

**V-1 Sunday Evening, July 21, 2019, 6:15 p.m. to 7:15 p.m.**

**Location: Vista Ballroom**

**SHIMADZU SCIENTIFIC  
INSTRUMENTS, INC.**

### **What's in my Hemp? The good, the bad, and the toxic!**

*Volker Bornemann, Avazyme, Inc., 2202 Ellis Rd., Suite A, Durham, NC 27703, USA;  
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Hemp, also known as *Cannabis sativa*, has been prohibited to be grown in the US for the past 70 years, and was considered for the most part a schedule I controlled substance by the US Drug Enforcement Administration. This has changed at the beginning of this year with the enactment of the 2018 Farm Bill. Now, industrial hemp is “just another crop” in the United States and subject to the usual regulations for crops and crop derived products, like food, feed, cosmetic products, and more. Testing emerges as a critical factor to ensure product safety and product quality, and that the hemp derived products are safe for the environment, humans, pets, and livestock. This includes pesticide uses in hemp, which have to be registered with the US EPA and the individual State regulatory agencies. Testing is also needed to ensure compliance with all applicable laws and regulations. A holistic approach to testing is needed to test for cannabinoid and terpene profiles, adulterants like heavy metals, mycotoxins, pesticide residues, residual solvents, pathogens, nutritional composition and equivalency for ingestible food and feed products, and more.

Avazyme, Inc. is a customized testing solution provider offering field and laboratory testing, product development, and expert consulting services to agriculture and the entire food value chain. Avazyme provides fast, accurate and reliable answers to ensure product safety and high product quality for food, feed, cosmetics, nutraceutical, and pharmaceutical products.

**V-2 Monday, July 22, 2019, 7:15 to 8:15 am**

**WATERS CORPORATION**

**Location: Vista Ballroom**

### **Part 1: Determination of Polar Pesticides as Residual Impurities in Various Formulated Pesticide Matrices by LC-MS/MS**

*Chasity Love-Nkansah Ph.D., Chemist 5, Syngenta, Greensboro, NC, USA*

A common threat for most agricultural companies is the possibility of cross-contamination of final products with residual impurities during manufacturing processes. Cross contamination of final products can result in substantial crop loss, possible regulatory violations, and significant damage to the company's reputation. The current practice for testing for residual impurities is to conduct targeted analysis for the active ingredient (s) in the preceding product. Currently, the analysis of polar pesticides are challenging and time-consuming due to them being highly soluble in water, their ionic nature, and various extraction difficulties.

For this presentation, we will show the application of a Waters Torus DEA column for the determination of underivatized polar pesticides in different formulated matrices and rinse water samples. This is an alternative simpler method from the common practice of tedious FMOc derivatization. Waters Acquity UPLC H-Class coupled with a Xevo TQ MS was used for all of this work. The suggested protocol to activate and condition the Torus DEA column with a disodium EDTA solution was carried out to achieve better performance. We will show that that method achieved suitable ppm level detection, reproducible retention times for various pesticides, specificity in complex matrices, and linearity.

### **Part 2: Tips for Faster Sample Preparation**

*Jeremy Shia Ph.D., Senior Product Manager Consumables Group, Waters Corporation, Milford, MA, USA*

Jeremy will explore some recent work our scientific operations team has been working on to speed up your sample prep workflows. He will present data on one and two step workflows for the rapid removal of matrix interferences. Stop by our booth later for a personal demonstration of the cartridge in action with an interactive experiment

## Part 1: Optimizing Sample Preparation in Pesticides Analysis for Cannabis

*Jessica Westland, Agilent Technologies*

Many U.S. state-regulated pesticides lists for cannabis can be analyzed exclusively by LC/MS/MS. Notable exceptions include California, Florida, and Nevada, where GC/MS/MS is also required. The states requiring GC/MS are expected to grow as more compounds and lower detection limits are required. In this work, the detection and quantitation of all LC-amenable pesticides and mycotoxins were reliably met by at least 50% of the current California legislative safety action limits in cannabis dried flower samples (limits of detection (LODs) range between 0.5 to 50 ppb; Malathion's LOD = 100 ppb). Forty-three GC-amenable pesticides regulated by the Bureau of Cannabis Control in California met the established limits of quantitation (LOQs) with the Agilent 8890 GC combined with an Agilent 7010B triple quadrupole GC/MS system. The Agilent standardized sample preparation procedure aligned with the Agilent multiplatform approach provides a rapid return on investment (ROI) and a stable foundation to meet current and future testing requirements.

## Part 2: LC-MS/MS vs. LC-MS/MS & GC-MS/MS for the Certain Analysis of Pesticides in Cannabis Flower

*Anthony Macherone, Agilent Technologies & The Johns Hopkins University School of Medicine*

Pesticide analyses in cannabis flower is complicated because of the multitude of co-extractive endogenous chemicals and target analytes like pentachloronitrobenzene (PCNB) that are not amenable to electrospray ionization (ESI). To overcome this issue, it has been suggested to use negative atmospheric pressure chemical ionization liquid chromatography-tandem mass spectrometry (Ni-APCI LC-MS/MS) for compounds like PCNB to conform to a single analytical platform approach. However, this approach results in non-selective, non-linear precursor / product ion pairs that yield poor statistical regression coefficients and do not meet regulatory requirements in U.S. states like California. In this presentation we use using Ni-APCI LC-time-of-flight mass spectrometry (Ni-APCI LC-QTOF) to prove the correct ionization mechanism for PCNB and evaluate the appropriateness of this analytical technique for PCNB in terms of selectivity, sensitivity, and the fit of the coefficient of determination compared to GC-MS/MS methodologies.

