

THE BARNETT GAZETTE

The Barnett Institute of Chemical and Biological Analysis

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FIRST SAFERSTEIN MEMORIAL LECTURES DELIVERED



From left: Senior Vice President Richard Meyer and Dr. Karger present a plaque to recognize and thank Dr. Richard Saferstein.

Dr. Walter P. Rowe of the Department of Forensic Science, George Washington University, delivered the first Francine and Michael Saferstein Memorial Lectures in Forensic Science on February 8 and 9. The new Lectures are endowed with a gift from Advisory Council Member Dr. Richard Saferstein in memory of his late wife and son.

Dr. Rowe completed his Ph. D. in physical chemistry at Harvard University with E. Bright Wilson. He received criminalistics training and experience in the US army crime laboratory system in Ft. Gordon, GA and Frankfurt-am-Main, Germany. In his Public Lecture "Pulp Fiction – The Myth and the Reality of Forensic Science," Dr. Rowe reviewed crime, mystery and science fiction movies and TV series as sometimes-effective ways of teaching science and the use of physical evidence in the criminal justice system. In the real world of the courtroom, the expert witness can make up for lack of eyewitness

nesses provided the evidence is sound, representative and within the existing legal framework. Several examples of useful trace evidence illustrated this point well. Dr. Rowe's Technical Lecture entitled "From the Laboratory to the Courtroom" discussed increasingly powerful analytical techniques being used in criminalistics and further



From left: Massachusetts State Crime Laboratory Director Carl Selavka, Boston Crime Laboratory Director Donald Hayes, Richard Saferstein, College of Criminal Justice Associate Dean Robert Croatti and Dean Jack Greene and Supervisor Edward Bernstine of the Agawam Satellite Laboratory, Massachusetts State Crime Laboratory.

explored rules of evidence admissibility and actual case situations, for example studies of tissue and DNA degradation clarify environmental effects on evidence. Dr. Donald Hayes (Laboratory Director) and his staff hosted a visit by the Lecturer to the Boston Crime Laboratory. Fox Television interviewed Drs. Karger, Rowe and Saferstein for the "Dead in the Woods" feature broadcast on February 11.



Dr. Walter F. Rowe of George Washington University presents the first Saferstein Lecture.

A dinner on Feb. 8 to honor Richard and Neal Saferstein and mark the first Saferstein Lecture included remarks by Senior Vice President for Development Richard L. Meyer and Dr. Jack Greene, newly appointed Dean of the College of Criminal Justice. Vice President Meyer stressed the value of special gifts to support strong programs. Dean Greene is working with local and regional criminal justice

systems on new collaborations. Also welcome guests at the dinner were Dr. Hayes and Dr. Carl Selavka (Director of the Massachusetts State Crime Laboratory and an Institute alumnus). Special guests of the Safersteins were James Hamilton, Stan Laser and John Wherry. A very pleasant occasion was enjoyed by all.

The new Saferstein Lectures were well received and we look forward to hosting more leading experts in analytical and forensic science in the future.

HUMIC SUBSTANCES SEMINAR IV HOSTED

Humic substances (HSs) are the brown biomaterials responsible for water retention, nutrient supply and toxin removal in soils. Increasing erosion, desertification and pollution are making understanding HSs ever more important.

The Institute and the HA Research Group hosted Humic Substances Seminar IV on March 22-24. The Honorary Chair was Michael Hayes (University of Limerick) and the Honored Guest was Morris Schnitzer, who received the Wolf Prize for Agriculture in 1996. The Seminars are now the major annual conference on humic substances research and commercial applications. Seminar IV had an Exhibit by the following organizations: Arctech, Inc. (Chantilly,



From left: Seminar hosts Aleksandr Cherkasskiy, Dina Sorour, Yam-Yuen Lam, Rashed Kesilman, Matthew Mulligan, Elham Ghabbour, Ahmed El-Shafey, Marcy Vozzella and Geoffrey Davies

