TRAVIS HARDING, MARK FLOOD, ANDREAS BAUR, and KRISTY HENSON. Department of Natural Sciences, Fairmont State University, Fairmont, WV, 26554. Determining the Concentration of Morphine and Codeine in Poppy Seeds for Drug Test Defense.

The purpose of this research was to determine the concentration of opiates, morphine and codeine, in poppy seeds in effort to combat the “poppy seed defense”. Morphine and codeine are naturally occurring substances belonging to a class of drugs labeled opioid analgesics, commonly known as narcotics. There has been an increase in concerns involving false-positive opiate drug test. Distinguishing between legitimate dietary poppy seed ingestion versus non-prescribed opiate or heroin abuse is important for individuals subject to routine drug testing. Poppy seeds were purchased from supermarkets and were mechanically ground up by either 1) a blender or 2) a mortar and pestle, which best simulates human mastication. The ground up seed products were placed in a solution matrix to simulate a human oral cavity (target concentration of 30 ng/mL). Morphine and codeine concentrations from the samples will be tested using Thin Layer Chromatography, immunoassay (Opiate ELISA), and a validated Gas Chromatography-Mass Spectroscopy (GC-MS) Selected Ion Monitoring (SIM) system. The screening cutoff concentration ranges from 0 ng/mL to 40 ng/mL. Preliminary results from previous constructed experiments showed a positive color change for the opiate assay from blue to yellow within one hour (National Institute on Drug Abuse Research). The average absorbance at a dual wavelength of 450 nm and 650 nm was 1.238 correlating to a morphine concentration of about 5.1 ng/mL. Initial GC-MS results showed morphine and internal standard morphine-D3 had mass to charge ratios of 432 m/z and 429 m/z with an average concentration of 7.5 ng/mL respectively. This research was made possible by NASA West Virginia Space Grant Consortium, Training Grant #NNX15AI01H.