

Preface to Special Topic: Papers from the 2006 Annual Meeting of the American Electrophoresis Society, San Francisco, CA

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This Special Topic section of *Biomicrofluidics* is dedicated to original papers from the 2006 Annual Meeting of the American Electrophoresis Society (AES: <http://www.aesociety.org>). This five-day meeting held in San Francisco, California, included five sessions on BioMEMS and Microfluidics and four sessions on Advances in Electrokinetics and Electrophoresis. AES and its corresponding symposia provide the most focused and well-organized meeting forum for diverse biological and engineering researchers working on electrokinetics. The work featured in this Special Topic section is no exception; it ranges from nanochannel electrophoresis to bioparticle sorting. © 2007 American Institute of Physics.

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It is our pleasure to present a selection of papers highlighting some of the outstanding work presented at the recent 2006 symposia of the American Electrophoresis Society (AES), held 12–17 November 2006 in San Francisco, California. The AES symposia takes place every year in conjunction with the annual meeting of the American Institute for Chemical Engineers (AIChE). By bringing researchers from diverse academic and industrial backgrounds together with AIChE's engineering-based membership, a truly unique format is created that enables cross fertilization of ideas, forging of new professional interactions, and catalyzing of new interdisciplinary collaborations.

AES is a professional society dedicated to the theoretical and practical development of electrokinetic technologies including those using gels, capillaries, and microfluidic chips. The Society was founded in 1973 to promote excellence in science and techniques across all disciplines, and is run by a dedicated group of volunteers from biology departments, medical schools, engineering departments, and the biotech industry. No other U.S. organization is more focused on the important fields of electrokinetics and electrophoresis, which are key components of many genomic analysis assays. This year's meeting featured a look toward the future, with an emphasis on theoretical and experimental advances in bio-MEMS and microfluidic technologies. These breakthroughs are already playing a central role in enabling the development of next-generation bio-analytical devices. The particularly diverse nature of this year's program, including sessions in the areas of cellular, genomic, and proteomic analysis, makes it a natural fit with the scope of *Biomicrofluidics*—a journal aimed at a similarly diverse readership.

The plenary sessions have always been a high point of the AES symposia, and 2006 proved to be no exception. This year, four plenary speakers joined us representing a cross section of the current state-of-the-art in the field. Contributions in the bio-MEMS area included a talk on “Ultrafast Electrophoresis at the Nanoscale using Atomic Force Microscopy” by National Academy of Engineering member, Dr. H. Kumar Wickramasinghe, who was at the IBM Almaden Research Center prior to becoming The Henry Samueli Endowed Chair at University of California, Irvine.

Dr. Robin H. Liu from CombiMatrix Corp spoke on “Integrated Microfluidic and ElectraSense Microarray Biochips for DNA Analysis,” while Dr. Paul Bohn from the University of Notre Dame enthralled the audience with “Nanofluidics and Mass-Limited Chemical Analysis: Nanocapillary Array Membranes as Switchable Fluidic Elements for Multidimensional Analyses.” In conclusion, Dr. Larry Grossman captured the attention of everyone with “Automated Computational Analysis of Molecular Evolution: Mitochondrial ATP Synthase in Primates and Other Mammals.”

Selecting only a few representative papers from such an outstanding program proved to be a particularly daunting task, but we hope that this Special Topic section captures a few highlights of the 2006 AES Symposia. A meeting review by Adrienne Minerick and Victor Ugaz is included, along with the following contributions:

- Enid N. Gatimu, Travis L. King, Jonathan V. Sweedler, and Paul W. Bohn on “Three-dimensional integrated microfluidic architectures enabled through electrically switchable nanocapillary array membranes;”
- I-Fang Cheng, Hsien-Chang Chang, Diana Hou, and Hsueh-Chia Chang entitled, “An integrated dielectrophoretic chip for continuous bioparticle filtering, focusing, sorting, trapping, and detecting.”

We would like to extend special thanks to the National Institutes of Health (NIBIB), and in particular, Dr. Brenda Korte, for providing funding that allowed us to award expense grants to a selection of truly outstanding student and postdoctoral presenters at the Symposia. These kinds of awards play an instrumental role in helping to prepare the next generation of scientists and researchers to tackle new problems in cutting edge areas. We are also grateful to Professor Hsueh-Chia Chang for generously offering us the opportunity to share a sampling of our technical program with the readers of *Biomicrofluidics*. If you like what you see, we hope you will consider joining us at the 2007 AES Symposia to be held 4–9 November 2007 in Salt Lake City, Utah. A summary of the 2006 technical program and related information can be found on the AES website (<http://www.aesociety.org>) and the AIChE website (<http://www.aiche.org>).