March 31, 2003

Volume 8, Issue 1

AES Newsletter

Electrophoresis: Beyond Genomics

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American Electrophoresis Society 2003 Meeting

CALL FOR PAPERS

November 16-20, 2003
San Francisco Hilton

Abstract deadlines:

- **May 1 to be in the AIChE program**
- **July 1 for late breaking Abstracts (submit to our website.)**

For information go to www.aesociety.org

Submit abstracts (PTPs) at www.aiche.org/annualapp

The AES, in association with AIChE (American Institute of Chemical Engineers), invites submission of abstracts on applications and methodology of electrophoresis and electrokinetics, including proteomics, electrokinetics remediation and microchip separations.

To find the names of the sessions click on the link in the upper left corner called "Sessions Offered at this Meeting." The AES sessions are listed under category T3. When you have identified an appropriate session for your presentation, sign in, register, and submit your abstract.

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Thanks to our Corporate Sponsors:

- Amersham Biosciences
- Bio-Rad Laboratories
- Genencor Intnl Inc
- Kendrick Labs Inc
- NonLinear USA Inc
- Definiens AG

Preview of our 20th Anniversary Meeting — San Francisco 2003

This year's meeting will be bigger and better than the last! Once again this year we are broadening the scope of the annual meeting with sessions covering non-traditional topics. The underlying theme of the meeting remains as the role of electrophoresis in proteomics and genomics, since these are now the principal uses of the technology. Thus, both old and new methods for electrophoresis will be covered from both theoretical and practical points of view. In addition, the important role of computers in data analysis and management will be covered in sessions on bioinformatics. This year, for the first time, we will gather all of the session chairs together as a panel in an open forum to provide in-depth answers to questions from the audience.

As in the past two years, this year's meeting is being held in conjunction with the annual meeting of the American Institute of Chemical Engineers (AIChE). The 2003 Joint Meeting will be held in San Francisco, California, from Sunday, November 16 through Thursday, November 20. Meeting headquarters are the San Francisco Hilton Hotel and all of the sessions of the AES Meeting will be held there. The blending of the two meetings has worked well to cross-fertilize the mutual fields of interest and this year should be no different.

The first day of the meeting, **Sunday, November 16**, will feature three AES workshops on two-dimensional polyacrylamide gel electrophoresis. ***Morning:*** New Techniques in 2D Electrophoresis, featuring five 25 min talks about the newest breakthroughs in 2D technology. Refreshments will be provided. Watch our web site for speakers and topics. ***Early Afternoon:*** Demonstration of IPG strip technique by Amersham Biosciences. They can't do a full 2D run in 2 hours but will show the basics and answer questions. ***Late Afternoon:*** Bioinformatics Demonstration by BioRad Labs. The speaker will discuss computerized analysis of 2D gels and give examples of handling the data.

Formal presentations begin on **Monday, November 17** with two sessions on Bioinformatics in Functional Genomics and a session on the Principles and Practice of Applied Electrokinetics. This sessions are co-sponsored by AIChE and AES.

Poster presentations begin on Monday the 17th and the posters will remain on display through Tuesday the 18th. As was done last year, a committee will award prizes for the best posters.

Tuesday, November 18 brings sessions on New Applications and Technologies in Proteomics.

Wednesday, November 19, Day Four of the meeting, has sessions scheduled covering New Tools, Techniques and Protocols for Genomics and Proteomics and also Emerging Technologies in Electrokinetic Separations.

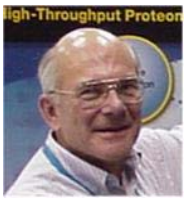
An Open Forum Question and Answer Session closes out Day Four. The meeting will end at about lunchtime on **Thursday, November 20**, following a final session on Industrial Applications of Electrokinetic Technologies. As always, the key manufacturers of supplies for electrophoresis will have their products on display in the Exhibits Hall.

An outstanding group of scientists have agreed to serve as Session Chairs. All are recognized experts in their fields and are sure to select interesting speakers for their sessions.

San Francisco is sometimes called "everyone's favorite city." It is renowned for its fine restaurants, museums, historical places, and scenery. The San Francisco Bay area is home to world famous universities, biotechnology firms, and manufacturing facilities. The AES Banquet on Tuesday evening will be at the Empress of China Restaurant in the middle of Chinatown. Joan says the Empress is "very San Francisco" and that the view from the private room is lovely. It is safe to say that the banquet will provide great food, an interesting speaker, and lively camaraderie.

