



# Annual Meeting of the AES Electrophoresis Society

November 17-19, 2014 @ Marriot Marquis, Atlanta, GA

THANKS to our organizers Rodrigo Martinez-Duarte and Cullen R. Buie!

visit [www.aesociety.org](http://www.aesociety.org) for a comprehensive resource on electrokinetics, microfluidics and related techniques

8:30 to 11:00 AM

## MONDAY, November 17

### Advances in Electrophoretic Protein Separation and Analysis

Marquis Ballroom C

Chairs: Tom Berkelman and Phil Beckett

8:30	Microchannel Electrophoresis for the Analysis of Amyloid Protein Oligomers – <b>C. N. Hestekin</b>
8:55	Dielectrophoretic Preconcentration and Detection of Neuropeptides at Graphene-Modified Electrodes in a Nanochannel – <b>N. Swami</b>
9:20	Human Fluid Sample Pretreatment for Biomarker Discovery – <b>F. Jahnke</b>
9:45	Quantification of 2D Gel Western Blot Overlay Images – <b>N. Kendrick</b>
10:10	Woven Fabric as a Low-cost Microfluidic Platform for Tuned Electrophoretic Separations – <b>T. Narahari</b>
10:35	Using Proteins as Resolution Probes to Quantify Gradient Insulator-based Dielectrophoresis – <b>R. Yanashima</b>

## TUESDAY, November 18

### Electrokinetics for Sample Preparation

Marquis Ballroom C

Chairs: Jörg Kutter and Stig Pedersen-Bjergaard

One-step Cell Lysis and DNA Concentration in a Multisection Insulator-Based Dielectrophoretic Device – <b>R. C. Gallo-Villanueva</b>
DEP Isolation and Detection of Cancer Related DNA Biomarkers – A Comparison of PCR and DNA Sequencing Results for Blood and Plasma – <b>M.J. Heller</b>
Exploiting Absolute Negative Mobility with Dielectrophoresis for Mitochondrial Sample Preparation – <b>A. Ros</b>
Carbon-Electrode Dielectrophoresis for Sample Preparation – <b>R. Martinez-Duarte</b>
Rapid, Specific, and Efficient Affinity Purification of Target Molecules by combining Isotachopheresis and Affinity Chromatography – <b>V. Shkolnikov</b>
Designing an Integrated Biosensing Platform for Sample-to-Answer Solution – <b>Z. Slouka</b>

## WEDNESDAY, November 19

### Electrokinetics: Advancing the Fundamentals

Marquis Ballroom C

Chairs: Aditya S. Khair and Alireza Salmazadeh

Nonlinear Electrokinetic Effects on Particle Motion Near a Microchannel Constriction – <b>Q. Wang</b>
Fundamentals of Dielectrophoretic Particle Trapping in Arrays of Insulating Structures – <b>B. Lapizco-Encinas</b>
Dielectric Decrement Effects on Nonlinear Electrophoresis of Ideally Polarizable Particles – <b>J. L. Moran</b>
Solution pH Changes in Non-uniform AC Electric Fields Above the Electrode Charging Frequency – <b>R. An</b>
Electrically Induced Hydrodynamic Interactions in Capillary Electrophoresis of Polyelectrolytes – <b>M. Arca</b>
Examining Frequency Dispersion in Non-Linear Electrokinetic Flow Using microPIV – <b>A. M. Boymelgreen</b>

11:15 - 12:15

**LUNCH WITH LEADERS \$15** (payable at door)  
@ Max Lager's Wood-Fired Grill & Brewery,  
320 Peachtree St. NE, (404) 525-4400

**Business Meeting @ Marquis Ballroom C**  
GET INVOLVED! Organizers of 2015 meeting:  
Nathan Swami [nswami@virginia.edu](mailto:nswami@virginia.edu)  
Michael P. Hughes [m.hughes@surrey.ac.uk](mailto:m.hughes@surrey.ac.uk)

Lunch on your own

12:30 – 3 PM

**Electrokinetics for Biosensing and Biomedical Applications**  
Marquis Ballroom C  
Chairs: Fatima Labeed and Lisa Flanagan

**Electrokinetics for Self-Assembly**  
Marquis Ballroom D  
Chairs: Eric Furst and Jun Wang

**Electrokinetics and Microfluidics for Bioanalytical Applications**  
Marquis Ballroom C  
Chairs: Zachary Gagnon and Sagnik Basuray

