CONTACT: JOAN STEVENSON (SEE P4)

April, 2004

Volume 9, Issue 2

# AES Newsletter


Inside this issue:



**Many thanks to our Sponsors for contributions funding the 2003 meeting.**

**Genencor International**

**Amersham Biosciences**

**Bio-Rad Laboratories**

**CombiSep**

**Owl Scientific**

**Dr Sheldon Engelhorn**

**California Separation Society**

**Our traditionally strong meetings, with sessions chaired by invited plenary speakers discussing state-of-the-art topics, would simply not be possible without funding from sponsors. These donations are greatly appreciated.**

## Yahoo! Call for papers for the next AES meeting in Austin, Texas - November 7-12, 2004!

Dr. Annelise Barron, our 2004 meeting organizer, has pulled together a strong meeting detailed on the followed pages. **The deadline is May 1, 2004 for abstracts of talks and July 1 for late-breaking abstracts.** Abstracts received after May 1 will be assigned to posters. But note that this year the posters will be up for 3 days of the meeting (Monday through Wednesday) so there will be ample time for viewing.

To submit an abstract (also called PTP for proposal to present) go to: http://www.aiche.org/annualapp/ Sign up to get a password and then log on. Enter the names of the authors and copy your abstract into the appropriate space. After May 1 submit to Joan Stevenson joansteveson@comcast.net by email.

**In general, submit:**

- Novel protein analysis and protein array abstracts to TD001.
- 2D and mass spectrometry related abstracts to sessions TD002 or TD003.
- Microfluidic chips abstracts with biomedical applications to session TD005 or TD006.
- CE and microchannel DNA separation abstracts to sessions TD007 or TD008.
- Electrokinetics abstracts to TD009.
- Bioinformatic abstracts to T2003 or 4.

But of course read the session descriptions and email the session chair with questions about submissions.

**Some Austin Information:** The average November temperature is 70 degrees high and 49 degrees low. The Austin Convention Center covers six city blocks with five Exhibit Halls, 54 meeting rooms, and two ballrooms so t*here will be sufficient room this year.* Austin, the state capital, has a plethora of good restaurants. The University of Texas at Austin is a major research university, home to more than 48,000 students and 2,700 faculty.

Sessions are described on the following pages:

## TD001 - Frontiers in Proteomics

Proteomic analysis represents a powerful approach to understanding the global response of cells, tissues and organisms to stimuli or mutations. Although current methods are very powerful, important limitations remain in terms of the sensitivity, throughput and quantitation of complex samples. New technologies are required to attack some of these issues. This session will focus on the development of novel techniques to address the limitations of current technology. These will include ultra-sensitive protein detection, high-throughput antibody creation and optimization, the development of protein-detecting microarrays and several other topics.

**Chair:** Thomas Kodadek
UT Southwestern Medical Center
Dept. of Internal Medicine, Dallas, TX
Thomas.Kodadek@utsouthwestern.edu

**Vice-Chair:** George Georgiou
UT at Austin
Dept. of Chem Eng., Austin, TX
gg@che.utexas.edu

## TD002 - The State of the Art in Proteome Analysis

This session will focus on the development of proteomic technologies and their application to biotechnology. Of particular interest are papers describing advances in gel-free protein separations, novel protein stains, methods of analyzing membrane proteins, and mass spectroscopic methods for resolving peptide mixtures. Papers are also sought on the application of proteomics to the study of bacterial, animal, and plant cell cultures, and especially proteomic analysis of post-translational modifications.

**Chair:** Kenneth Reardon
Colorado State University
Department of Chemical Eng.
Fort Collins, CO 80523-1370
reardon@engr.colostate.edu

**Vice-Chair:** Phillip Wright
University of Sheffield
Biological & Env. Systems Grp
Sheffield, United Kingdom
p.c.wright@sheffield.ac.uk

## TD003 - Biomedical Applications of Proteomic Technologies

Proteomics offers biomedical researchers powerful new approaches to globally investigate the molecular basis of disease, drug action, and development. A proteomics approach, identifying protein targets associated with various diseases, can ultimately provide a basis for the rational design of pharmacological interventions. This session will especially explore novel applications of electrophoretic, chromatographic, immunologic, and mass spectrometric technologies to analyze proteomes for ultimate clinical benefit.

