

## Draft Final Program

ANYL

## DIVISION OF ANALYTICAL CHEMISTRY

C. Larive, *Program Chair***SUNDAY MORNING**

Section A

**Capillary Electrophoresis as a Tool for Bioanalysis**C. R. Harrison, *Organizer, Presiding***8:30** . Isoelectric focusing of proteins in packed capillaries and channels. **M. J. Wirth**, Y. Hua, B. Koshel**9:00** . Development of microfluidic-based platforms for diversified analysis of chemical species. **F. A. Gomez**, A. Gaspar, J. Alvarado, M. Ortega, A. Wu, K. Rampasan**9:30** . Capillary electrophoresis in the study of nanoparticle-protein interactions. **W. Zhong****10:00** Intermission.**10:15** . Differentiation of protein complex isoforms with native capillary isoelectric focusing. **B. R. Fonslow**, J. R. Yates**10:45** . Phospholipid-derived coatings and stationary phases for electrophoretic capillary separations. E. M. Steinwenter, S. Adem, E. Mansfield, **C. A. Aspinwall****11:15** . Complex challenges of blood doping analysis: Capillary electrophoretic based methods for analysis. **C. R. Harrison**, S. Vydha, C. Green**SUNDAY AFTERNOON**

Section A

**Bioanalytical Sensors and their Applications**

Cospensored by BIOL

Q. J. Cheng, *Organizer, Presiding***1:30** Introductory Remarks.**1:40** . Nanomotor-based biosensing: Nanoscale motion transduction and isolation. **J. Wang**, S. Campuzano, D. Kagan, J. Orozco, W. Gao**2:10** . Novel combined methodologies for ultrasensitive biosensing: SPR phase imaging, enzymatic nanoparticles and aptamer microarrays. **R. M. Corn**, T. H. Seefeld, Y. Chen, A. R. Halpern, W. Zhou, M. W. Szyndler**2:40** . Nanobiodevice based single molecule and single cell sensing for cancer diagnosis and *in vivo* imaging of stem cell therapy. **Y. Baba****3:10** . Regenerative bioconjugation of whispering gallery mode optical resonators for label-free biosensing. **H. K. Hunt**, C. E. Soteropoulos, A. M. Armani**3:30** . Providing spatial and temporal distributions of biomarkers using microfluidic electrochemical biosensors. **M. M. Mensack**, J. B. Wydallis, N. S. Lynn, D. S. Dandy, C. S. Henry**3:50** Intermission.**4:10** . Using plasmonic devices to measure and harness biomolecule properties. **W. Hall**, J. Modica, J. N. Anker, M. Mrksich, R. P. Van Duyne**4:30** . DNA-based enzyme-linked assay for small-molecule detection. A. K. Sharma, A. D. Kent, **J. M. Heemstra****4:50** . Sensitivity in plasmon enhanced nanoscale metamaterial biosensors. **D. K. Roper**, D. Dejamette, B. Harbin, P. Blake**5:10** . Ultrasensitive biosensors via reversible mixed SAMs. **A. Tenboll**, B. Sellergren

Section B

**Fluorescence Imaging of Cellular Structure and Dynamics**

Cospensored by BIOL

H. Ai, *Organizer, Presiding***1:30** . Circuit algorithm of tunable intramolecular interactions embedded within Shp2 revealed by FRET. **J. Sun**, S. Lu, M. Ouyang, L. Lin, Y. Zhuo, B. Liu, R. Chan, S. Chien, B. G. Neel, **Y. Wang****2:00** . Live cell imaging of NAD(P)H quinone oxoreductase isozyme 1 using cloaked fluorophores. **R. L. McCarley**, W. C. Silvers**2:30** . Genetically encoded imaging probes with unprecedented spatiotemporal resolution. **X. Shu**, D. Yu, T. To**3:00** . Protein chemistry and engineering for live-cell imaging. **P. Chen****3:30** Intermission.**3:50** . Fluorogenic red fluorescent protein heterodimers: a new template for live cell biosensor design. **S. C. Alford**, R. E. Campbell**4:10** . Red fluorescent protein  $Ca^{2+}$  indicator based on quantum yield and extinction coefficient modulation. **H. J. Carlson**, R. E. Campbell**4:30** . Fluorescent biosensors for chemicals of environmental and biological interests. **H. Ai****SUNDAY EVENING**

Section A

**General Posters**C. Larive, *Organizer, Presiding***7:00 - 9:00**. Composition and physical characterization of an Iron Age pithos. **J. Helbley**, D. Clark, M. Chang, S. Mavingre, M. Shah, C. Wang. Spectroscopic analysis of pigments in late 18<sup>th</sup> and early 19<sup>th</sup> century portrait miniatures by William Wood. **K. R. Houston**, R. R. Hark, L. Burgio, A. Derbyshire. On-line reaction monitoring using Infrared and Raman spectroscopy. **T. H. Patwa**, S. X. Li. Online reaction monitoring using IR and Raman spectroscopic tools. **T. H. Patwa**, S. Li. Development of surface-enhanced Raman scattering based optical probes for *in vivo* chemical detection. **N. Koeppen**, A. Jansons, S. R. Emory

