



AES NEWSLETTER



Inside this issue:

Session Descriptions	2-4
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Call for Papers! for the annual meeting of the American Electrophoresis Society in Salt Lake City, November 4-9, 2007

The American Electrophoresis Society (AES), in association with the American Institute of Chemical Engineers (AIChE), is soliciting oral and poster presentation abstracts for the 2007 Annual Meeting. The technological capabilities of electrophoresis continue to progress and this symposium will highlight ongoing advancements in the field. Electrophoretic separation of nucleic acids has served as a dominant technology in the molecular genetics toolkit for nearly half a century, yet advancements on theoretical and empirical approaches to express the mobility of various macromolecules are still ongoing. 2D gel electrophoresis continues to dominate high resolution separations in the proteomics realm, but development of proteomic subfractionation techniques and their integration with advanced detection technologies is currently the focus of most innovators, spurred on by the incredible complexity of the human proteome. On-line multidimensional liquid chromatography and capillary electrophoresis systems are also becoming standard technologies in proteomics and genomics. The coupling of electrophoresis with mass spectrometry has provided powerful approaches for rapid identification and structural characterization of analytes. Microchip capillary electrophoresis devices are gaining in popularity due to their ability to perform fast, highly efficient separations with small volume samples.

The overall goal of this conference is to provide a forum for the discussion of recent developments in electrophoretic separations technologies relevant to the analysis of cells, proteins, nucleotides and small molecules. Investigators are encouraged to submit abstracts for this meeting through the link on the AES web page, www.aesociety.org. The deadline for abstract submission for oral or poster presentation is Monday, May 14, 2007.

Many thanks to our Sponsors for contributions.

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

We also thank NIH for travel grant support.



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AES 2007 Meeting Co-Chairs

AES MEETING PROGRAM: Descriptions of the 14 sessions of Topical 3 follow to help members pick the best match for their talk or poster.

AES Plenary Session: The objective of the AES Plenary Session is to highlight significant contributions to the society that have occurred over the past five years. Overviews of research are sought (invited talks).

Biomems and Microfluidics: Biomedical Diagnostics: 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. The terms “microdevice,” “microchip,” “lab-on-a-chip,” and “micro-electromechanical systems” all refer to small, 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 detection sensors, and the incorporation of biomarkers are needed to further the advancement of biomedical microdevices. Novel microanalytical tools are welcome, particularly those impacting genetic predisposition testing, rapid 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.



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CoChair: Bruce Gale
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Biomems and Microfluidics: Sensing, Detection, and Integration: Remarkable progress has been made to fabricate micro-scale and nanoscale devices for the detection and manipulation of biological cells and molecules. Furthermore, devices with different functions and of different materials have been integrated to form microscale and nanoscale systems for complex procedures. In this session, we invite contributions dealing with any aspects of micro/nanoscale sensors and actuators with biological applications. The topics of interest include but are not limited to immunosensors, electrochemical sensors, and various spectroscopic and separation tools in a microchip format. We are particularly interested in papers dealing with micro/nano scale systems and issues related to integration. Both experimental and theoretical contributions are welcome.



Chair: Chang Lu
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Advances in Electrokinetics and Electrophoresis - Particles and Biomolecules: Electrokinetic techniques continue to play a leading role in technologies ranging from nanoparticle characterization and directed electronics assembly to micropumps and micromixers to biosensors and DNA sequencing. In this session, we invite submissions related to the development of new technologies in any of these areas, from both the fundamental and applied perspectives. Suitable topics include: microfluidic networks and their applications (including mixing, reaction, separation, 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).



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Advances in Proteomics: New Technologies I: Studies of gene expression patterns play a vital role in understanding the complex interactions associated with cells, tissues, and organisms responding to stimuli or mutations. While recent developments have allowed these patterns to be investigated at an unprecedented level of detail, further advances are needed. Specifically, new technologies are needed with the capability of providing quantitative information with greatly enhanced levels of sensitivity and throughput. 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, high-throughput antibody creation and optimization, the development of protein –detecting microarrays, and other related technologies. Papers are also sought that present research on the

application of proteomics to the study of bacterial, animal, and plant cell cultures, and especially proteomic analysis of post-translational modifications.



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CoChair: Mark Lim
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Advances in Proteomics: New Technologies II: This session is an extension of the previous one and will focus on the development of new proteomic technologies for the purpose of understanding complex intracellular mechanisms. Of particular interest are papers describing advances in phosphoprotein and membrane protein analysis, especially those involving mass spectrometry methods and novel microarrays.



