *Analytical Chemistry* and *Annals of Internal Medicine* to list a few.

He is active in his community by serving as President of the Mt Gretna Campmeeting Association Board of Managers, Additionally, he is a member of the Mt Gretna Arts Council, Chair of the Scholarship Committee, a Trustee of the Mt Gretna Area Historical Society and Chair of the Museum Committee



#### **TECHNICAL PROGRAM - 8:15PM**

Ira W. Levin, Ph.D. - National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health

#### **“Interlacing Basic Biophysical Research with Translational Clinical Studies: From Bench to Bedside and Back”**

Within biomedical venues significant emphasis is currently directed toward advancing medical science through interdisciplinary collaborations in which laboratory methodologies are readily modified both for understanding the molecular biology of human disease and for adaptation to clinical usage. We will introduce these concepts with several examples from our laboratory in which we apply spectroscopic techniques toward elucidating structural and biochemical characteristics of systems ranging from supramolecular assemblies to cellular organelles, tissues and organs. Specifically, we will touch upon high throughput spectroscopic imaging approaches to identify molecular biomarkers, in, for example, pharmacodynamic assessments of global protein modifications in cells treated with anticancer agents, such as histone deacetylase and proteasome inhibitors, agents used in ongoing clinical trials. In continuing collaborations with pathologists and oncologists, high-throughput vibrational spectroscopic imaging approaches have been successfully adapted to studies developed for histopathologic recognition. In examining structural elements relevant to the cellular membrane, we

have investigated the putative roles of fluctuating lipid microdomains in regulating lipid bilayer behavior in various biological processes. We note that vibrational spectroscopic imaging techniques applied at the supramolecular level provide additional insights into biochemical processes as the spatial resolution approaches the nanometer scale. Our laboratory has participated directly at the patient level in collaborations with cardiologists and transplantation surgeons. For example, we will describe procedures in which visible reflectance imaging techniques are used to aid surgeons in performing laparoscopic procedures by allowing the assessment of tissue oxygenation and vessel differentiation despite significant visual limitations.

#### **Bio**

Dr. Levin received his B.S. degree from the University of Virginia and his Ph.D. degree from Brown University, as well as having engaged in postdoctoral experience at the University of Washington and having served a tour in the military. Having spent his professional career at the National Institutes of Health, he is currently Director of the Division of Intramural Research, National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health, in addition to being Chief, of the Section on Molecular Biophysics, at the NIH campus in Bethesda, Maryland. His research interests lie primarily in the applications of vibrational infrared and Raman spectroscopic techniques toward the elucidation of the conformational, dynamical, thermodynamic, and functional properties of both intact and model membrane assemblies and related systems. Emphasis is placed on investigating the specific lipid-lipid and lipid-protein interactions governing biomembrane reorganizations. In particular, his efforts are directed toward defining and characterizing lipid microdomain formation as it pertains both to the existence of lateral heterogeneities and transverse asymmetries within biological membranes and to the ability and extent of these fluctuating microclusters, or domain motifs, to modulate integral membrane protein behavior. He has been at the forefront of developing spectroscopic infrared, Raman and visible reflectance imaging instrumentation. Specifically, his laboratory has provided pioneering technologies and studies in spectroscopic Fourier-transform infrared and Raman microimaging. Current efforts are in actively translating laboratory imaging research into clinical venues ranging from monitoring disease progression by means of

spectroscopic histopathologic classifications to in vivo hyperspectral visible reflectance imaging for assessing tissue perfusion, vascular disease and endothelial dysfunction. Recent research efforts also involve the use of vibrational infrared spectroscopic imaging to pharmacodynamically characterize, monitor and quantify molecular changes mediated by specific drug introduction.

Dr. Levin has been internationally recognized for his spectroscopic accomplishments and has been honored with many awards, including the Bomem-Michelson Award by the Coblentz Society, the Meggers Award (three separate award occasions) presented by the Society for Applied Spectroscopy, the distinguished Harold A. Iddles Lecture Series sponsored by the University of New Hampshire, and is a Fellow of the American Physical Society's Biophysical Division and, separately, a Fellow in the their Division of Chemical Physics. He has also received the Lippincott Award in Vibrational Spectroscopy presented by the Optical Society of America. Dr. Levin is a Fellow of the Society for Applied Spectroscopy and has received Honorary Membership in the Society for his pioneering technologies and studies in spectroscopic Fourier transform infrared and Raman microimaging. Dr. Levin has also received the New York Section of the Society for Applied Spectroscopy Gold Medal Award for his spectroscopic research contributions. He has served on numerous editorial and foundation advisory boards and committees in various leadership capacities, has lectured extensively, and has authored and coauthored approximately two hundred and thirty publications, in addition to several patents, over the course of his career. Dr. Levin is a member of the American Chemical Society, the American Physical Society, the American Society for Biochemistry and Molecular Biology, the Biophysical Society, the Coblentz Society, and the Society for Applied Spectroscopy.

**Dinner Reservations:**

Please email Carolyn Benga at [crbssp@yahoo.com](mailto:crbssp@yahoo.com) or call (412) 487-0915 to make dinner reservations NO LATER THAN FRIDAY, September 11, 2009. This month's entrée is beef tenderloin with horseradish sauce served with baby red-skinned potatoes and broccoli. Salad will start the meal, and fresh raspberries topped with crème fraîche will be served for dessert. 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.