- High speed IR pump-probe microscopy with a phase-stable pulse pair generator. **R. Muir**, G. Simpson
- Use of fluorescent DNA-templated gold/silver nanoclusters for the detection of sulfide ions. **W. Chen**, G. Lan, H. Chang
- Detection of hemoglobin in a single drop of blood using luminescent gold nanodots. **L. Chen**, C. Huang, W. Chen, H. Chang
- Plasmonic cap arrays for tunable SERS response *via* elastic deformation. **H. Kang**, C. Heo, H. Jeon, S. Lee, S. Yang
- Core-satellites Assembly of Plasmonic Nanoparticles for the On-chip Colorimetric Sensors. H. Song, I. Choi, S. Lee, Y. Yang, S. Park, E. H. Kim, M. Eo, T. Kang, **J. Yi**
- Surface plasmon resonance detection for a miniaturized capillary electrophoresis system. **A. Gaspar**, F. A. Gomez
- Development of a selective fluorescence sensor for the organophosphate pesticide, fenthion. **Q. L. Tran**, J. T. Wabeke, R. M. Hoffmann, S. O. Obare
- Laser-induced fluorescence detection of NO<sub>2</sub>. **J. Mosley**, T. Cline, J. C. Hansen
- Relationship between laser-induced fluorescence and matrix chemistry in thermally damaged polymer composites. **C. N. Young**, C. R. Clayton, W. R. Scott, G. M. Connelly, R. Granata
- Determining the photolysis rate constant of peracetic acid by measuring the absorption cross sections of the O-H stretching overtones using cavity ring-down spectroscopy. **M. Fiddler**, S. Singh, S. S. Brown, S. Billigin
- Ultrasensitive nonlinear laser wave-mixing spectroscopic detection of chem/bio agents. **M. Hetu**, J. Jimenez, M. Gregerson, W. G. Tong
- Determination of the provenance of cassiterite ore concentrates using laser-induced breakdown spectroscopy (LIBS). **I. K. Potter**, R. R. Hark, B. M. Tansi, K. Hilferding, L. J. East, J. J. Remus, R. S. Harmon, M. A. Wise
- meso*-Tetraarylnitroprophalactones: Tuning the pH range for optical high pH sensing. **J. Worlinsky**, G. Zarate, M. Ghandehari, G. Khalil, C. Brückner
- Laser-induced breakdown spectroscopy (LIBS) for geochemical fingerprinting of columbite-tantalite sources. **B. M. Tansi**, I. K. Potter, L. J. East, J. J. Remus, R. S. Harmon, M. S. Wise, R. R. Hark
- Nanostructured immunosensor for attomolar detection of cancer biomarkers using massively labeled superparamagnetic particles. **B. S. Munge**, A. L. Coffey, J. M. Doucette, B. K. Somba, R. Malhotra, V. Patel, S. Gutkind, J. F. Rusling
- Environmental effects on aptamers. **A. E. Miller**, M. Smith, A. Hillebrand, K. Wang
- Dramatically enhanced oxygen uptake and ionization yield with C<sub>60</sub><sup>+</sup> sputtering. **H. Liao**
- Characterization of polymetric phthalocyanine nanoparticles using DLS and small angle X-ray scattering. **S. Murarishetty**, G. K. Kalapala, P. K. Fu
- Effect of specimen temperature on C<sub>60</sub><sup>+</sup>-Ar<sup>+</sup> co-sputtering of polymers. **M. Tsai**
- MALDI-TOF MS/MS analysis of the block copolymer mPEG-*b*-PS. **A. C. Crecelius**, C. R. Becer, K. Knop, U. S. Schubert
- Monitoring surface changes of UV-treated polymer films by MALDI-MSI. **A. C. Crecelius**, T. Alexandrov, U. S. Schubert
- Development of a biomedical diagnostic method based on exhaled breath analysis by GC-MS. **A. M. Patel**
- An automated high-throughput assay for microsomal binding with ultra fast liquid chromatography-tandem mass spectrometry. **Y. Lau**, S. Doktor, S. M. de Moraes
- Graphene/block co-polymer based field effect transistor device pH sensor. **S. Guo**, M. Ozkan, C. S. Ozkan
- Electrochemistry of propazine. **J. H. Brown**, M. J. Bruzek, J. K. Henderson, R. L. Hull, S. B. Becht
- Rejuvenation of a fluoride ion-selective electrode for use in flow injection analysis. **P. Hies**, L. Giddings, R. Valcarce, M. Alvarez, J. Warren, N. Bastian, A. Allen Nagle, J. Reilly, Z. Jones, S. Moore, O. Shill, C. Kamborian
- A two-season survey of cadmium, lead, and copper in a recreational harbor by anodic stripping voltammetric analysis utilizing the gallium-modified bismuth film electrode. **K. R. Brereton**, M. Miguelino, D. B. Green
- Fabrication and application of magnetic porous pseudo-carbon paste electrode electrochemical biosensor. **L. Xu**, J. Du, Y. Deng, N. He
- Direct electron transfer of *Trametes hirsuta* laccase in a dual-layer-architecture of poly(3,4-ethylenedioxythiophene) films. **X. Wang**, R. Latonen, P. Sjöberg-Eerola, J. Bobacka, M. Bergelin
- Differential pulse anodic stripping voltammetry (DPASV) for the detection of barium from oil well water. **C. A. Woolever**
- Novel sulphydryl compound detection method based on photoelectrochemical response of photoelectrochemical study of a layer-by-layer immobilized CdS QDs film for biosensing techniques. **A. Ramos**, Q. Hao, D. Jiang
- Enabling *in vitro* workflow for rapid identification of unique metabolic biomarkers from chemical warfare agent exposure. **J. M. McGuire**, R. J. Lawrence, E. M. Jakubowski, Jr
- Determination of Carbonic Anhydrase activity by Wilbur-Anderson in a 96-well plate reader. **S. B. Mortensen**, R. V. Gregersen
- Preparation of red blood cells for the detection of autologous blood doping by capillary electrophoresis. **C. C. Green**, C. R. Harrison
- In situ* analysis of the synthesis of ergovaline using direct analysis in real time mass spectrometry (DART-MS). **A. Galassie**, D. L. Smith, N. Tice
- Micelle and sample stacking fundamentals in micellar electrokinetic chromatography under low electroosmotic flow conditions. **M. H. Milam**, C. L. Copper, B. C. Giordano, D. S. Burgi, G. E. Collins
- Effect of electroosmotic flow attenuation on stacking in micellar electrokinetic chromatography. **A. L. Maldonado**, C. L. Copper, B. C. Giordano, D. S. Burgi, G. E. Collins
- Microbial degradation of gasoline used in incendiary devices: Triclosan as a solution. **D. A. Turner**, J. V. Goodpaster
- Development of disposable pipette extraction (DPX) for determination of drugs of abuse in water samples by GC/MS and HPLC/UV. **H. Guan**, A. Fatima, S. Nagabandi, P. G. Kunuru
- Cucurbit[6]uril as a macrocyclic separator of alkali metals and amines in ion chromatography. **S. Morley**, N. Li, R. G. Harrison, J. D. Lamb
- Cyden-Resorcinarene column for the selective concentration of transition metal ions in chelation ion chromatography. **A. Eaton**, T. Christensen, C. English, A. Gillespie, N. Li, R. G. Harrison, J. D. Lamb
- Thermal and photolytic degradation of promethazine hydrochloride solutions. **M. L. Hinrichs**, T. Cline, J. C. Hansen, L. D. Hansen, M. Mayo
- Dissolution and analysis of salicylic acid found in stomach relief caplets. **C. N. Gilmore**, A. C. Smith, L. D. Williams, M. C. Koether
- Rapid CZE method to detect HBOCs in the human whole blood. **S. Vydha**, C. R. Harrison
- Determination of dibenzo-p-dioxin in diphenyl oxide using gas chromatography with mass spectrometric detection. **C. Russo**, F. Hileman
- Analysis of lignocellulosic biomass dissolved in ionic liquid media by DART-mass spectrometry. **M. G. Mazzotta**, D. L. Smith, L. A. Morton, S. A. Morton, III
- Selectively altering electroosmotic flow from incorporation of SDS. **N. Allen**, C. Harrison
- Chemiresistor sensor array for identifying low-molecular weight molecules in the liquid-phase. **E. Chow**, B. Raguse, L. Wiczorek, J. S. Cooper, L. J. Hubble, M. Webster, K. H. Müller
- Design and development of a novel microfluidic direct methanol fuel cell. **J. E. Alvarado**, A. Wat, D. T. Botoaca, F. A. Gomez
- Use of methacrylate monolith inside of SU-8 microchip for on-line concentration of hydrophobic analytes before on-chip CZE-ESI/MS analysis. N. Nordman, **B. Barrios**, S. Tiina, S. Aura, P. Suvanto, T. Kotiaho, S. Franssila, R. Kostianen
- Reagent-free detection of small molecules using supported lipid bilayer. **X. Zuo**, R. F. Williams, B. I. Swanson
- Molecularly imprinted aptamers of gold nanoparticles for enzymatic inhibition and detection of thrombin. **Y. Liao**, Y.

