



W05 Ohio's Assertive Approach to Scheduling Opioids and Fentanyl Analogs

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After attending this presentation, attendees will: (1) recognize the role of state government in the scheduling of drugs; (2) understand the importance of rapid scheduling of drugs for law enforcement purposes; (3) identify the parts of the molecular structure of drugs that are responsible for pharmacological interactions; and, (4) realize the importance of communication and cooperation between forensic laboratories and government entities.

This presentation will impact the forensic science community by providing an in-depth examination of how one state is combating the opioid epidemic.

Opioid overdoses in the United States have quadrupled since 1999. Among the 47,055 drug overdose deaths in the United States that occurred in 2014, 28,647 (60.9%) involved an opioid. Opioids were involved in 33,091 overdose deaths in the United States. in 2015.¹

Ohio was one of the five states with the highest rate of death due to drug overdose in 2015 (West Virginia: 41.5 per 100,000; New Hampshire: 34.3 per 100,000; Kentucky: 29.9 per 100,000; Ohio: 29.9 per 100,000; and Rhode Island: 28.2 per 100,000).¹ In response to the alarming trend in opioid deaths, government agencies in Ohio worked with forensic scientists across the state to combat this epidemic through rapid and novel legislation.

In 2016, confirmed cases of U-47700 opioid fatalities in Ohio initiated drug scheduling research to be conducted by the Ohio Attorney General's Bureau of Criminal Investigation (BCI). After BCI's research was provided to the State of Ohio Board of Pharmacy, the Board cast a swift and unanimous vote which classified U-47700 as a Schedule I opium derivative under rule 4729-11-02 of the Ohio Administrative Code.² The next day, Ohio Governor John Kasich signed an executive order authorizing the Board to take emergency action and subjecting U-47700 to criminal drug penalties as of May 4, 2016. This action occurred six months before the United States Drug Enforcement Administration placed U-47700 into Schedule I of the Controlled Substances Act on November 14, 2016.

Another combined effort in Ohio to combat the influx of newer drug analogs was the development of the "pharmacophore rule."³ The Office of the Ohio Attorney General working together with the Ohio State Board of Pharmacy developed this unique method of establishing guidelines for the scheduling of newer drug analogs based upon the scientific principles of drug design.

Drugs elicit their mechanism of action through biochemical and physiological interactions with drug targets. The pharmacophore of a drug molecule is the portion responsible for producing a pharmacological response and provides the core scaffold to which functional groups are added. Functional groups provide atoms for interacting with drug targets, such as receptors. The binding of a drug to a receptor produces most of the pharmacologic and toxicologic effects of the drug.

The "pharmacophore rule" addresses the fentanyl analog problem at the level of pharmacology before the compounds have even been identified in forensic laboratories. The rule is written such that a forensic scientist can identify the basic structural elements required for a fentanyl analog to bind to the drug receptor. If the binding elements are met as outlined in the Ohio Administrative Code, a forensic scientist can report the fentanyl analog as a Schedule I controlled substance.

The ability of government entities in Ohio to rapidly schedule newer opioids, in addition to the ability of forensic scientists in Ohio to utilize the "pharmacophore rule" to immediately classify new fentanyl analogs as Schedule I drugs, allows for rapid action on the part of law enforcement officials in the state.

Reference(s):

1. Rudd RA, Seth P, David F, Scholl L. Increases in Drug and Opioid-Involved Overdose Deaths – United States, 2010-2015. *MMWR Morb Mortal Wkly Rep* 2016;65:1445-1452.
2. Ohio Administrative Code, Chapter 4729-11-02, Schedule 1 Controlled Substances.
3. Worst TJ, Sprague JE. The "Pharmacophore Rule" and the Spices. *Forensic Toxicology* 2014.

Opioid, Pharmacophore, Drug Scheduling