VA), Biomin, Inc. (Ferndale, MI), Fisher Scientific LLC (Suwanee, GA), Horizon Ag-Products, Inc. (Kennewick, WA), Humate International, Inc. (Jacksonville, FL), The International Humic Substances Society, Live Earth Products (Emery, UT), Micromass Ltd (Manchester, UK), The Royal Society of Chemistry (Cambridge, UK), Springborn Laboratories, Inc. (Wareham, MA), U-Mate International, Inc. (Scottsdale, AZ) and The USDA-NRCS-

National Soil Survey Center (Lincoln, NE). A full day of HSs applications papers was included in the program of 36 presentations by nearly 100 authors from 16 countries. HSs formation, aggregation and redox chemistry were special focus areas. Seminar participants visited the Institute to tour the facilities and discuss ongoing research.

Financial support for Seminar IV from Arctech, the US Chapter of IHSS, The Royal Society of Chemistry, Fisher Scientific and the College of Arts and Sciences is gratefully acknowledged. Seminar papers will be published as the book *Humic Substances: Versatile Components of Soil and Water*, E. A. Ghabbour and G. Davies, Eds., by The Royal Society of Chemistry in November 2000. Seminar V is scheduled at Northeastern from March 21-23, 2001, with Dr. C. E. Clapp (University of Minnesota) as Honorary Chair. The registration and abstracts deadline is Dec. 30, 2000 (see www.hagroup.neu.edu for details and updates).

NOVARTIS AGRICULTURAL DISCOVERY INSTITUTE HOSTED

On April 27 the Institute welcomed Dr. Xun Wang, Director of RNA Dynamics at the Novartis Agricultural Discovery Institute (NADI) in San Diego, CA along with Drs. Liang Shi, Senior Staff Scientist and Andras Guttman, director of its Microfluidics Group. Andras worked with Dr. Karger as a postdoctoral fellow in the early '90s. Dr. Wang gave a Special Seminar on "Research Strategies in the NADI" and visited with several Barnett research groups. NADI's strategy is to use genomics assisted selection rather than more expensive plant cross breeding and phenotype selection to enhance crop yield, insect resistance and nutritional value. As an example, maize has 50,000-80,000 genes compared to the human's 3,000, and so all the maize genes may never be known. NADI focuses on genetic trait and sequence homology in plants. The NADI visit was especially arranged to demonstrate automated analytical technologies in the Institute. The need for advanced genomics and proteomics instrumentation and planned expansion to 180 researchers at NADI in the next 2 years open new opportunities for cooperation with the Institute.



Dr. Karger congratulates the Year 2000 Barnett Lecturer, Professor Peter Schultz.

PETER SCHULTZ EXHILARATES BARNETT LECTURE AUDIENCE

The Nineteenth Annual Barnett Lecture by Professor

Peter G. Schultz on April 28 gave the large audience an exciting glimpse of tomorrow's chemistry. Dr. Schultz is Professor of Chemistry at the Scripps Institute and Director of the Genomics Institute in the Novartis Foundation in San Diego, CA. He has received many awards, including the ACS Award in Pure Chemistry and the Wolf Prize in Chemistry, and he is a member of the National Academy of Sciences. His Barnett Lecture "Functional Molecules: A Lesson from Nature" gave a broad sweep of his creative work at the chemistry-biology interface. Peter used his hand and fingers to show how nature holds different shaped objects in proteins and antibodies, and how such holding can make the bound molecules catalytic. The immune system is an excellent example of a host's conformational flexibility for matching with a guest. Expanding the natural amino acids up from 20 and the nucleobases up from four creates possibilities for new genes, genomes and proteomes, and new forms of life. Exclusive synthetic base pairs X-Y corresponding to C-G and A-T have been found, with the prospect of X-Y pairing in lab-synthesized mutant DNA. Aging was related to gene misregulation and studies show that genes stay active longer in more active individuals. New biochemical systems and processes are being discovered by combinatorial methods that also are advancing materials science. Dr. Schultz's tour de force kept up the fine tradition of Barnett Lectures at the frontiers of biological and analytical chemistry.