Shiang, C. Huang, H. Chang

- . Chemiluminescence detection of hepatitis B virus (HBV) based on magnetic nanoparticles and whole genome amplification. M. Chao, L. Chuanyan, W. Fang, L. Zhiyang, L. Xiaolong, **H. Nongyue**
- . High performance liquid chromatographic method for the separation of enantiomeric ES-Citalopram oxalate. **M. Doguparthi**, B. Lingavarapu, G. Setti, S. Yarra, K. Thota, H. Bommana, R. Nirogi
- . High performance liquid chromatographic method for the separation of racemic Carvedilol. **B. Lingavarapu**, M. Doguparthi, G. Setti, K. Thota, R. Nirogi
- . Development of a microfluidic gradient generator to measure osteoblast cell activity in magnesium-conditioned media. **H. Carmona**, G. Venkataraman, Y. Yun, B. Collins, F. A. Gomez
- . Drug screening assay for Alzheimer's disease using localized surface plasmon resonance spectroscopy and MALDI mass spectrometry. **L. K. Ruvuna**, K. Wilcox, S. G. Sliagar, W. L. Klein, R. P. Van Duyne
- . Ultrasensitive analysis of biomarkers by nonlinear laser wave-mixing detection and capillary electrophoresis. **M. Iwabuchi**, T. Neary, M. Hetu, H. Wu, A. Warren, W. G. Tong
- . New functionalizations of diamond-based pellicular particles for HPLC. **A. M. Larsen**, L. A. Wiest, A. E. Dadson, M. A. Vail, M. R. Linford
- . Determination of volatile aldehydes in university library air using passive sampling. **T. I. Boundy**, D. B. Green, J. A. Ganske
- . Characterization of antibody sites of conjugation using Q-TOF mass spectrometry. **P. Ozaeta**, J. Lagedrost, M. Pope, J. Fishpugh, C. S. Ramsay
- . Capillary electrophoresis as a tool for monitoring the nature of protein-nanoparticle conjugation. **J. Vo**
- . Evaluation of NOAD detector for analysis of potentially genotoxic impurities. **Y. Berezniatski**, D. Waterhouse, H. Wang
- . Smart polymer sensors for protein classification and quantification. **M. E. Kozelkova**, N. Esipenko, P. Anzenbacher
- . Implementation of hybrid neural network methodology in optimizing fluorescence in receptor-ligand binding interactions and enzyme-catalyzed reactions on microchips. **J. E. Alvarado**, H. M. Valadez, K. C. Rampasan, G. Hanrahan, F. A. Gomez
- . Temperature gradients in solvating gas chromatography. **J. H. Everett**, S. R. Goates
- . Characterization of hookah tobacco and the particulate phase of hookah smoke. **M. Gilliland**, C. D. Hauser
- . Fabrication of ion selective electrodes and their application for metallic biomaterials. **X. Guo**, W. R. Heineman
- . Capillary electrophoresis for the analysis of RNA delivery vehicles. **L. J. Klein**
- . Magnetic affinity capture coupled with handheld cytometry for detection and analysis of folate receptor-positive cancer cells. **J. Hakenjos**, C. Zmudka, R. Yerabolu, **W. A. Henne**
- . Development of a new LC-ESI-MS method to quantify potential ellagitannin-derivatives formed during red wine barrel maturation. **A. Oberholster**
- . Comparison of performance parameters of 2 electrode flowcell designs for flow injection analysis. **P. J. Iles**, A. Allen Nagle, J. Reilly, Z. Jones, S. Moore, O. Shill, C. Kamborian, L. Giddings, J. Warren, N. Bastian, M. Alvarez
- . Synthesis of LIMP<sub>04</sub>(M=Ni, Mn, Co) nanoparticles to develop lithium-ion batteries. **M. L. Quintero**, T. Kai, J. Dianlu, F. Zhou
- . Chlorpheniramine analysis in pharmaceutical applications by sequential injector. **T. A. Saleh**
- . Fast and economic chiral-HPLC method of nebivolol enantiomer resolution in dosage formulation. **Z. A. ALOthman**, I. Ali
- . Probing bifunctionality of protic NHC complexes. **D. N. Catrone**, J. K. Martin, T. N. Tom, V. Miranda-Soto, C. E. Moore, J. D. Golen, D. B. Grotjahn, A. L. Rheingold
- . Measurements of diffusivities of fuel surrogates in supercritical CO<sub>2</sub> by the chromatographic technique. **R. Lin**, L. L. Tavlariades
- . Sensitive arsenic analysis by carrier-mediated single drop microextraction coupled with capillary electrophoresis. K. Cheng, K. Choi, J. Kim, **D. S. Chung**
- . Fast separations for detection and identification of VOC's by GC/PID/FID. **J. L. Maclachlan**, **J. N. Driscoll**, S. Stearns
- . Volatile compounds analysis using solid phase microextraction (SPME). **E. Rivera-Tirado**, **J. Cartagena-Brigantti**
