Department of Chemistry Seminar Series Fall 2022

Friday, November 3, 2022, 3:30 PM - HS1 O112 (Health Sciences)
Host: Dr. Tamra Legron-Rodriguez

Analytical Tools to help Forensic Laboratories in Cannabis Testing

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The legal cannabis market in the US grossed $18.3B, which can be attributed to the passage of the 2018 Farm Bill that defined hemp as cannabis containing 0.3% or less of decarboxylated-Δ9-tetrahydrocannabinol (Δ9—THC) and removed hemp from the US Drug Enforcement Agency controlled substance list. As a result, the legal cannabis market exploded with a large production of floral hemp plant that is used to produce a wide range of finished products. Forensic laboratories were dependent upon qualitative measurements prior to the 2018 Farm Bill and are now required to quantitatively measure decarboxylated Δ9-THC in seized cannabis to differentiate between hemp or marijuana, despite the lack of analytical tools. In response, the National Institute of Standards and Technology (NIST) developed an integrated measurement services program for cannabis to ensure the quality of routine analysis in forensic laboratories, third party testing companies, and throughout the cannabis industry. The tools developed by NIST include the development of fit-for-purpose analytical methodologies, standard operating procedures/training videos, administration of a series of interlaboratory studies through our Cannabis Laboratory Quality Assurance Program (CannaQAP), and development of Reference Materials (RMs). This presentation will provide an overview of the issues encountered in the development of three analytical methods (GC-MS, LC-PDA, and LC-MS/MS) for the determination of Δ9-THC and other cannabinoids in hemp and marijuana plant and oil samples. In addition, a methanol extraction method was optimized providing the complete extraction in less than 15 minutes. Data will be provided demonstrating the methods ability to distinguish between hemp and marijuana with values around the 0.3% federal threshold as part of CannaQAP and direct comparisons will be provided to participants of the interlaboratory studies.