From left: Professor William Thilly (Director, Environmental Health Sciences, MIT), Bradstreet Professor and Faculty Fellow Roger Giese (Pharmaceutical Sciences) and Professor David Forsyth (Chair, Chemistry Department) confer with Professor Schultz.



Professor of Biology Carol Warner.

PROFESSOR CAROL WARNER SPEAKS ON EMBRYO RESEARCH

On April 18, Distinguished University Professor of Biology and Adjunct Faculty Fellow Carol Warner gave a Special Institute Seminar. Her research uses genomics, proteomics and imaging to study early mammalian embryo survival. Main focus areas are (1) genes that modulate preimplantation growth; (2) genes that modulate programmed cell death (apoptosis) in unfertilized eggs (oocytes) and preimplantation embryos; and (3) image analysis to distinguish healthy oocytes and embryos. Most of her research uses the mouse model, but some joint work on human embryos with the Institute for Reproductive Medicine and Science of St. Barnabas (West Orange, NJ) is ongoing.

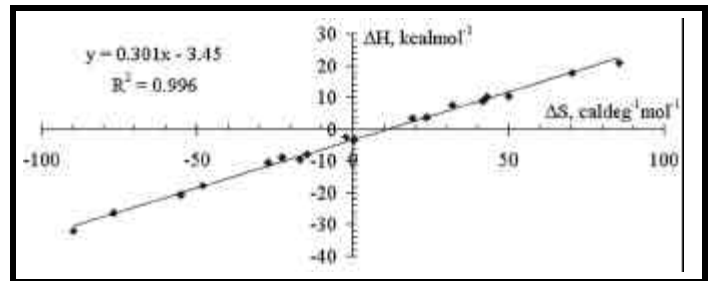
Image analysis in collaboration with Chuck DiMarzio (Engineering, NU) is part of the new Center for Subsurface Imaging Systems (CenSSIS) headed by Mike Silevitch in the School of Engineering. Images of live oocytes and embryos obtained with a newly developed Quadrature Tomographic Microscope (QTM) allow healthy and unhealthy oocytes and embryos to be distinguished without threatening their viability. This is important in selecting healthy oocytes and embryos for in vitro transplantation. Prof. Warner discovered a gene called Ped that influences the rate of preimplantation embryonic development and embryo survival. In a recent collaboration with Barry Karger she achieved rapid throughout DNA sequencing of the gene(s) that encode the Ped gene product, a major histocompatibility complex (MHC) class Ib protein called Qa-2. Future collaboration will use MS to find structures of the nine amino acid peptides bound to Qa-2.

Genes that modulate apoptosis are of the caspase and Bcl-2 protein families. Prof. Warner's lab has been first to describe mRNA and protein expression of many genes in these families in oocytes and preimplantation embryos. Her talk was well-received, with many questions and fruitful interactions with Barnett Institute members.

RECENT RESEARCH HIGHLIGHTS

How Soils Are Buffered

Brown biomaterials called humic acids (HAs) are responsible for water retention, pH buffering, solute sorption and metal binding in soils and sediments. HAs are nature's most abundant form of carbon. They mostly exist in soils as coatings on clays or as waterlogged hydrogels. The Humic Acid Research Group has found that metal cation binding by solid HAs from different soils obeys the Langmuir model. This model generates a binding site capacity v and a binding equilibrium constant K . Studies at different temperatures give the heat change ΔH and the disorder change ΔS for metal binding. The Figure shows the plot of ΔH vs. ΔS for binding of seven metals to six different solid HAs. The straight line indicates that when solid HAs bind a metal they can either absorb heat to release water or release heat to bind water with the metal. Systems with this linear behavior are called free energy buffers, as demonstrated here for solid HAs.



Genome and Proteome

Dr. Karger's group continues to develop new technologies for genomics and proteomics. In the DNA area, under a NIH Genome Institute grant, they are working on a robust sequencing instrument that routinely reads 1000 or more bases per run. Other studies, in collaboration with Professor Bill Thilly, MIT, involve high throughput discovery of point mutations in the coding region and splice sites of the genome.