Chair: Alex Kurosky
UT Medical Branch
Biological Chem & Genetics
Galveston, TX
akurosky@utmb.edu

Vice-Chair: Larry Denner
UT Medical Branch
Internal Medicine Dept
Galveston, TX
ladenner@utmb.edu

## TD004 - AES Plenary Speaker Speaker: TBD

**Chair:** Vassily Hatzimanikatis
Northwestern University
vassily@northwestern.edu

**Vice-Chair:** Annelise Barron
Northwestern University
a-barron@northwestern.edu

## TD005 - Microfluidic Chips for Biomedical Applications

Medical diagnostic kits encompass a wide variety of portable analytical devices used to monitor and screen for medical conditions. They are rapidly being developed for use on a single-test basis and show promise as indispensable tools for clinical research, medical laboratories, and at home self-testing. The terms “microdevice,” “microchip,” “lab-on-a-chip,” and “micro-electromechanical systems” all refer to small, versatile, inexpensive, rapid-response devices that may be engineered for biomedical applications. Research in the areas of sample introduction, preparation, electrokinetic transport of biofluids, development of quantitative detection sensors, and the incorporation of genomic and proteomic biomarkers are needed to further the advancement of biomedical microdevices. Novel microanalytical tools are welcome, specifically those impacting applications such as genetic predisposition testing,

*Cont. next page*

diagnosis of the presence of a particular disease or disorder, or those monitoring the efficacy of drug therapies. The goals of this session are to bring together researchers from academia, research labs, and industry to exchange ideas with the potential to revolutionize medical diagnostics. In particular, this session seeks contributions in the field of biomedical microdevices on either the cellular or subcellular level. Subjects of interest include cellular analysis in microdevices; development and fabrication of innovative devices; novel biofluid separators; advances in microanalytical systems; electrokinetics; dielectrophoresis; advances in chemical, electrochemical, and optical in-line sensor technology; and novel low concentration detection in capillary electrophoresis systems.

**Chair:** Adrienne Minerick
Mississippi State University
School of Chem Engineering
Mississippi State, MS
minerick@che.msstate.edu

**Vice-Chair:** Rebecca Zangmeister
Natl Inst. Stds & Technology
Chemical Science and Tech Lab
Gaithersburg, MD
razang@nist.gov

## TD006 - Microfluidic Chips for Proteome Analysis

Microfluidic technology holds the promise of enabling novel, more efficient, and higher throughput proteomic and genomic analyses. As products based on microfluidics are introduced commercially, the promise is becoming a reality. This session seeks papers on chip-based novel methods for proteomic analysis, including electrokinetic approaches in 1D and 2D, and microfluidic interface with electrospray mass spectrometry .

**Chair:** Andrea Chow
Caliper Technologies Corp.
Mountain View, CA 94043
andrea.chow@calipertech.com

**Vice-Chair:** Steve Jacobson
Department of Chemistry
Bloomington, IN 47405
jacobson@indiana.edu

## TD007 - Genomic Assays in Microchannel Electrophoresis Systems

DNA electrophoresis in capillary and microchannel geometries continues to be a key enabling technology in modern genomic analysis applications. Ongoing efforts to achieve enhanced DNA separation performance in microchannel electrophoresis systems promise to enable the production of microfabricated devices capable of operating in a low-power and portable format. In order to meet future societal needs for increased throughput of genomic analysis at reduced cost, considerable room for progress exists both in the design of new devices and in the development of improved sieving media based on polymeric, non-polymeric, and nanofabricated structures. Novel techniques to analyze DNA and proteins by directly probing the motion of single molecules either through nanoscale fluidic channels or through membrane channel nanopores also show great promise. Chemical engineers continue to make important contributions in these areas, and we invite abstracts related to any aspect of the development or study of DNA separation technology or genomic assays at the microscale.