**Nanoscale Electrokinetics**  
Marquis Ballroom D  
Chairs: Nathan Swami

**Electroporation and Electrophysiology**  
Marquis Ballroom C  
Chairs: Michael B. Sano

**Electrokinetics in Non Polar Media**  
Marquis Ballroom D  
Chairs: Sven Behrens and Hitomi Mukaibo

12:30	Characterizing the Dielectric Properties of Human Mesenchymal Stem Cells and the Effects of Charged Elastin-like Polypeptide Copolymer Treatment – <b>T. Adams</b>	Selective Concentration and Separation of Colloidal Particles By Positive Reservoir-based Dielectrophoresis (rDEP) – <b>C. Thomas</b>	An Entropic Force Microscope Enables Nano-scale Conformational Probing of Biomolecules – <b>N. Shi</b>	On-Demand Control of the Limiting Current in Nano-slot Devices by Varying the Diffusion Layer Length – <b>S. Park</b>	An Electrophysiological Study of Chemotherapeutic Agents on Cancerous Cells using Dielectrophoresis – <b>S. Mahabadi</b>	Electromigration and Adsorption of Charge Carrier in Doped Nonpolar Liquids – <b>B. Yezer</b>
12:55	Membrane Capacitance as a Label-free Marker of Neural Stem Cell Fate – <b>L.A. Flanagan</b>	Ising Lattices of Asymmetric Colloidal Dimers Under Electric Fields – <b>F. Ma</b>	Quantification of Transcriptome and Functional Proteins from the Same Single Cells – <b>J. Wang</b>	Coupling AC Dielectrophoresis with DC Ion Concentration Polarization in Nanochannels for Ultrafast Biomarker Enrichment – <b>N. Swami</b>	Insulator Based Dielectrophoresis to correlate Cell Polarizability and Electrocompetency – <b>Z. Ge</b>	Charging of Hydrophobic Polymer Particles By Basic Surfactants in a Nonpolar Liquid – <b>J. Lee</b>
1:20	Membrane Capacitance: A Biomarker for Tumourgenicity/Stem Cell-like in Human Oral Cancer Cells – <b>F. H. Labeed</b>	Local Electrochemical Kinetics Allows for the Formulation of Physically Realistic Boundary Conditions for Fast Electrokinetic Applications – <b>M. Pribyl</b>	Probing Space Charge and Resolving Overlimiting Current Mechanisms at the Micro-Nanochannel Interface using Electrochemical Impedance Spectroscopy – <b>N. Leibowitz</b>	Tilted Post Arrays for Separating Long DNA – <b>K.D. Dorfman</b>	Micronanotip Injection Electroporation – <b>S. Wang</b>	Conductive Hydrogel Membranes Produced by Electrophoretic Deposition at the Interface of Immiscible Liquids – <b>J. L. Moran</b>

1:45	Electrical Tweezer for Highly Parallelized Electro-Rotation Measurements over a wide Frequency Bandwidth for Characterizing Microbial subpopulations – <b>N. Swami</b>	Optoelectric Assembly and Manipulation of Beads in a Vertical Tower Configuration – <b>A. Mishra</b>	An Orbital Shear Platform for in-vitro Real-Time Endothelium Characterization – <b>V. Velasco</b>	Electrophoretic Mobility of Nanoparticles Confined in Nanochannels – <b>Y.W. Liu</b>	Microfluidic Electroporation for Delivery of Cell-Penetrating Peptide Conjugates of PNA for Antisense Inhibition of Intracellular Bacteria – <b>S. Ma</b>	Microfluidic Mixing of Nonpolar Liquids by Contact Charge Electrophoresis – <b>C. A. Cartier</b>
2:10	Integrated Ion-exchange membrane based Microfluidic Platform for Early Detection of Oral Cancer – <b>S. Senapati</b>	Electrokinetic Colloid and Micro-Vortex Dynamics in Heterogeneous Nano-Slot Devices – <b>G. Yossifon</b>	Diffusion-based Microfluidic PCR for “One-Pot” Analysis of Cells – <b>S. Ma</b>	Broken Symmetry in the Electrokinetic Flow Surrounding Asymmetric Colloidal Dimers – <b>F. Ma</b>	A Rapid Microfluidic Assay for Optimization of Bacterial Electroporation Conditions – <b>P.A. Garcia</b>	Contact charge Electrophoresis for Powering Micro- and Nanotechnology – <b>K.J.M. Bishop</b>
2:35	Portable Smartphone-Enabled DNA Analysis – <b>A. Priye</b>	Size, Shell Material and Medium Conductivity Dependence on DEP behaviors of Air Core, Chitosan/Poly-L-Lysine Shell Nanoparticles: Experimental Results – <b>C. Yang</b>	High Throughput Microfluidic Separation of Tumor Initiating Cells (TICs) using Contactless Dielectrophoresis – <b>J. Cemazar</b>	Electrical Impedance Spectroscopy of Colloid-Nanoslot Interactions – <b>J. Schiffbauer</b>	Electrophysiology of Human Erythrocytes Exhibits Circadian Variation – <b>E. A. Henslee</b>	Continuous Label-Free Particle Separation Via Wall-Induced Lift in Electrophoresis – <b>X. Lu</b>