In the proteomics field, the focus has been on coupling liquid infusion and separation to mass spectrometry. Microchip devices have allowed rapid analysis of samples in microtiter wells by ESI/MS. Additionally, a new vacuum deposition interface for MALDI/MS has been constructed. This interface allows uniform sample deposition with detection at the low attomole level. These devices are being used to analyze protein digests (peptide maps) as a means of high throughput protein identification and characterization of post-translational modifications.

HOT OFF THE PRESS!

A Sample of Recent Publications by Institute Members

Barry Karger

Zhou, H.; Miller, A. W.; Sosic, Z.; Buchholz, B.; Barron, A. E.; Kotler, L.; Karger, B. L. DNA sequencing up to 1300 bases in two hours by capillary electrophoresis with mixed replaceable linear polyacrylamide solutions. *Anal. Chem.* 72, 1045 (2000).

Zhang, B.; Liu, H.; Karger, B. L.; Foret, F. Microfabricated devices for capillary electrophoresis-electrospray mass spectrometry. *Anal. Chem.* 72, 1015 (2000).

Tim, R. C.; Kautz, R. A.; Karger, B. L. Ultratrace analysis of drugs in biological fluids using affinity probe capillary electrophoresis. Analysis of dorzolamide with fluorescently labeled carbonic anhydrase. *Electrophoresis*, 21, 220 (2000).

Minarik, M.; Foret, F.; Karger, B. L. Fraction collection in micropreparative capillary zone electrophoresis and capillary isoelectric focusing. *Electrophoresis*, 21, 247 (2000).

Foret, F.; Zhou, H.; Gangl, E.; Karger, B. L. Universal subatmospheric electrospray interface for coupling of microcolumn separations with mass spectrometry. *Electrophoresis*, 21, 1363 (2000).

Karger, B.L.; Foret, F.; Kirby, D.P. Subatmospheric, Variable pressure sample delivery chamber for electrospray ionization/mass spectrometry and other applications. US Patent 6,068,749 (2000).

Roger Giese

Lu, R. J.; Giese, R. W. AMACE1: Versatile aminoacetamide electrophore reagent. *Anal. Chem.*, 72, 1798 (2000).

Wang, P.; Giese, R. W. Laser-induced electron capture mass spectrometry. *Anal. Chem.*, 72, 772 (2000).

Graham Jones

Qabaja, G.; Perchellet, E. M.; Perchellet, J-P.; Jones, G. B. Regioselective lactonization of naphthoquinones. Synthesis and antitumoral activity of the WS 5995 antibiotics. *Tetrahedron Lett.*, 41, 3007 (2000).

Jones, G. B.; Plourde II, G. W.; Wright, J. M. Understanding enediyne-protein interactions. Diyl atom transfer results in generation of aminoacyl radicals. *Org. Lett.* 2, 811 (2000).

Jones, G. B.; Wright, J. M.; Plourde II, G. W.; Hynd, G.; Huber, R. S.; Matthews, J. E. A direct and stereocontrolled route to conjugated enediynes. *J. Am. Chem. Soc.* 121, 1937 (2000).

Jones, G. B.; Guzel, M.; Mathews, J. E. Stereoselective route to mitosanes via tricarbonyl- μ 6-arene chromium complexes. *Tetrahedron Lett.* 41, 1123 (2000).

Jones, G. B.; Hynd, G.; Wright, J. W.; Sharma, A. On the selective deprotection of trityl ethers. *J. Org. Chem.*, 65, 263 (2000).

Paul Vouros

Andrews, C. L.; Vouros, P.; Harsch, A. Analysis of DNA adducts using high-performance separation techniques coupled to electrospray ionization mass spectrometry. *J. Chromatogr. A*, 856, 515 (1999).

Gangl, E. T.; Turesky, R. J.; Vouros, P. Determination of in vitro- and in vivo-formed DNA adducts of 2-amino-3-methylimidazo[4,5-f]quinoline by capillary liquid chromatography/microelectrospray mass spectrometry. *Chem. Res. Toxicol.*, 12, 1019 (1999).