- . Optimization and comparison of the GC, GC/MS and SPME methods for volatile compounds. **J. & Pagán-López**, **E. Rivera-Tirado**
- . Use of pyrolysis-GC/MS in the analysis of illegal products containing drugs of abuse. **D. Sbenaty**, N. V. Patel, N. S. Chong
- . Analytical determination of trace ciprofloxacin antibiotic concentrations in pure and drug formulation forms. **A. M. Kawde**
- . Method development for the separation and characterization of oxygenated benzoapyrene using gas chromatography-mass spectrometry. **M. Roa**, K. L. Foster
- . Determination of persistent organochlorine pollutants in lake sediments from Egypt by GC/ECD analysis. **A. O. Barakat**, A. R. Mostafa, T. L. Wade, S. T. Sweet, N. B. El Sayed
- . Low-density solvent based solvent demulsification dispersive liquid-liquid microextraction followed by gas chromatography-mass spectrometric analysis for the determination of polybrominated diphenyl ethers in environmental samples. **L. Guo**, H. Lee
- . Determination of phenylurea herbicides in river water by monolithic solid-phase extraction and rapid resolution liquid chromatography with UV detection. **S. Lin**, M. Fuh
- . Environmental aerosol emissions into a residential neighborhood analyzed by inductively coupled plasma – mass spectrometry. **D. F. Aly**
- . Analysis of dental parameters, fluoride and pH, in Utah's waters, drinks and foods. **P. Iles**, R. Valcarce, L. Giddings, M. Alvarez, J. Warren, N. Bastian, A. Allen Nagle, J. Reilly, Z. Jones, S. Moore, O. Shill, C. Kamborian
- . Anodic stripping voltammetric analysis of lead, cadmium and copper in the Jordan river, Utah. **P. Iles**, C. Thurman, J. Warren, W. Sanders, S. Richards, L. Parker, R. Valcarce, L. Giddings, M. Alvarez, N. Bastian
- . Simultaneous separation, qualification and quantification of primary aromatic amines in pinter's ink. **S. Marten**, M. Naguschewski
- . Structural characterization of yellow and purple yams using infrared and Raman spectroscopies. **C. Davidson**, A. Taylor, A. Sunda Meya, N. Phambu
- . Possible nutritional value of some medicinal herbs grows in the North Africa. **E. A. Belgasem**, R. I. Damja
- . Investigation of taurine, B vitamins, and caffeine in commercially available energy drinks by High Performance Liquid Chromatography Mass Spectrometry. **G. J. Pastore**, N. E. Breen
- . Analyses of the degradation of flavor volatiles in single origin high cacao content specialty chocolates via GC-MS. **M. Alvarez**, A. Scottorn, S. Richards, O. Shill, M. Jaziri, F. Baray, M. Houston, P. Iles, R. Valcarce, L. Giddings, N. Bastian, J. Warren

#### MONDAY MORNING

Section A

#### Bioanalytical Sensors and their Applications

Cosponsored by BIOL  
O. J. Cheng, *Organizer, Presiding*

**8:30** . Ion channel-functionalized, highly-stable suspended lipid bilayers for label-free sensing. M. T. Agasid, T. J. Comi, B. A. Heitz, S. S. Saavedra, **C. A. Aspinwall**

**9:00** . New strategies for biosensing and cytosensing. **H. Ju**

**9:30** . Rapid Identification of Bacteria with a Disposable Colorimetric Sensing Array. **K. S. Suslick**, J. R. Carey

**10:00** . Mediated enzyme electrochemistry: Signal output and stability enhancement using tailored mediators. **B. Egan**, P. Connolly, P. Kavanagh, D. Leech

**10:20** Intermission.

**10:40** . DNA-based Encoder and Decoder Devices Constructed by Biosensors. **F. Xia**

**11:00** . Fiber optic SPR assay for enhanced real-time PCR analysis of non-transparent samples. **J. Pollet**, K. Knez, K. P. Janssen, D. Spasic, J. Lammertyn

**11:20** . Cell free protein microarray fabrication from DNA microwell template via *in vitro* transcription/translation and the detection of attomole DNA template. **T. H. Seefeld**, R. M. Corn

**11:40** . Multiplexed detection of cancer biomarkers using quantum dot-mesoporous silica composite particles. **K. E. Schexnayder**, A. C. Wicks, Z. Rosenzweig, M. A. Tarr

Section B

#### Active Learning in the Undergraduate Analytical Chemistry Curriculum

Cosponsored by CHED

T. Wenzel, *Organizer, Presiding*

**8:30** Introductory Remarks.

**8:35** . Context-based modules to introduce elements of chemical equilibrium and water analyses. **A. G. Cavinato**, W. H. Otto, S. C. Petrovic