The schedule of sessions is shown on the enclosed chart. See you there!

Neil Ivory



Dave Garfin

Conference Co-Chairs for 2003

What is Electrokinetics?

The term " electrokinetics" refers to the motion of small particles in fluids induced by an electrical field. Four basic phenomena constitute the domain of electrokinetics: Electrophoresis, electroosmosis, sedimentation potential and streaming potential. *Electrophoresis* is the motion of charged particles by an applied electrical field, *electroosmosis* is the flow induced by a charged surface when a fluid moves over it, *sedimentation potential* appears when charged particles move relative to a charged surface. This potential opposes the mechanical transfer of charge leading to ion diffusion and (to a lesser extent) electroosmosis. The transfer of charge due to these two

types of mechanisms is called leak current. At equilibrium conditions between the leak current and the streaming current, one can measured the *streaming potential.* The sizes of particles involved in electrokinetic phenomena vary but they are generally small, ranging from a few fractions of a micron (ions) up to a few microns (bacteria, pollen, macromolecules).

Electrophoresis is the most widely-known member of the electrokinetics family. Recently, however, *electrokinetic remediation* (ER), a novel technique to remove contaminates from polluted soils, and also *microfluidics,* have attracted the attention of scientists and engineers. ER is applied in different designs but the "lasagna" with both vertical and horizontal modes is a typical one, with high cleaning efficiency. The fact that an electrical field is present may lead to heat effects known as the Joule phenomena. This, in turn, may yield buoyancy effects inside the domain. As a result, hydrodynamic (pressure driven and buoyancy) as well as electro-assisted transport (i.e., electrosmosis) may be significant in ER. The influence of these factors is currently being investigated. Abstracts for this area should be submitted to sessions T3001 or T3009.

Microfluidics has been made possible by major advances in the microelectronic industry. Etching techniques are now available to draw different channel patterns on a surface. This, in addition to the availability of microelectrodes and novel microscopic flow visualization techniques, have paved the way to the development of separation techniques for protein and DNA in microchips. Microfluidics is also a relevant technique to processing material for the computer industry. The basics principles of electrokinetics, mainly electrophoresis and electrosmosis, play a key role in the understanding of the flow patterns in microfluidics. Abstracts for this area should be submitted to sessions T3007 or T3009.

- Pedro Arce

Pedro Arce, Chair
Chemical Engineering, Tennessee Tech

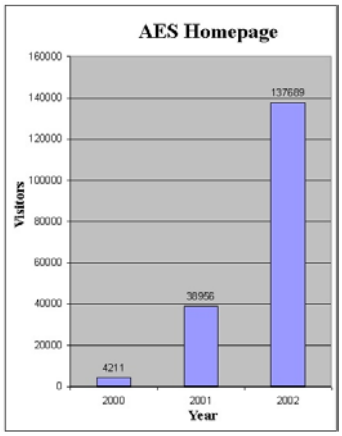
Report from our Webmaster

Dear Electrophoresis Society Members,

As current webmaster and someone whose life has been heavily involved in electrophoresis, I believe looking back on the history of the Society's website and providing you with an overview how we got where we are today may be a good starting point to discuss your current website.

The very first website was set up by Peter Lemkin (NCI/NIH, hosted on the NCI CRF servers) in the early 90s, had limited content and was rarely updated. In addition, it was known by a few insiders only. The Society started to discuss the need of an active website openly first at the 16th Annual Meeting of The Electrophoresis Society in August 1999 in Bethesda, MD. Shortly thereafter, I created the first cut for new website in spring 2000, and we went on-line on May 5, 2000. First hosted within my private web space, the society migrated quickly to its own hosting service. As space and compact design were an issue, I decided to create the original layout from the beginning in a way that could easily accomplish future expansions yet had a unified "look-&-feel" in graphics and navigation and was easy to manage. We also intended to have an eye-catching design to attract attention for the Electrophoresis Society. At launch, a skeleton of about 15 pages was introduced.

Today, the AES website contains over 100 pages of content and includes more than 1200 links. It is listed in all major search engines and has attracted a large number of international and national visitors. Our "Ask the Experts" e-mail services are used by people of all levels, affiliations and from all over the world.



