# Untargeted Analysis of Psychedelic and Non-Psychedelic Mushrooms using Liquid Chromatography-Quadrupole Time-of-Flight Mass Spectrometry

Sabrina Islam<sup>1</sup>, Liden Tiffany<sup>2</sup>, Roman Goff<sup>1</sup>, Kevin A. Schug<sup>1</sup> 1. The University of Texas at Arlington, Arlington, Texas; 2. Shimadzu Scientific Instruments, 7102 Riverwood, Columbia MD

#### **Abstract**

Psychedelic mushrooms are used to treat psychological disorders like depression, anxiety, and PTSD. Psilocybin, psilocin, and other tryptamines distinguish psychedelic mushrooms from the nonpsychedelic ones. This study identified additional chemicals found in psilocybin mushrooms but not non-psilocybin ones that may cause psychedelic effects. Psilocybin and ordinary mushroom samples were analyzed in Liquid Chromatograph Quadrupole Time- of- Flight mass spectrometer and data was analyzed in MS-Dial to find essential features. MS-Finder is used to find out the potential compound from the key features found. Some key features were found in psilocybin mushroom that distinguish itself from non- psychedelic ones.



## Samples

Non-Psychedelic Mushrooms

Shiitake Caps

Button

Wild

#### Psychedelic Mushrooms

- Creeper
- Texas YellowBlue Meanie
- Thai Cubensis
- B+

# Sample Preparation



\*Step c, d & e repeated twice, and supernatant was collected

### **Instrumentation**



Fig: Shimadzu Naxera X2 UHPLC coupled to QToF 9030

## LC Method

0.0-1.0 min: 5% B, 1.0-10.0 min: 5-100% B, 10.0-12.0 min: 100% B, 12.0-15.0 min: Re-equilibration Total Flow: 0.4 ml/ min

#### Injection Volume 5 uL

Column

Raptor Biphenyl 100× 2.1mm, 2.7 μm

## MS Method

Ionization mode: ESI Nebulizing Gas: 2.0 L/min Heating Gas: 10 L/min Interface Temp: 300 °C Desolvation Temp: 526 °C Interface Voltage: -3.50 kV Drying Gas: 10 L/min DL: 250 °C Heating Block Temp: 400 °C Mass Range: (100-1000) m/z Loop Time: 0.740 sec Q1 Resolution: 21 m/z (centered) CE Spread: 25



## **Future Works**

- Untargeted & Targeted analysis with HILIC & Inert-coated columns.
- Supervised analysis to investigate compositional differences among psychedelic mushroom strains.
- □ Analyzing psychedelic mushroom sample stability.



References: 1. Roman Goff, Morgan Smith, Sabrina Islam, Sue Sisley, Jonathan Ferguson, Scott Kuzdzal, Sunil Badal, Arun Babu Kumar, Uma Sreenivasan, Kevin A. Schug, Determination of psilocybin and psilocin content in multiple Psilocybe cubensis mushroom strains using liquid chromatography–tandem mass spectrometry, Analytica Chimica Acta, Volume 1288, 2024, 342161, ISSN 0003-2670, https://doi.org/10.1016/j.aca.2023.342161.

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