**8:55** . The Lake Nakuru flamingos - a case study-based active learning project. **C. K. Larive**

**9:15** . An industrial perspective on active learning in analytical chemical education. **D. J. Phillips**

**9:35** Intermission.

**9:55** . Environmental friendly synthesis, characterization and bactericidal activity of starch encapsulated gold nanoparticles. **D. S. Pender**, L. M. Vangala, R. Dakshinamurthy

**10:15** . Tale of ales: Project based learning in analytical chemistry laboratory. **J. K. Robinson**

**10:35** . A guided research laboratory model for a large analytical chemistry course—The Wisconsin idea at work. **P. S. Doolittle**, L. M. Zelewski, R. J. Hamers, J. Hamers, M. A. Wendt, J. C. Wright

**10:55** . Introducing undergraduates to the role of science in public policy and in the service of the community. **C. Hosten**, G. Talanova, K. Lipkowitz

**11:15** Panel Discussion.

**MONDAY AFTERNOON**

Section A

#### Bioanalytical Sensors and their Applications

Cosponsored by BIOL

R. Corn, *Presiding*

**1:30** . Nanoporous Electrochemistry: New Opportunity for Biosensors and Neural Probes. **T. Chung**

**1:50** . Color tunable poly (N-isopropylacrylamide) microgel based assemblies for biosensing. **M. J. Serpe**, C. D. Sorrell

**2:10** . Nanoparticle-coupled aptamer switches for the enzymatically amplified detection of protein biomarkers with surface plasmon resonance imaging. **Y. Chen**, R. Corn, K. Nakamoto

**2:30** . P450 microarrays fabricated in microwells by the inkjet printing. **E. Kanemura**, M. Yamada, T. Goto, Y. Tatsu, H. Imaishi, K. Morigaki

**2:50** . Calcinated silicate nanofilm on biosensor chips for matrix-free mass spectrometric analysis. **C. Chen**, J. Duan, Q. Cheng

**3:10** Intermission.

**3:30** . 1-ethyl-3-methylimidazolium tetrafluoroborate used to "wire" cholesterol oxidase. **M. D. Leonida**, M. Omolo, J. Elie, S. Ghumwala, B. Aurian-Blajeni

**3:50** . Multiplexed detection of leukocyte-secreted cytokines using micropatterned aptasensors. **Y. Liu**, T. Kwa, Q. Zhou, J. Enomoto, A. Revzin

**4:10** . The synthesis, characterization, and applications of an M13 phage-DNAzyme bioconjugate. **D. W. Domaille**, J. Lee, J. N. Cha

**4:30** . Flexible bio-inspired nanosensor. **Y. Cui**

Section B

#### Active Learning in the Undergraduate Analytical Chemistry Curriculum

Cosponsored by CHED

T. Wenzel, *Organizer, Presiding*

**1:30** Introductory Remarks.

**1:35** . An NSF-funded project aimed at developing active-learning materials for the undergraduate analytical chemistry curriculum. **T. Wenzel**

**1:55** . Investigation of Beer's law using a student-built instrument. **T. Thomas-Smith**, A. Anderson

**2:15** . Student driven independent research projects – Developing a framework for success in analytical chemistry at Northern Kentucky University. **H. A. Bullen**

**2:35** Intermission.

**2:55** . Implementing project management concepts in analytical chemistry laboratory course for students' systematic learning. **X. Song**, Y. Fan

**3:15** . Analytical chemistry taking the course out into the environment for active group learning. **D. LeCaptain**, S. Murphy, J. Tomasik

**3:35** . Integrating concepts from chemical analysis into middle and high school science through service learning. **J. A. Gardella**

**3:55** Panel Discussion.

#### Microalgae-Derived Products

Sponsored by I&EC, Cosponsored by ANYL and CELL

**MONDAY EVENING**

Section A

Sci-Mix

7:00 - 9:00

## TUESDAY MORNING

Section A

## Bioanalytical Sensors and their Applications

Cosponsored by BIOL  
Q. J. Cheng, *Organizer*  
A. Mulchandani, *Presiding*

- 8:30** . Carbon nanostructures-based chemiresistive bio/chemical sensors. **A. Mulchandani**
- 9:00** . Two simple ways of creating protein micropatterns on solid surfaces. **K. Yang**, C. Xue
- 9:20** . Enhancing the rapid detection of protein markers using aqueous two-phase complex fluid systems. **F. Mashayekhi**, P. M. Nafisi, A. M. Le, C. D. Yamanishi, B. M. Wu, D. T. Kamei
- 9:40** . Biosensors for organophosphorus pesticides based on gold nanoparticle and carbon nanotube modified electrodes. **T. Kang**, F. Wang, J. Zhang, L. Lu, S. Cheng
- 10:00** Intermission.
- 10:30** . Controlling the performance of electrochemical glucose biosensors through Pt nanoparticle electrodeposition on arrays of multi-layered graphene petal nanosheets and single-walled carbon nanotubes: Simulation and experiment. **J. C. Claussen**
- 10:50** . Response characteristics of a liquid crystal based diagnostic sensor for gaseous organophosphonates. **G. Coimbatore**, L. McDaniel, T. Dallas, G. Cobb
- 11:10** . Electrochemical aptasensors towards sensing of proteins. **A. Erdem**
- 11:30** . Novel biosensor based on nanoporous materials attached with DNA Nanolock. **J. Feng**, J. Wu

