



U.S. Department of Justice

Office of Justice Programs

Office of Communications

Washington, D.C. 20531

GRANT NOTIFICATION

Grant Number: 2015-R2-CX-0032

Name & Address of Recipient: West Virginia University
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Title of Program: FY16 Office of Investigative and Forensic Sciences Continuations

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Amount of Award: \$ 49,977 Date of Award: 09/12/2016

Awarding Agency: National Institute of Justice
Sherry Cochran

Supplement: 01

Statutory Authority for Program:
FY15(NIJ - S&LLEA DNA/Other Forensics) Pub. L. No. 113-235, 128 Stat. 2130, 2193; 28 USC 530C

Impact/Focus: Research CFDA Number: 16.560

Project Description:

As submitted by the applicant: Synthetic cannabinoids have become a ubiquitous challenge in forensic toxicology and seized drug analysis. Aside from various degrees of impairment, acute toxic effects associated with these drugs include tachycardia, seizures, depression, possible suicidal tendencies, and the onset of psychotic episodes. To date, these effects are poorly understood. These drugs are ingested primarily by smoking, which introduces additional complexity to the problem of understanding and characterizing acute and chronic toxic effects as well as degrees and types of impairment that occur after ingestion.

This objective of this proposal is to evaluate the toxicity of confirmed pyrolytic products produced from the smoking process of selected representative synthetic cannabinoids. Recent work in our laboratory has shown that some of the thermal degradation products would be expected to bind with the cannabinoid receptors, an unexpected finding. Additionally, recent literature reports describe the detection of thermal degradation of the synthetic cannabinoids in traditional toxicological matrices of blood and urine so the route of ingestion for these drugs is clearly an important contributor to their acute and potentially chronic toxic effects.

Toxicity of thermal degradation products (confirmed through recent literature and exact mass characterization in our laboratory) will be evaluated and compared to parent and metabolic compounds to assess the overall effects of abuse. The data will be used to develop detailed study of the mechanism of toxicity in various organs including the brain, lung, liver, buccal, and heart. This information is essential for understanding toxicological responses, degrees of incapacitation, prediction of acute and chronic toxic responses, and for



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developing assays for the appropriate body fluids and organs. The analytical instruments and protocols used in the study (GC/MS, LC/MS/MS, LTQ-FTICR/MS, TECAN Infinite M1000 plate reader with fluorescence, and BioPlex 200 Flow Cytometer) are all in place and no new equipment or instrumentation is needed for this project. All analytical protocols will be validated as per the Standard Practices for Method Validation in Forensic Toxicology. All of the expertise necessary for completion of the project is available through the student's established research committee and the PI's research group has many years of experience in forensic chemical analysis including the analysis of smoked drugs of abuse, working with liver microsomes, method development, and toxicological analyses.

Note: This project contains a research and/or development component, as defined in applicable law.

nca/ncf.

For more information about this grant, contact the Office of Justice Program's Office of Communications at 202/307-0703.