



**ACS** Local Section  
Southern Nevada

**American Chemical Society (ACS) Seminar, Friday, October 16, 2020,  
5:30 pm to 6:30 pm Seminar**

**Zoom Meeting [Link](#)**

**Meeting ID: 486 795 5521**

**Password: ACS1234**

**The Science of Cannabis Analysis**

**Darryl Johnson, PhD - Scientific Director**



**Las Vegas, Nevada**

#### **Abstract**

Currently, 33 states and the District of Columbia have legalized some form of medical and/or adult-use cannabis. With the legalization of this Schedule 1 drug, many questions have been raised regarding product and consumer safety. Class action lawsuits and negative press over microbiological and pesticide contaminated marijuana has plagued the industry and highlighted the need for mandatory safety testing.

Nevada has been at the forefront of cannabis analysis, requiring all products to undergo the world's most stringent safety testing requirements prior to sale. This includes screening all products for seven classes of microbiological contaminants, 24 pesticides/fungicides/growth regulators, four heavy metals, and five mycotoxins. For cannabis extracts, residual levels of four hydrocarbon solvents are measured for each sample. Products that fail to meet safety requirements are prohibited from sale and must be destroyed.

With the development of cannabis safety and potency testing laboratories, new employment opportunities have arisen for a variety of scientific disciplines, including chemistry and microbiology. Cannabis analysis utilizes many common analytical and microbiological instruments and techniques including high performance liquid chromatography (HPLC), gas chromatography-mass spectrometry (GC-MS), LC and GC triple quadrupole mass spectrometry (LC-QQQ, GC-QQQ), and quantitative polymerase chain reaction (qPCR) analysis. This seminar will focus on cannabis safety and potency testing, survey the instruments and techniques utilized by laboratories, and introduce the audience to some of the numerous opportunities that will become available for scientists in this brand-new industry.

#### **Biosketch**

Darryl Johnson, PhD is the Scientific Director at Ace Analytical Laboratory, an ISO 17025:2017 accredited cannabis safety and potency testing laboratory in Las Vegas, Nevada. Over the past 4 years, Ace Analytical has analyzed more than 30,000 cannabis samples using internally developed and validated assays to quantitatively measure pesticides/growth regulators, heavy metals, mycotoxins, residual solvents, microbiological contaminants, cannabinoids, and terpenes in cannabis flowers, extracts, and edibles. In addition, Dr. Johnson has been a contributing author for Vegas Cannabis Magazine and served on the Laboratory Working Group for the Governor's Task Force for the implementation of Question 2 (legalization of adult-use marijuana in Nevada).

Dr. Johnson received his PhD in bioanalytical chemistry from the University of Georgia in 2013. While at UGA, he worked under Dr. Ron Orlando at the Complex Carbohydrate Research Center developing novel separation methodologies for high-throughput mass spectrometry-based proteomic analysis. Following graduation, he took a Research Chemist/ORISE Fellowship position at the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia. During his time at the CDC, he was part of the Special Topics Team in the Chemical Terrorism Method Development Laboratory, responsible for developing bioanalytical assays to measure human exposure to organophosphorus nerve agents. Dr. Johnson has authored nearly 20 peer-reviewed scientific publications and was part of a team of scientists awarded the CDC's Excellence in Emergency Response International award in 2015.