Section B

## Advances in Bioanalytical Chemistry

C. Larive, *Organizer*  
J. Lyubovitsky, *Presiding*

- 9:00** . Electrochemical study of basepair mismatches and overhangs in DNA films. **M. H. Shamsi**, H. Kraatz
- 9:20** . Electrochemical Impedance Microscopy: A Label-free Technique for Monitoring Individual Cells and Intracellular Processes. **W. Wang**, K. Foley, X. Shan, S. Wang, S. Eaton, V. Nagaraj, P. Wiktor, U. Patel, N. Tao
- 9:40** . Active control of ionic and molecular transport through semiconducting conical nanopores. T. James, Y. V. Kalinin, C. Chan, J. S. Randhawa, M. Gaeviski, **D. H. Gracias**
- 10:00** . Binding induced nano-switch for homogenous protein detection. **F. Li**, X. C. Le
- 10:20** Intermission.
- 10:40** . PRRSV detection using an aptamer-based SPR biosensor. **S. Lee**, Y. Kwon, J. Lee, M. Gu
- 11:00** . Development of RNA nanostructures for drug delivery. **B. Wang**, M. S. Thompson, K. M. Adkins
- 11:20** . Simultaneous detection of dopamine and adenosine using a boron-doped diamond electrode. **T. A. Mathews**, J. A. Birbeck
- 11:40** . Multi-scale and multi-modality characterization of collagen hydrogels cross-linked with zero versus non-zero linkers. Y. Hwang, J. Granelli, **J. G. Lyubovitsky**

## ACS Award in Separations Science and Technology: Symposium in Honor of Milton Lee

## Honoring Milton L. Lee of Brigham Young University

Sponsored by I&amp;EC, Cosponsored by ANYL

## TUESDAY AFTERNOON

Section A

## Bioanalytical Sensors and their Applications

Cosponsored by BIOL  
C. Chen, Y. Liu, *Presiding*

- 1:30** . SPR detection of peptides with on-plate desalting and direct MALDI-MS analysis on a thermoresponsive polymer surface. **Y. Liu**, Q. Cheng
- 1:50** . Design and characterization of a new electrochemical peptide-based biosensor for detection of Arah2 antibodies. **A. J. Zaitouna**, R. Y. Lai
- 2:10** . Array-based sensing of proteins using conjugated polyelectrolytes with fluorescence correlation spectroscopy. **D. Wu**, K. S. Schanze
- 2:30** . Intracellular NOO1 activation of a cloaked fluorescent dye. **W. C. Silvers**, R. L. McCarley
- 2:50** Intermission.
- 3:20** . Detection of glyphosate by using gold nanoparticle based colorimetric aptasensors. **S. Lee**, Y. Kwon, M. Gu
- 3:40** . Equilibrium and dynamics of human IgG adsorption to novel peptide affinity ligands using Surface Plasmon Resonance. **N. Islam**, F. Shen, P. V. Gurgel, O. J. Rojas, R. G. Carbonell
- 4:00** . Electrochemistry of the interaction of carbaryl with ds-DNA using  $[Ru(bpy)_2dppz]^{2+}$  as probe. **T. Kang**, Y. Xiong, L. Lu

Section B

## Advances in Bioanalytical Chemistry

J. Lyubovitsky, *Presiding*

- 2:00** . Small variations in surface ligands of nanoparticles caused distinct protein binding. **S. Zeng**, N. Li, W. Zhong
- 2:20** . Colorimetric detection of plasticizers in drinks using UTP-modified gold nanoparticles cross-linked by copper (II). **M. Zhang**, B. Ye
- 2:40** . Size dependent antimicrobial activity of sugar encapsulated gold nanoparticles. **L. M. Vangala**, V. D. Badwaik, R. Dakshinamurthy
- 3:00** . High-throughput single nucleotide polymorphisms (SNPs) detection and copy number variations (CNVs) analysis with the help of magnetic nanoparticles. **N. He**, Y. Deng
- 3:20** Intermission.

**3:40** . Multifunctional phosphonium-lanthanide nanoGUMBOS as tumor targeting agents. **P. Magut**, J. Mason, C. Lu, M. Li, S. Das, V. Fernand, D. Hayes, S. Aggarwal, R. Jin, I. Warner

**4:00** . Surface-enhanced Raman-based bioanalytical probes and sensors. **S. R. Emory**, N. Koeppen, C. San, L. Bergquist, D. Rider

**4:20** . Identifying the nanoparticle-protein corona via field flow fractionation: Surface coating dependencies. **J. Ashby**, W. Zhong

#### ACS Award in Separations Science and Technology: Symposium in Honor of Milton Lee

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#### WEDNESDAY MORNING

Section A

#### Advances in Environmental Analysis

C. Larive, *Organizer, Presiding*

**9:00** . Coherent vibrational spectroscopy and electronic imaging for contrasting secondary organic aerosol particles from various sources. **C. J. Ebben**, I. Martinez, M. D. Peterson, M. Shrestha, F. M. Geiger

**9:20** . Probing the response mechanisms of resonating nanocantilever chemical vapor sensors by tailoring the properties and location of sorptive films through surface initiated polymerization. **H. C. McCaig**, E. B. Myers, X. Zhang, N. S. Lewis, M. L. Roukes

**9:40** . VOCs detection by single-walled carbon nanotubes-(poly)porphyrin hybrid. **T. Sarkar**, N. V. Myung, A. Mulchandani

**10:00** Intermission.

**10:20** . Detection and Identification of Stachybotrys chartarum Microbial Volatile Organic Compounds (MVOCS) On-Site Using Person-Portable Gas Chromatography/Mass Spectrometry (GC-MS) Using a Thermal Desorption Accessory. **A. E. Gifford**

**10:40** . Designing a luminescent sensor for pertechnetate (TcO<sub>4</sub><sup>-</sup>). **S. Chatterjee**, M. K. Edwards, Z. Wang, W. R. Heineman, C. J. Seliskar, S. A. Bryan

**11:00** . Is SPE necessary? A quantitative comparison of matrix effects on estrogens and perfluorinated chemicals from large-volume injection and solid-phase extraction.

. **W. J. Backe**, J. A. Field

**11:20** . Signal-Amplifying Fluorescence Polymer for Ultra-sensitive Detection of Nitroaromatics in Aqueous Solution. **Y. Wang**, A. La, C. Bruckner, Y. Lei

Section B

#### Advances in Bioanalytical Chemistry

J. Lyubovitsky, *Presiding*

**9:00** . Measurement of GAG concentration in intervertebral disc via NMR method. **B. Zhang**, A. Jerschow

**9:20** . Carbohydrate sensing with an artificial nanopore. **B. Vilozy**, A. Wollenberg, D. Hwang, P. Actis, B. Singaram, N. Pourmand

**9:40** . Glycosaminoglycan characterization through sulfamate analysis by 1H and 15N NMR spectroscopy. **D. J. Langeslay**, C. Beecher, S. Beni

**10:00** . Hyphenation of capillary isotachopheresis to a microslot NMR probe designed for separation and analysis of mass-limited samples. **C. J. Jones**, C. K. Larive

**10:20** Intermission.

**10:40** . Raman spectroscopy detects non-enzymatically induced cross-links within collagen hydrogels. **Y. Hwang**, J. Lyubovitsky

**11:00** . Effects of functional lipids on the transmembrane activity of alpha-hemolysin. **T. Hsin**, K. Wu

**11:20** . Development of <sup>15</sup>N-labeled C-reactive protein as internal standard for whole protein value assay. **D. Song**, L. Wu, B. Xu, C. Gao, S. Liu, X. Dai, H. Li

#### WEDNESDAY AFTERNOON

Section A

#### Challenges in Algal Biofuels: Biochemistry, Lipid Extraction and Analysis

Cosponsored by CELL

J. Limtiaco, *Organizer*

R. S. Pomeroy, *Organizer, Presiding*

**1:00** . Development of biodiesel standard reference materials (SRMs) for chemical composition and physical properties. **S. A. Wise**, M. M. Schantz

**1:20** . The role of protein-protein interactions in algal fatty acid synthase engineering. **M. D. Burkart**

**1:40** . Production of industrial enzymes in algae to enable cellulosic biofuels. **S. Mayfield**

**2:00** . High-throughput algae culturing and analysis methods. **J. L. Wade**

**2:20** . Challenges of generating algae biomass at scale for biofuel production. **R. McBride**, C. Behnke, N. Heaps

**2:40** . The characterization of algae crude oils. S. G. Roussis, **D. Liu**

**3:00** . Methods for determining sugars and hydroxymethyl furfural in biomass. **L. Basumallick**, J. Rohrer, D. Hurum

**3:20** . Dielectric measurement of algal lipid content. **M. S. Bono**, K. Rhoads, B. A. Ahner, B. J. Kirby

**3:40** . Workflow for the extraction, fractionation, and Q-TOF LC/MS/MS analysis of lipid classes in various algae strains. **J. Bartalis**, P. J. Domaille, C. J. Mikelatis, J. W. Toporowski, C. A. Packard, J. R. Gurr

**4:00** . Swellable glass materials for solvent-free capture and release of lipids from algae biofuel feedstocks. **P. L. Edmiston**

**4:20** . Direct elemental analysis of biofuel and biofuel additions using XRF spectroscopy. A. Martin, **A. Seyfarth**, W. Watson

**4:40** . Characterizing the chemical content of organisms with FT-IR spectroscopy. S. Lowry, **J. W. Hellgeth**

**5:00** . Training the future biofuel workforce. **J. Limtiaco**, R. Pomeroy

Section B

#### Advances and Applications of Metabolomics and Screening

C. Larive, *Organizer, Presiding*

**1:30** . Development and validation of a metabolite profile for the early detection of breast cancer recurrence. **D. Rafferty**, V. Asiago, L. Alvarado, H. Gu, D. Djukovic

**2:00** . Profiling secondary metabolome isomeric diversity of glandular trichomes of tomato and its wild relatives using liquid chromatography/mass spectrometry. **B. Ghosh**, T. Westbrook, J. Kim, E. Gonzales-Vigil, A. L. Schillmiller, C. Barry, R. L. Last, A. D. Jones

**2:20** . Multi-platform metabolomics: Combining NMR and GC-MS to give a deeper understanding of the rice metabolome. **G. A. Barding**, D. J. Orr, T. Fukao, J. Bailey-Serres, C. K. Larive

**2:40** . Comparing drought tolerant and intolerant rice varieties: Exploration of the additional roles of SUB1A. **S. M. Sathnur**, G. Barding, T. Fukao, J. Bailey-Serres, C. K. Larive

**3:00** Intermission.

**3:20** . <sup>1</sup>H NMR profiling and chemometrics for adaptive authentication of fruit juices and identification of marker compounds. **D. J. Orr**, G. A. Barding, S. M. Sathnur, C. K. Larive

**3:40** . Standardizing and accelerating analytical sample preparation - flexible, easy, and rugged. **A. Schnyder**

**4:00** . MALDI-MS detection and identification of bacterial toxins captured by cell-surface receptors on a stable yet fluid lipid bilayer. **B. Liang**, J. R. Joubert, E. J. Kaleta, Y. Ju, I. W. Jones, J. P. Keogh, H. K. Hall, V. H. Wysocki, S. S. Saavedra

**4:20** . Surface DNA melting and hybridization as diagnostic tool for drug-DNA interactions. **I. Belozerova**, R. Levicky

**4:40** . High content, flow-based evaluation of platelet function using microfluidic devices. **R. R. Hansen**, A. A. Tipnis, T. C. White-Adams, J. A. Di Paola, K. B. Neeves

#### WEDNESDAY EVENING

#### Emerging Environmental Contaminants: Chemistry and Toxicology

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#### THURSDAY MORNING

Section A

#### Advances in Analytical Spectroscopy

C. Larive, *Organizer, Presiding*

**9:00** . Identification and spectroscopy of degradation products from fluoroquinolone antibiotics in ozonated wastewater. **C. Liu**, W. Jiang, V. Nanabolina, G. V. Korshin

**9:20** . Environment-responsive modulation of light via nanofiber junctions. **I. Yoon**, K. Kim, S. E. Baker, D. Heineck, S. C. Esener, D. J. Sirbulu

**9:40** . Detection limits in surface-enhanced nonlinear spectroscopy. **J. P. Camden**

**10:00** Intermission.

**10:20** . Solvent removing LC-FTIR: A new instrument for characterizing polymers, copolymers and complex mixtures. W. W. Carson, **F. B. Prulliere**, M. Zhou, T. Kearney

