



## **Workshop on Optimizing Performance and Maximizing Productivity When Measuring Heavy Metals in Cannabis and Hemp by Inductively Coupled Plasma Mass Spectrometry**

**When:** Thursday, October 3<sup>rd</sup>, 2019

**Time:** 8.30 am – 4.30 pm

**Where:** Sheraton Columbia Town Center Hotel, 10207, Wincopin Circle, Columbia, MD 21044

### **Agenda**

**8.30 am – Registration and Coffee**

**9.00 – Welcome/Review of Agenda** – Lori Dodson, MMCC Deputy Director, Robert Thomas, Scientific Solutions

**9.15 am – Development of ICP-MS: A 35 year journey** – Robert Thomas, Scientific Solutions, Gaithersburg, MD

**10.00 am - An optimized method for analyzing many different cannabis-based products by ICP-MS** – Andrew Fornedal Shimadzu, Columbia, MD

**10.45 am – Break**

**11.00 am – The United States Pharmacopeia (USP) position on standard procedures for cannabis** – Dr. Nandu Sarma, Director of Herbal Medicines, USP, Rockville, MD

**11.15 am - General lab cleanliness and how to minimize contamination** – Patti Atkins, Spex Certiprep, Metuchen, NJ

**11.45 am - Microwave sample preparation and clean chemistry solutions for accurate trace metals analysis** – Laura Lawlor, Milestone Inc, Shelton, CT

**12.30 pm – Lunch**

**1.15 pm – What's new at the Cannabis Science Conference** – Josh Crossney, Founder and President, CSC

**1.30 pm - Maintenance of sample introduction system and maximizing sample throughput** – Dr. Ryan Brennan, Justin Masone, Glass Expansion, Pocasset, MA

**2.15 pm - Testing Electronic Nicotine Delivery (END) vaping devices for elemental impurities** – Dr. Steven Pappas, Tobacco Inorganics Group, CDC, Atlanta, GA

**3.00 pm – Break**

**3.15 pm - ICP-MS Cone Maintenance for Enhanced Instrument Lifetimes** – Lawrence Neufeld, Spectron Inc, Ventura, CA

**4.00 pm - Quality Assurance Programs (QAPs) and Certified Reference Materials (CRMs) for Cannabinoids** - Dr. Melissa Phillips, Chemical Sciences Division, NIST, Gaithersburg, MD

**4.15 pm – Wrap up//Q&A**

## **Brief Biographies of Invited Speakers (in order of presentations)**

### **Robert J. Thomas**

Robert (Rob) Thomas is the principal of Scientific Solutions, a consulting company that serves the training, application, marketing and writing needs of the trace element user community. He has worked in the field of atomic and mass spectroscopy for more than 45 years, including 24 years for a manufacturer of atomic spectroscopic instrumentation. He has served on the American Chemical Society (ACS) Committee on Analytical Reagents (CAR) for the past 19 years as leader of the plasma spectrochemistry, heavy metals task force, where he has worked very closely with the United States Pharmacopeia (USP) to align ACS heavy metal testing procedures with pharmaceutical guidelines. Rob has written almost 100 technical publications, including a 15-part tutorial series on ICP-MS. He is also the editor and frequent contributor of the Atomic Perspectives column in Spectroscopy magazine. In addition, he has authored four textbooks on the fundamental principles and applications of ICP-MS and is currently researching and writing a new book, which focuses on the measurement of heavy metals in cannabis and hemp. Rob has an advanced degree in analytical chemistry from the University of Wales, UK, and is also a Fellow of the Royal Society of Chemistry (FRSC) and a Chartered Chemist (CChem).

### **Jonathan (Jon) Peters**

Jonathan Peters is Product Manager for the Elemental Analysis product Line at Shimadzu Scientific in Columbia, MD. He has fifteen years of experience with marketing analytical instrumentation and sampling accessories in the field of AA, ICP-OES, ICP-MS, TOC and X-Ray analytical instrumentation. Before joining Shimadzu in 2017, he was previously Automation Product Manager at Teledyne Cetac Technologies in Omaha, NE. (Note: Dr. Andrew Fornadel, one of Jon's colleagues at Shimadzu gave the presentation).

## **Patti Atkins**

Patricia Atkins is a senior applications scientist. She is a graduate of Rutgers University in NJ and was laboratory supervisor for Ciba Specialty Chemicals in the Water Treatment Division. Patricia later accepted a position conducting research and managing an air pollution research group within Rutgers University's Civil & Environmental Engineering Department. In 2008, Patricia joined SPEX CertiPrep as a senior application scientist in our certified reference material's division and spends her time researching industry trends and developing new reference materials. She is a frequent presenter and speaker at numerous conferences including NACRW, NEMC, PittCon and AOAC and published author with her work appearing in various journals and trade publications including Spectroscopy, LCGC and Cannabis Science and Technology where she is a columnist for analytical issues in cannabis testing.

## **Laura Lawlor (Thompson)**

Laura Lawlor is the National Sales Manager for Milestone, Inc. She manages a technical sales force that is focused on solutions for analytical laboratories in a wide variety of markets. Milestone products include several offerings in microwave assisted digestion, microwave assisted extraction, clean chemistry, as well as direct mercury analysis. Prior to joining Milestone, Laura held various positions at a large analytical instrument company for over 17 years, including global ICP-OES product manager. Additionally, she spent several previous years in contract labs as an ICP/AA/Sample Preparation specialist and manager. Laura holds a Master's degree in analytical chemistry from North Carolina State University, specializing in atomic spectroscopy techniques.

## **Ryan Brennan, PhD**

**Ryan Brennan** is the CEO for Glass Expansion, Inc., a manufacturer of ICP-OES and ICP-MS sample introduction components and accessories. Before taking on the role of CEO, Ryan was the Product and Marketing Manager for Glass Expansion, Inc. Prior to joining Glass Expansion, Inc., Ryan worked at the National Institute of Standards and Technology (NIST) as a NRC Post-Doctoral Research Associate. Ryan received his doctorate in analytical chemistry from George Washington University.

## **Justin Masone**

**Justin Masone** is the Product Manager for Glass Expansion Inc., a manufacturer of ICP-OES and ICP-MS sample introduction components and accessories. Prior to joining Glass Expansion, Justin worked as a Technical Sales Representative for Microwave Digestion at Anton Paar, as well as a Sr. Product Specialist in the Elemental Spectroscopy group at Shimadzu. Justin received his bachelor's degree in chemistry from Johns Hopkins University.

## **R. Steven (Steve) Pappas, PhD**

**Steve Pappas** earned his B.S. in Chemistry at Middle Tennessee State University and completed his doctoral training in Biochemistry at Vanderbilt University. After faculty positions at Middle Tennessee State University

and Georgia State University, he was employed at the Centers for Disease Control and Prevention (CDC) to develop methods for analysis of toxic metals in urine and blood for emergency response and state health department laboratory training. In the second phase of his work at CDC, he became responsible for development of methods within the ISO 17025 framework for analysis of toxic metals in tobacco and smoke, during which he became the Tobacco Inorganics Group Project Lead. More recent responsibilities have included development of methods for analysis of metals in electronic cigarette liquids and aerosols, and to characterize particles on tobacco, in smoke, and in electronic cigarette aerosols using ICP-MS, Dynamic Light Scattering, and Scanning Electron Microscopy with Energy Dispersive X-ray spectroscopy. He oversees method development and validation, ISO 17025 accreditation, interaction with database programmers, and is responsible for publishing and interpreting data in terms of public health risks. Steve has earned three group honor awards for Excellence in Laboratory Research, and an individual Innovation award for research on characterization of particles in electronic cigarette aerosols.

In addition to authoring application manuscripts, Steve has written Annex 1, Toxic Metals in tobacco and in Cigarette Smoke in World Health Organization Technical Report Series 967 on inflammation and sensitization responses in animal and human studies, a Metallomics review on the same topic, and the toxic metals section in "A Report of the Surgeon General: How Tobacco Smoke Causes Disease (2010)."

### **Lawrence Neufeld**

Lawrence Neufeld is the President and CEO of Spectron, Inc., the largest manufacturer of ICP-MS cones in the world and direct vendor to four of the top five producers of ICP-MS systems. Lawrence joined VG Elemental (now Thermo Fisher) in 1988 as the second US based Field Engineer for ICP-MS, soon after leaving his Research Associate position with the Department of Biochemistry at Stony Brook University. Based on his strong analytical background, Lawrence became the Accessories Specialist for North America in the early 1990s, supporting hyphenated techniques (LA-ICP-MS, ETV-ICPMS, and DSN-ICP-MS). Lawrence left VG/Thermo Fisher as Senior Product Engineer in 2000 to join VHG Labs (now part of LGC Standards) as Technical Director, before being recruited by New Wave Research in 2001, as Product Manager of their Laser Ablation group. Since 2006, Lawrence has used his varied technical skills to grow and enhance Spectron in support of both our OEM and direct customers.

### **Melissa Phillips, PhD**

Melissa M. Phillips has been a research chemist in the Chemical Sciences Division at the National Institute of Standards and Technology (NIST) since 2008. She is involved in the certification efforts for food and dietary supplement Standard Reference Materials (SRMs) and is a coordinator of the Dietary Supplement Laboratory Quality Assurance Program (DSQAP), the Health Assessment Measurements Quality Assurance Program (HAMQAP), and the Food Reference Materials Program. Her interests include development of new analytical methods for the determination of marker compounds, vitamins, and contaminants in foods and dietary supplements, and improving the measurement capabilities of the food and dietary supplement communities

using reference materials and quality assurance programs. Melissa obtained a B.S. in Chemistry, and M.S. in Forensic Chemistry, and a Ph.D. in Analytical Chemistry from Michigan State University. Melissa is a member of the AOAC INTERNATIONAL Official Methods Board, Editorial Board, and is a fellow of AOAC INTERNATIONAL.