Harsch, A.; Marzilli, L. A.; Bunt, R. C.; Stubbe, J.; Vouros, P. Accurate and rapid modeling of iron-bleomycin-induced DNA damage using tethered duplex oligonucleotides and electrospray ionization ion trap mass spectrometric analysis. *Nucleic Acid Res.*, 28, 1978 (2000).

LISTEN TO THIS!

Some Recent Presentations by Institute Members

Karger, B. L., Plenary Lecturer, "Analytical Tools for the Post Genome Era," HPCE 2000: 13th International Symposium on Microscale Separation and Analysis Techniques, Saarbrücken, Germany, February, 2000.

Foret, F.; Zhang, B.; Karger, B. L., "Design of an Integrated System for Automated High Throughput CE-ESI/MS using Microfluidics", HPCE 2000, Saarbrücken, Germany, February, 2000.

Miller, A. W.; Karger, B. L. Automated optimization of expert system for base-calling in DNA sequencing. DOE Human Genome Program Contractor-Grantee Workshop VIII, Santa Fe, New Mexico, February, 2000.

Zhou, H., Miller, A. W., Sosic, Z., and Karger, B. L. Routine DNA sequencing by capillary electrophoresis: 1300 bases in two hours. HPCE 2000, Saarbrücken, Germany, February, 2000.

Karger, B. L., Invited Lecturer, "High Throughput Separations in DNA and Protein Analysis," Csaba Horvath's 70th Birthday Symposium, Pittsburgh Conference, New Orleans, LA March, 2000.

Davies, G. "Adventures with Humic Acids," University of Lowell, March, 2000.

De Nobili, M.; Niraneza, J.; Ghabbour, E. A.; Davies, G. "Back to the Future. Critical Analysis and Perspectives of Electrophoretic Techniques Applied to Humic Substances at the Beginning of the New Millennium," Humic Substances Seminar IV, Northeastern University, March, 2000.

Foret, F.; Zhang, B.; Rejtar, T.; Karger, B. L. "Microdevices for Mass Spectrometry", 216th ACS National Meeting, San Francisco, March, 2000.

Jones, G. B. "Chemical and Biological Applications of Designed Enediynes," University of Southampton, Southampton, UK, March, 2000.

Jones, G. B. "Chemical and Biological Applications of Designed Enediynes," Novartis, Horsham, UK, March, 2000.

Jones, G. B.; Qabaja, G.; Goldberg, I. H. "Synthesis and DNA Binding of Spirocyclic Model Compounds Related to the Neocarzinostatin Chromophore," 219th National ACS Meeting, San Francisco, CA, March, 2000.

Davies, G.; Ghabbour, E. A. "The thermodynamics of metal binding by solid humic acids," University of Northern Arizona, Flagstaff, AZ, April, 2000.

Davies, G. "Adventures with Humic Acids," University of Arizona, Tucson, AZ, April, 2000.

Jones, G. B. "Chemical and Biological Applications of Designed Enediynes," Scripps Research Institute, La Jolla, CA, April, 2000.

Foret, F.; Zhang, B.; Karger, B.L. "Microdevices for Mass Spectrometry," μ TAS 2000, Enshede, Netherlands, May, 2000.

A Full View of DNA Adducts

Dr. Giese's group has been developing new methodology for broad-spectrum detection of DNA adducts. Current methods only detect a few adducts, or a single subclass, at a time. This Group has developed (and patented) a new kind of reagent called an "IMI dye" that specifically labels the phosphate group of a nucleotide under aqueous conditions. This not only opens the door to broad spectrum detection of DNA adducts by capillary electrophoresis with laser-induced fluorescence detection, but also the IMI-nucleotide conjugate can be detected with high sensitivity by MALDI-MS. Recently, the method was selected for funding by NIEHS as a good way to discover unknown DNA adducts that may be caused by chlorination disinfectant byproduct mutagens in drinking water. The IMI technology was initiated by Poguang Wang in Dr. Giese's lab and then developed further by Zhang-Hua Lan and Xiaohang Shen. As an ongoing collaborative project with William Thilly at MIT, Xiaohua Qian, Jianxin Gao and Aijian Liu at Northeastern currently are refining and applying the method to detect unknown DNA adducts in human lung. Two additional patent applications are being filed based on recent developments in the method.