<b>3:15-5:45 PM</b>	<b>Soft Matter Electrokinetics: Particles, Drops and Bubbles</b> <i>Marquis Ballroom C</i> Chairs: <b>Stuart Williams and Christopher Wirth</b>		<b>Plenary Session of the AES Electrophoresis Society</b> <i>Marquis Ballroom C</i> Chairs: <b>Rodrigo Martinez-Duarte and Cullen R. Buie</b>		<b>Award Session of the AES Electrophoresis Society in honor of Prof. Pier Giorgio Righetti</b> <i>Marquis Ballroom C</i> Chairs: <b>Edgar Goluch and Mark Hayes</b>	
---------------------	---	--	---	--	--	--

3:15	Electrohydrodynamic Particle Structuring on a Drop Interface – <b>P.M Vlahovska</b>	3:15	Electrokinetic Manipulation for Characterization and Capture of Circulating Tumor Cells – <b>Brian Kirby</b>	3:15	Isoelectric Focusing: Current Limitations and Prospects – <b>A. Stoyanov</b>
3:40	The Effects of Charge Relaxation and Charge Convection on Nonlinear Electrohydrodynamic Drop Deformation – <b>J. Lanauze</b>	3:45	New Applications of Electrophoretic Deposition – <b>Jan Talbot</b>	3:45	Advances in Isoelectric Focusing – <b>A. R. Minerick</b>
4:05	A Deep Tertiary Minimum in the Particle/Electrode Interaction Energy in Oscillatory Fields – <b>W.D. Ristenpart</b>	4:15	Bigger, Cheaper, Faster, More! DEP-Well Electrodes for Cell Electrophysiology – <b>Michael P. Hughes</b>	4:15	Mathematical Modeling and Simulation Software for Electrophoresis – <b>M. Bello</b>
4:30	Electrokinetic Biosensing at Liquid Interfaces By Fluidic Dielectrophoresis – <b>N. Mavrogiannis</b>	4:45	Electrophoresis and Electroosmosis in Planar Nanofluidic Channels – <b>Sumita Pennathur</b>	4:45	Joachim Kohn (1912-1987) and the Origin of Cellulose Acetate Zone Electrophoresis – <b>R. M. Rocco</b>
4:55	Insulator-Based Micropipette Dielectrophoretic Trapping of Particles – <b>S. J. Williams</b>	5:15	Field-Driven Dynamics of Metallo-Dielectric Particles and Particle Ensembles: From Programmed Assembly to Directed Motility and Actuation – <b>Orlin Velev</b>	5:15	The Monkey King: A Personal View of the Long Journey Towards Proteomic Nirvana – <b>P. Righetti</b>
5:20	Optoelectric Trapping and Manipulation of Metal Nanoparticles – <b>A. Mishra</b>				

<b>6-7:30 PM</b>	<b>Poster Session</b> <i>Marquis Ballroom C</i> Chairs: <b>Blanca Lapizco-Encinas and Victor Ugaz</b>  AWARDS GIVEN TO BEST STUDENT POSTER!  Sponsored by LabSmith <a href="http://www.labsmith.com">www.labsmith.com</a>		<b>6-9 PM</b>	<b>Banquet. \$55 (payable at door)</b> @ “Morton’s The Steakhouse”, 303 Peachtree Center Avenue, (404) 577-4366.  INVITED SPEAKER: LCDR Neelam D. Ghiya, US Public Health Service Health Scientist/Training & Emergency Coordinator. Office of the Associate Director for Science, Office of the Director. Centers for Disease Control and Prevention (CDC).		<b>6-7 PM</b>	<b>Networking Event</b> @ White Oak Kitchen & Cocktails 270 Peachtree St NE, (404) 524-7200	
------------------	---	--	---------------	---	--	---------------	---	--

©The AES Electrophoresis Society 2014. Contact: **Matt Hoelter, Executive Director**, 1202 Ann St Madison, WI 53713 Ph: 608-258-1565 Fax: 608-258-1569 [matt-aes@tds.net](mailto:matt-aes@tds.net)

THANKS TO OUR SPONSORS AND EXHIBITORS:

