# Real-Time Sample-Mining and Data-Mining Approaches for the Discovery of Novel Psychoactive Substances (NPS) [NIJ Award #: 2020-DQ-BX-0007] Alex J. Krotulski<sup>\*,1</sup>, Sara E. Walton<sup>\*,1</sup>, Donna M. Papsun<sup>2</sup>, Melissa F. Fogarty<sup>1</sup>, Barry K. Logan<sup>1,2</sup> • <sup>1</sup>Center for Forensic Science Research and Education, <sup>2</sup>NMS Labs

### **Abstract / Overview**

Novel psychoactive substances (NPS) continue to increase in prevalence in the United States. Constant turnover of these drugs is a concern due to unknown effects and toxicity. Many laboratories may not have the resources to stay current with NPS trends which means a central authority is needed to provide assistance and guidance. To that end, and with NIJ funding, the Center for Forensic Science Research and Education (CFSRE) developed **NPS Discovery** – a drug early warning system – in 2018 to streamline the identification of emerging NPS and to disseminate important information to stakeholders.

The CFSRE's NPS Discovery program monitors NPS through sample-mining and data-mining analytical techniques. The sample populations that feed these workflows are facilitated through collaborations with medical examiner and coroner offices, crime laboratories, police departments, hospitals, and other public health and safety agencies, and include raw drug materials and toxicology specimens. Additionally, our program monitors online resources (e.g., gray market sites, drug use forums) for newly emerging NPS.



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## **New Drug Discoveries Since 2018**

Since 2018, NPS Discovery has reported **116** newly discovered NPS in the United States (Figure 1). **NPS opioids** remain the largest subclass (Figure 2). In 2021, NPS Discovery reported the discovery of **27** NPS for the first time.



Since 2018, NPS Discovery has identified **197** NPS in forensic samples (Figure 3). NPS opioids, stimulants, and cannabinoids represent the largest subclasses observed. In 2021, 97 total NPS were detected (Figure 4).









## ctsre NJ National Institute of Justice **NPS** DISCOVERY

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