JULIE LEARY ON MASS SPECTROMETRY



Professor Julie Leary
University of California, Berkeley.

The joint Chemistry/Barnett Colloquium on March 2 featured Dr. Julie A Leary, Research Professor in the Chemistry Department, University of California, Berkeley, and Director of Analytical Services at UCB. Her talk "Metals, Ligands, Carbohydrates and Mass Spectrometry" covered many aspects of frontier bioanalysis, including studies of combinatorial libraries of enzyme inhibitors with FT-ICR-MS and using metals

and ligands as coordinating and/or derivatizing groups for peptide and carbohydrate structures elucidation. Prof. Leary completed her BS degree with Prof. Eugene Barry at the University of Massachusetts at Lowell. Over the years, Prof. Barry has encouraged very talented students to complete their doctoral work at Northeastern, in many cases with Dr. Karger. Prof. Leary will be awarded the 2000 Biemann Medal for significant achievement in mass spectrometry by an individual early in his or her career at the American Society of Mass Spectrometry annual meeting in Long Beach, CA in June.

THE INSTITUTE'S NEW NAME!

The Barnett Institute will soon change its name (for the third name in our history). Established in 1973 as the Institute of Chemical Analysis, Applications and Forensic Science, the name was changed to the Barnett Institute of Chemical Analysis and Materials Science in 1984 to recognize the substantial endowment provided by Dr. Louis Barnett and his wife Madlyn and to best describe our major missions at that time.

As agreed by the Institute's Advisory Council and Provost David Hall, from July 1, 2000 the Institute will be known as the

Barnett Institute of Chemical and Biological Analysis

to reflect the strong focus on bioanalysis and biotechnology in our major research activities. We have jumped the gun a little and started using the new name in this Gazette.

We are sure everyone wishes the newly named Institute the best of success in its future work at Northeastern.

BIOTECHNOLOGY UPDATE

The Biotechnology Initiative is moving forward with seed money from the Provost's Office to hire a Project Manager. Northeastern is uniquely situated to make a major impact in biotechnology that is technology driven. Dean Patrick Plunkett of the Bouve College of Health Sciences and Dean James Stellar of the College of Arts and Sciences are fully involved and enthusiasm is high. We look forward to reporting that the Biotechnology Initiative is up and running in the near future.

Chemometrics for Market Analysis: An Interdisciplinary Graduate Program (Part I)

Bill Giessen

Over the last few years, Institute affiliated faculty, staff and students have built a research program that applies the powerful methods of chemometrics to economic and market analysis and bridges the “interspecies barrier” between these fields. Our Institute is set up to explore and tackle issues such as these: the methodology involved is analytical, which befits the Institute mission.

With corporate sponsorship, we have set up the Interest Group on Commodity Market Data Analysis (CMDA). The group consists of Faculty Fellow and Professor of Physics Bob Markiewicz, Economics Professor Kamran Dadkhah, Associate Professor of Chemistry Tom Gilbert (a program committee member), Institute Staff Scientist Leo Sakharov and Chemistry doctoral candidate Jun Chen. Institute Associate Director Bill Giessen coordinates the Group. The doctoral program is shared academically between the Chemistry and Economics Departments, with Chemistry as the Registering Department and our closest partner. Three more doctoral students will join our ranks through Chemistry this Summer and Fall.

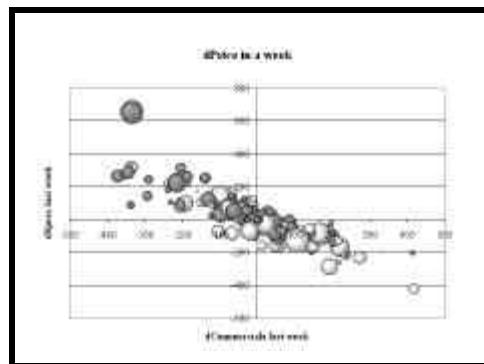
Conceptually, our work is based on the growing insight among economists and market participants that the “efficient market” model underlying most economic analysis is flawed. This model assumes that markets have perfect information and can therefore only make random moves based on randomly arriving information. In fact, most market behavior is (to say the least) not based on complete information, as seen in current stock price movements.