**Chair:** Victor Ugaz
Texas A&M University
3122 TAMU
College Station, TX 77843
ugaz@tamu.edu

**Vice-Chair:** Annelise Barron
Northwestern University
Chemical Engineering Dept
Evanston, IL 60208-3120
a-barron@northwestern.edu

## TD008 - Electrophoretic Biomolecule Analysis on Microfluidic Platforms

Electrophoresis continues to be an integral tool for the analysis of DNA and proteins in both basic biology and medicine, which is now being translated onto microfluidic devices. The ultimate challenge for technology developments associated with electrophoresis on microdevices is to increase throughput, through a high degree of parallelization, and to reduce development time without sacrificing peak capacity. This session will focus on technical aspects of the development of novel microfluidic platforms for the efficient separation of DNA, proteins, and other biomolecules. In addition, we welcome contributions focused on aspects of microfluidic transport in these devices, including simulation and modeling studies in these systems, materials modification to improve system performance, and novel sample preparation protocols.

**Chair:** Steven Soper
Louisiana State Univ.
Chemistry Dept
Baton Rouge, LA
chsope@lsu.edu

**Vice-Chair:** Don Devoe
University of Maryland
Mechanical Eng Dept
College Park, MD

*Cont. next page*

Contact: Joan

Joan Stevenson
Executive Director
The Electrophoresis Society
3338 Carlyle Terrace
Lafayette, CA 94549 USA

Phone: 925-284-7186
Fax: 925-283-5621
joanstevenson@comcast.net
Web: www.aesociety.org

**Electrophoresis past, present and future**


Annelise Barron, our meeting organizer, is productive in many ways! The AES welcomes her new baby, Katrin Elizabeth, HS class of 2022.

## TD009 - Electrokinetics and Microfluidics

Electrokinetics and microfluidics play a substantive role in a spectrum of technologies that ranges, for example, from nanoparticle characterization and directed electronics assembly to biosensors and DNA sequencing. This joint session of the AES/AIChE will explore advances in microfluidics and electrokinetics, from both the fundamental and applied perspectives. Suitable topics include: microfluidic networks and their applications (including mixing, reaction, separations, or transport processes); complex particles and surfaces (nanoparticles, heterogeneous particles, biological cells, soft particles); electrokinetically-directed assembly; electrokinetic effects in non-polar media; novel applications of electrokinetic phenomena (biosensors, displays, environmental or chemical assays); and novel measurement techniques (electrophoretic mobility, charge nonuniformity, forces, electro-acoustics, electro-optics.)

**Chair:** James Baygents
University of Arizona
Chemical Eng. Dept
Tucson, AZ
jcb@maxwell.che.arizona.edu

**Vice Chair:** Darell Velegol
Penn State University
Chemical Eng. Dept
University Park, PA
velegol@psu.edu

# Sessions Co-sponsored with AIChE:

## T2003 - Bioinformatics III: Focus on Transcriptomics

Biological sciences and every field in biotechnology are experiencing an ongoing revolution. It is an information revolution driven by advances in analytical technology, biochemistry, nanotechnology, polymer chemistry, and material science. These technologies enable the precise and quantitative characterization of the various molecules within a cell and the monitoring of many cellular processes simultaneously. This revolution in biology offers two main challenges to chemical engineers: contribution to technology development and meaningful analysis of the large-scale information generated by these technologies. In this session, invited speakers will discuss principles and applications of transcriptomics.

**Chair:** Kelvin Lee
Cornell University
Ithaca, NY 14853-5201
khlee@cheme.cornell.edu

**Vice-Chair:** Kenneth Reardon
Colorado State University
Fort Collins, CO 80523-1370
reardon@engr.colostate.edu

## T2004 - Bioinformatics IV: Focus on Proteomics

Biological sciences and every field in biotechnology are experiencing an ongoing revolution. It is an information revolution driven by advances in analytical technology, biochemistry, nanotechnology, polymer chemistry, and material science. These technologies enable the precise and quantitative characterization of the various molecules within a cell and the monitoring of many cellular processes simultaneously. This revolution in biology offers two main challenges to chemical engineers: contribution to technology development and meaningful analysis of the large-scale information generated by these technologies. In this session, invited speakers will discuss principles and applications of proteomics.

**Chair:** Alfred Gaertner
Genencor International, Inc.
Palo Alto, CA 94304
agaertner@genencor.com

**Vice-Chair:**
Vassily Hatzimanikatis
Northwestern University
vassily@northwestern.edu