**V-4 Tuesday, July 23, 2019 7:00 to 8:15 am**

**BRUKER**

**Location: Vista Ballroom**

## **Mass Spectrometric Solutions for Accurate Screening and Quantitation of Chemical Residues in Food and the Environment**

*Artem Filipenko, Ph.D., Bruker Scientific, Billerica, USA*

With increasing demands for lower detection thresholds to cover hundreds of pesticides originating from numerous sample types, accurate and reliable pesticide screening is a critical and complex analytical task. To meet these challenging demands, Bruker has developed new UHPLC-QTOF and GC-APCI-QTOF based solutions that will be discussed at the seminar.

Fast and comprehensive full scan accurate mass screening and quantitation technique has become an excellent tool for food control and environmental analysis. This technique takes advantage of both targeted and non-targeted workflows, as well as data mining and retrospective analysis. The new TargetScreener HR 4.0 application kit is based on the Bruker QTOF platform. For maximum flexibility and depending on the application, TargetScreener can be operated in either UHPLC-QTOF or GC-APCI-QTOF configurations interchangeably. A central part of this solution is the new TASQ 2.1 Screening & Quantitation Software for rapid data processing that includes predeveloped analytical methods. Rigorously curated TargetScreener databases is pivotal for minimizing false positives and negatives and includes more than 3,000 entries relevant for food safety, environmental protection, and other screening and research applications.

**V-5 Tuesday, July 23, 2019, 12:15 to 1:15 pm**

**LECO CORPORATION**

**Location: Vista Ballroom**

**LECO Corporation's NACRW Midsummer Classic, a Lunchtime Double Header:**

***"If you don't know where you're going, you might not get there."* Yogi Berra**

**Part 1:**

*Bob Nelson, Woods Hole Oceanographic Institute*

30-years pre-Deepwater Horizon oil spill an oil platform, Ixtoc-I, operating in the Bay of Campeche failed and spilled an estimated 3.5 M gal. into the Gulf of Mexico. This, second largest, lesser known oil spill has been investigated as a predictor for the 2010 Deepwater Horizon spill of 4.9 M gal. Using LECO's high resolution multidimensional technology to study Ixtoc-I samples, experts from Woods Hole Oceanographic Institute will tell us more on their findings into petroleum weathering across decadal time scales and how the data can be used to predict long-term fate of the crude oil released during the Deepwater Horizon disaster.

**Part 2:**

*Todd Richards, LECO Corporation*

In 2016 the EPA announced their ENTACT (EPA's Non-Target Analysis Collaborative Trial) program. The goals of this program were to identify which methodologies are appropriate for non-target detection and identification of common LC & GC amenable exposome compounds. This brief presentation will highlight on LECO's approach to non-target work, the strategies implemented and the tools that were created as a direct result of our participation in this trial.

**V-6 Wednesday, July 24, 2019, 7:15 to 8:15 am**

**SCIEX**

**Location: Vista Ballroom**

**A New Generation in Chemical Residue Quantitation: Single Injection Analysis of 530 Mycotoxins, Metabolites and Other Emerging Masked Compounds**

*Oscar G. Cabrices, Market Development Manager, Food/Beverage & Environmental Testing  
SCIEX*

Success and growth of chemical residue testing laboratories often depends on their versatility to manage the diversity of samples received. High throughput quantitation without compromising sensitivity and robustness has always been the challenge for these labs due to the wide variety of processing steps and chromatography methods samples may require. In this seminar, we'll introduce the new SCIEX Triple Quad™ 5500+ QTRAP® Ready LC-MS/MS System designed for quantitative chemical residue analysis. A novel analytical workflow that utilizes rapid polarity switching for high throughput quantitation of 530 mycotoxins, metabolites and other emerging masked compounds in barley and corn extracts will be described.

**V-7 Wednesday, July 24, 2019, 12:00 to 1:00 pm**

**PICKERING LABORATORIES**

**Location: Vista Ballroom**

**Part 1: Introduction of Onyx PCX – the newest addition to Pickering Laboratories' integrated family of post-column derivatization instruments, chemistry and support**

*Maria Ofitserova, PhD, Senior Research Chemist*

Post-column derivatization technique is designed to enhance sensitivity and selectivity of detection. We demonstrate how Pickering Laboratories' Onyx PCX post-column derivatization system improves detection of variety of compounds, including Glyphosate, Mycotoxins, carbamates pesticides, and polyether antibiotics in complex matrices. Optimized instrumentation together with complete application support ensures ease of use, ruggedness and reliability of analysis.

**Part 2: Analysis of Hemp Plant and Hemp-Containing Products using Post-Column Derivatization**

*Sareeta Nerkar, PhD, Research Chemist*

Hemp farming Act of 2018 legalized hemp production and allowed sales of hemp plant and hemp-based CBD-containing products. With that came the need to test hemp products for contaminations as well as potency. We present post-column derivatization methods for analysis of mycotoxins and cannabinoids in dry hemp plant, full spectrum hemp oils, and full spectrum hemp edible products.