The CMDA group approaches markets primarily technically, that is by registering and classifying data patterns. However, fundamental economic supply and demand criteria are also considered. While our emphasis to date is on short-term patterns and forecasts, longer-term trend analysis is also of great interest.

Future sequels to this note will discuss specific methods used in greater detail. For now the Figure shows one plot as a paradigm. In this study, the changes of the net market positions (long or short) of different groups of market participants are plotted and evaluated with respect to their predictive qualities. We focus on commercials and large specs that generally hold mutually offsetting and hence strongly negatively correlated positions. The variable is the sign of the price change of petroleum for a specific advance period. The size of circles corresponds to size of moves. There are preponderances of positive moves (blue circles) or negative moves (white circles) in the respective quadrants.

This preliminary result has low statistical relevance, but it illuminates some of the data evaluation concepts we are using.

We would like to hear from Gazette readers who are interested in this work. Some perhaps may wish to act as beta-testers for some of the extensive programs we have created.



HPCE 2000

Many Barnett Institute researchers and alumni presented lectures or posters at the 13th HPCE: International Symposium on Microscale Separation and Analysis Techniques at Saarbrücken, Germany in February. Dr. Karger and his administrative assistant, Beverly Brenner, gathered together many of the alumni attending the conference for a dinner in a delightful restaurant/pub in the old market section of Saarbrücken. Eighteen enjoyed the evening together and a group picture was taken; however, it was, unfortunately, too dark to print. About 12 more alumni were at the conference but unable to join us for the evening. It gives us great pride to see so many of our former graduate students, postdocs and staff scientists progressing well in their areas of expertise. HPCE 2001 will be held in Boston under the Co-Chairmanship of Dr. Karger and Dr. William Hancock of Agilent Technologies. We hope to welcome many alumni for a special get-together at that time.

JUST MARRIED!

JACQUELINE THORNE (Ph.D. '97) was married to Al Iacovella on April 29, 2000 in Doylestown, PA. Many recent Institute alumni attended. Jacqui continues at the Pharmaceutical Research Institute of the R.W. Johnson Co., Raritan, NJ. We wish Jacqui and Al much happiness.

CONGRATULATIONS!!

CHANTAL FELTEN successfully defended her thesis on February 25, 2000 at the University of the Saarlandes in Saarbrücken, Germany. Chantal, a Ph.D. student of Prof. Heinz Engelhardt (also an Institute alumnus) conducted her research as a Visiting Scientist with Dr. Karger. Her major research areas were capillary electrophoresis and electrospray mass spectrometry. Her defense coincided with the HPCE 2000 conference in Saarbrücken. In this way, Dr. Karger was a member of her committee, and several Institute personnel and alumni attended – Marie Ruiz-Martinez, Jacqueline Thorne, Kim Greve, Frank Hafner and Beverly Brenner. All witnessed the interesting custom of making a hat decorated with memorabilia and interests of the Ph.D. graduate, and they presented Chantal with her hat after the defense. Chantal will continue her research in Dr. Karger's laboratory as a Visiting Scientist until October, 2000, when she will join Genentech, Inc. in San Francisco as a Research Scientist.

MAREK MINARIK successfully defended his thesis on May 15, 2000. His thesis title is Development of Instrumentation and Technology for Micropreparative Capillary Electrophoresis and Its Application to Bioanalysis. Marek completed his research with Dr. Karger. He is now a Research Scientist at Molecular Dynamics, Inc., Sunnyvale, California, along with Institute alumni Shaorong Liu, Rob Nelson and Oscar Salas-Solano.

ALUMNI TRANSITIONS

JOHN P. BARRY presently is Senior Scientist in Drug Metabolism and Pharmacokinetics at Boehringer Ingelheim Pharmaceuticals, Inc., Ridgefield, CT. John received his Ph.D. with Prof. Paul Vouros several years ago. He is married to Institute alumna Dr. Marie Ruiz-Martinez, who is a Senior Scientist at CuraGen Corp., New Haven, CT.