The website was and is still produced with a few simple tools. All graphics were done using Jasc PaintShop Pro and self-programmed rendering tools. The meeting photographs were taken with either a digital (Sony) or conventional (Canon) camera and scanned with a low-cost scanner. HTML-coding for the pages was done "by hand" without the use of fancy editing tools. This allowed for very quick adjustments, adding and editing of navigation or functions by just using NotePad, and assured that the pages would look the same on all browsers without creating large overhead. The objectives were fast loading, appealing content and quick turnaround on updates without major programming efforts.

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ELECTROPHORESIS PAST, PRESENT AND FUTURE

Where are we today? From 813 visits through search engines (Source: Alexa site stats and traffic ranking) in 2000 to 12488 in 2001 and 46311 in 2002, traffic on our home page has increased dramatically. The site got a 5-star ("best-of-the-web") rating for the 3rd consecutive year, a 5-star speed rating ("faster than 56kb/s loading") and a great freshness rating for frequent updates as well (Source: Alexa site stats; number of votes: 40 [2000], 1807 [2001], 4094 [2002]). To show plain numbers for our home page: the total visitor counts (including repeat visits) were 4211 (2000), 38956 (2001) and 137689 (2002).

But not only has the number of visitors increased over time, people also spend more time on our site and explored the content more explicitly. On average, visitors look now at 7 pages at a single visit and stay there for 8.8 minutes - quite a time in our fast-paced lifestyles where time seems to be most precious. This probably is one of the best proofs that there is a real need for a place to look up information on electrophoresis.

One of the mostly used newer features by our web visitors in industry and academia is the meeting abstracts service. This also reflects an increase in interest in the scientific program of our meetings, and, consequently, an increase in membership. That fact became obvious to me this weekend during an update of our member database when I included the new 7-digit PIN authentication from our membership cards for the login.

Should we now be happy with our achievements and lean back? Definitely not. We have to ask ourselves: What's next? Can we claim to be a true resource for all electrophoresis techniques? Unfortunately not. For a long time I tried to assemble the techniques section on our site through contributions from experts like you. It is a shame that several areas in this section still just show the "under construction" sign. This website is all our pride. I know you can help me fill in the gaps, so I encourage everyone to send me contributions in techniques. Details of what's needed regarding content, formatting rules, etc. can be sent by e-mail quickly to those who are willing to help. My personal goal is to have not a single empty section by this summer. We also intend to create a guestbook and a questions board and provide enhanced member services. An area within our website should also be dedicated to practical advice: techniques and procedures that really work. The knowledge is out there, let's share it with those who struggle by finding out the hard way what to do and what to avoid in certain electrophoretic endeavors. Lastly, we plan start a quarterly separation contest and improve interaction with industry and academia through our "What's new in Companies" section. For all of this, your feedback is needed!

So, please make the effort, go out visiting the site thoroughly and let us all know about all your thoughts and what and how you would like to contribute. After all, it's YOUR site, and all of you will profit in the end from its usability and success.

- Erich Gombocz, Webmaster

Technical Tips:

Tech Tip #1: Increasing reproducibility with IPG strips using the Double Dip method. The "Double Dip" method - use the tweezers/forceps to position the IPG strip into the rehydration buffer and then, after the initial positioning, lift the strip up and place down again in the buffer. This repositioning allows a more uniform distribution of the buffer underneath the strip and should give more reproducible results.

Tech Tip #2: Reducing streaking for IPG strips. Use 10% glycerol or 15% isopropanol in the rehydration buffer to help combat electroendosmosis (can help reduce some streaking and allow higher voltages to be attained). This can also help with enhancing solubility of the hydrophobic proteins.

The Technical Tips were submitted by Phil Beckett and Nancy Laird from Amersham Biosciences.

Call for Volunteers:

The days of a few people dominating the society are past; we need help from everyone. Besides, it's truly fun to work with AES colleagues to bring about something larger than any single person could accomplish. Please volunteer for one of the following:

1. To be a 2004 Meeting Organizer (for Austin, TX)
2. For the Membership Drive Committee
3. To be Supervisor of the 2D Email Chat Group.

Please email nancy@kendricklabs.com to volunteer and for details. - Nancy Kendrick, President.