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CoChair: Timothy Haystead
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AES Poster Session: Submissions are invited that describe new experimental or theoretical work involving any aspect of electrophoresis at both the macro- and micro-scales. **Although submission by May 14 is required to make the AIChE abstract booklet, the AES accepts late-breaking poster abstracts until October 1, 2007.** Regular and late breaking abstracts are compiled in a booklet that is handed out at the meeting and later uploaded onto the AES web site. Send poster abstracts to **Chair: Joe Biernacki**, Tennessee Tech, jbiernacki@tntech.edu; or **CoChair: Nancy Kendrick**, Kendrick Labs, nancy@kendricklabs.com.

Advances in CE and Microdevice Technology for Genomic Analysis Microfluidic-based DNA and protein separation systems are beginning to appear as commercially available products for use in a variety of applications. If sufficient miniaturization can be achieved, these microdevices will enjoy a tremendous cost advantage over today's systems, and play a central role in future efforts such as the goal of sequencing a genome for \$1,000 or less. Strategies to improve sieving media based on a variety of materials incorporating uniform, reproducible microstructures promise to generate tremendous improvements in the level of performance. In addition, separation matrices composed of nano-structures constructed directly on the surfaces of silicon, glass, and plastic substrates offer exciting possibilities in terms of exerting precise control over pore size and sieving properties. Novel techniques to analyze DNA and proteins by directly probing the motion of single molecules through nanoscale fluidic channels or membrane channel nanopores also show enormous potential. We invite abstracts related to any aspect of the development or study of biomolecule separation technology at the microscale, or on miniaturized devices.



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CoChair: Kevin Dorfman
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Biomems and Microfluidics - Novel Applications: Biological microsystems and microfluidic devices have developed significantly in recent years. Many of these systems have evolved beyond the technology development stage into applications in clinical and commercial areas. While the traditional application areas have primarily been within the realms of diagnostics and sensing, these technologies have advanced into other areas such as cell separation, platforms for tissue engineering, platforms to study stem cell behavior, implantable prosthetic devices, and drug delivery systems, to name only a few. This session aims to bring together researchers from academia, industry, and government working in a broad spectrum of novel application areas.



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CoChair: Milica Radisic
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Advances in Electrokinetics and Electrophoresis - DNA Applications: Electrokinetic techniques play a leading role in technologies ranging from nanoparticle characterization and directed electronics assembly to micropumps and micromixers to biosensors and DNA sequencing. We invite submissions related to new technologies in any of these areas. Suitable topics include: microfluidic networks (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

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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).



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Co-chair: **Malgorzata Witek**
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Biomems and Microfluidics: Proteome Analysis: Microfluidic technology holds the promise of enabling novel, more efficient, and higher throughput proteomic and genomic analyses in a low-power portable format. This session seeks papers on chip-based novel methods for proteomic analysis including sample preparation, electrokinetic approaches in 1D and 2D, and microfluidic interfaces with downstream analytical instrumentation (e.g., mass spectrometry).



Chair: **Mario A. Oyanader**
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Biomems and Microfluidics: Cell and Biomolecule Analysis: Electrophoresis continues to be an integral tool for the analysis of biomolecules in biology and medicine, and is now being adapted to the microfluidic devices. The ability to study processes at the single-cell level promises to provide a host of information with benefits in the area of therapeutics and drug discovery. In this session, we invite papers describing microfluidic technology to probe chemical and biochemical responses at the cellular and sub-cellular levels. In addition, we welcome contributions focused on any related aspects including simulation and modeling studies, materials modification to improve system performance, and novel sample preparation protocols.



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CoChair: **Siva Vanapalli**
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Advances in Electrokinetics and Electrophoresis - Fundamentals: Electrokinetics involves the use of electrical fields to produce motion of colloidal particles within a medium that could be either fluid, porous or fibrous. Notable applications include those related to environmental processes such as soil decontamination, drinking water purification and the decontamination of industrial effluents. Electrostatics aspects of membrane-based separation processes is another excellent example. A detailed analysis of particle-to-particle electrostatics forces, including experimental measurements and computer-based simulations are relevant for advances involving electrokinetics principles. Contributions with novel approaches related to fundamental principles, modeling, and experimental studies will be welcome as well as experimental work describing new and novel aspects of electrokinetics and also theories and computational efforts helping to improve understanding of outstanding fundamental problems.



Chair: **Pedro Arce**
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CoChair: **Sharon Sauer**
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T3000 Field Trip to the Center of Excellence for Biomedical Microfluidics at the University of Utah: Our Center is dedicated to the discovery, understanding, development, and commercialization of microscale and MEMS devices for application to biological, biomedical, and medical problems. Come along on the field trip and see what we're about. Contact either **Bruce Gale**, gale@eng.utah.edu or **Niel Crews**, engineeringcrews@yahoo.com to reserve a slot.

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Check
out:

**BioMEMS and Electrophoresis in 2006:
Review of the 23rd Annual Meeting of
the American Electrophoresis Society**

By Adrienne Minerick and Victor Ugaz

In: *Biomicrofluidics* vol 1, 2007