ALEXEI BELENKY recently became a Senior Scientist at Cetek Corporation, Marlborough, MA. Alexei was a Postdoctoral Fellow in Dr. Karger's laboratory about ten years ago.

DANIEL KIRBY is now Senior Scientist in Analytical Chemistry at Praecis Pharmaceuticals, Inc., Cambridge, MA. Dan was a Staff Scientist in Prof. Paul Vouros' lab between 1990-1997.

YELENA LYUBARSKAYA has joined PE Biosystems in Framingham, MA as a Product Applications Specialist. She received her Ph.D. in 1998 after studying with Dr. Karger.

PAUL JEDRZEJEWSKI, a Staff Scientist in Dr. Karger's laboratory, joined Zyomyx, Inc., Hayward, CA in January.

WELCOME!!

Two researchers recently have joined Dr. Karger's laboratory – Dr. Eugene Moskovets as a Principal Research Scientist and Dr. Hui He as a Postdoctoral Research Associate. Two others will be starting their research in June – Dr. Maria Iuliana Lazar as a Principal Research Scientist and the 2000-2001 Hatsopoulos Scholar and Dr. Alexander Ivanov as a Postdoctoral Research Associate.

EUGENE MOSKOVETS brings his broad knowledge in the areas of lasers and laser spectroscopy to Dr. Karger's lab. He received his Ph.D. from the Department of Laser Spectroscopy of the Institute for Spectroscopy, Russian Academy of Sciences, Troitsk, Russia. In the U.S. he has worked in laboratories of the Department of Physics at Union College, Schenectady, New York, the Dept. of Chemistry and Biochemistry at Texas Tech University, Lubbock and the Chemistry Department at George Washington University. He has collaborated with Science and Engineering Services, Inc. on the design and testing of a mass spectrometer with delayed extraction for IR-MALDI analysis.

HUI HE recently completed his Ph.D. studies in Analytical Chemistry at Duke University with Prof. Linda McGown. His expertise is in the areas of spectroscopic technologies and chemical separations using capillary electrophoresis. He will join the Genomics Research Group of Dr. Karger's laboratory.

IULIANA M. LAZAR received her Ph.D. in Analytical Chemistry in 1997 from Brigham Young University. Since that time, she has achieved extensive experience in instrument and method development for microchip-MS, TOFMS, ESI, APCI, CE-MS, HPLC-MS, GC-MS, SFC-MS as a Postdoctoral Research Associate at Sensar Larson-Davis Co. and more recently at the Oak Ridge National Laboratory under Dr. Mike Ramsey. She will be involved in proteomics and microfabricated devices research in Dr. Karger's laboratory.

ALEXANDER IVANOV recently received his Ph.D. from Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry in Russia. His research experience has been in micro-analytical methodologies, HPCE, MS and protein-peptide sequencing. Alexander will be performing research in high throughput mass spectrometric systems for the study of the proteome in Dr. Karger's laboratory.

In September the Barnett Institute welcomed several new Ph. D. students. Anna Pashkova has come from Kiev, Ukraine to study with Prof. Karger and Jimmy Flarakos from Canada will start his research with Prof. Paul Vouros, as also will Elaine Ricicki from Muhlenberg University, PA.

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UPCOMING EVENTS

October 3, 2000:

University Lecture

Dr. David Ellis, President

Boston Museum of Science

November 1, 2000:

Dieter and Inge Hoehn Lectures in

Bioanalytical Chemistry

Topic:

Proteomics

Dr. John R. Yates

Director of Protein and

Metabolite Dynamics

Novartis Agricultural

Discovery Institute, Inc.

San Diego, CA

Dr. Leigh Anderson

President and CEO

Large Scale Proteomics Corp.

Rockville, MD

November 2, 2000:

Advisory Council Meeting

December 5, 2000:

Lecture

Professor David Walt

Tufts University

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