**10:40** . Synthesis and characterization of multifunctional ionic liquid crystals. **C. Lu**, S. Das, M. Li, I. Warner

**11:00** . Physicochemical investigation of methylene chloride- and phenol-based paint strippers in model military coating systems. **C. N. Young**, C. R. Clayton, K. E. Watson, J. H. Wynne, J. P. Yesinowski, Y. H. Han

**11:20** . NMR analysis of heparin hydroxy and sulfate protons. **C. Beecher**, D. Langeslay, S. Béni, C. K. Larive

Section B

#### Advances in Analytical Separations

C. Larive, *Organizer*

G. Barding, *Presiding*

**8:30** . Planar cell chromatography. B. Chen, G. Kumar, C. Ho, **C. Co**

**8:50** . Elastomeric microparticles for acoustic-mediated biomolecular separation. **L. M. Johnson**, L. Gao, G. P. Lopez

**9:10** . Characterization of poly(2-oxazoline)s by liquid chromatography under critical conditions. **C. Weber**, A. Baumgaertel, N. Fritz, G. Festag, K. Kempe, R. Hoogenboom, U. S. Schubert

**9:30** . Detection of toxic compounds using a microfabricated thin film nitrogen-phosphorus thermionic detector. **R. F. Hess**, R. J. Simonson, M. Moorman, T. Boyle, L. M. Steele, C. R. Lockhart, M. Brumbach

**9:50** . Effect of onium buffer additives on electroosmotic flow. **A. L. Morris**, C. R. Harrison

**10:10** Intermission.

**10:30** . Cation separation and preconcentration in ion chromatography using columns containing Cyclen and Cyclen-Resorcinarene derivatives. **N. Li**, C. English, A. Eaton, A. Grillespie, T. C. Ence, T. J. Christensen, R. G. Harrison, J. D. Lamb

**10:50** . Using non-ionic surfactants towards enrichment of high purity semiconductor single wall carbon nanotubes (SWNTs) by column chromatography. **V. Gangoli**, J. Azhang, S. A. Gelwick, R. H. Hauge, M. S. Wong

**11:10** . Influence of alpha-synuclein on Fe(III)-catalyzed dopamine oxidation species by using Ion Pair Chromatography and Orbitrap mass spectrometry. **E. Y. Li**, G. B. Yagnik, D. Jiang, F. Zhou

**11:30** . Quantitative analysis of humectants in tobacco products using gas chromatography with simultaneous mass selective and flame ionization detection. **C. L. Rainey**, D. Z. Bezabeh

#### THURSDAY AFTERNOON

Section A

#### Advances in Surface Analysis

C. Larive, *Organizer, Presiding*

**1:30** . Quantification of functional group density in diazonium-grafted monolayers. **X. Zhan**

**1:50** . *In-situ* probe of gate dielectric-semiconductor interfacial order in organic transistors: Origin and control of large performance sensitivities. **S. R. Walter**, J. Youn, J. Emery, S. Kewalramani, A. Facchetti, M. J. Bedzyk, T. J. Marks, F. M. Geiger

**2:10** . Following the kinetics of a chemical reaction in ultrathin supported polymeric films by reliable mass density determination with x-ray reflectivity. **E. Kontturi**, A. Lankinen

**2:30** . Surface and interface analysis of polymer composites facilitated by ultrafast laser ablation. **C. N. Young**, C. R. Clayton, J. P. Longtin, R. Granata

**2:50** . Determining the absolute orientation of side chains on a polymer surface: a nonlinear optical approach. **P. A. Covert**, K. C. Jena, S. A. Hall, D. K. Hore

**3:10** Intermission.

**3:20** . Hardening and softening of nanometer and millimeter sized organic cocrystals in a single-crystal transformation. **S. Ghorai**, C. Karunatilaka, B. Dejan-Kresimir, L. MacGillivray, A. Tivanski

**3:40** . Real-time monitoring of the aging of single copper nanoparticles: Dark field microscopy and plasmon resonance rayleigh scattering spectroscopy. L. Qin, **Y. Long**

**4:00** . Solvent oligomerization during SEI formation in Li-ion battery anodes. **H. Tavassol**, J. W. Butcher, G. A. Ferguson, L. A. Curtiss, A. A. Gewirth

**4:20** . Synthesis of Palladium Nanoparticles via Chemical Reduction for Electrooxidation of Ethanol in Alkaline Medium. **I. Feliciano**, L. Arroyo, D. Diaz, L. Cunci, N. Rivera, C. Cabrera

Section B

#### Advances in Mass Spectrometry

C. Larive, *Organizer*  
C. Beecher, *Presiding*

**1:30** . Combining lipidomics and proteomics by MALDI-MSI. **A. C. Crecellius**, F. von Eggeling, U. S. Schubert

**1:50** . Quantitative LC-MS/MS used as a tool in the development of immunoassays. **C. S. Ramsay**, H. Xie, P. Ozaeta, J. Fishpugh

**2:10** . Quantification of HPLC-separated peptides and proteins by spectrofluorimetric detection of native fluorescence and mass spectrometry. **S. Saraswat**, B. Snyder, D. Isailovic

**2:30** Intermission.

**2:50** . Characterization and quantification of gas phase peroxides by exploring reagent ion chemistry using chemical ionization mass spectrometry and Ab-Initio calculations. **I. K. Silwal**, B. G. Heikes, D. W. O'Sullivan

**3:10** . Challenge to determining absolute configuration based on mass spectrometry with the aid of chiral auxiliary group. **Y. Shioiri**, Y. Ito, O. Kanie

**3:30** . Mass spectrometry studies of dyed textile materials. **F. Alihosseini**, J. Lango, B. D. Hammock, **G. Sun**

**3:50** . Assessment of pesticides in drinking water using disposable pipette extraction (DPX) followed by GC/MS analysis. **H. Guan**, P. G. Kunuru, A. Fatima, S. Nagabandi

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