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### B66 Identifying Emerging Drugs of Abuse

*Elizabeth A. Gardner, PhD\*, UAB Department of Justice, UBOB 210, 1530 3rd Avenue, S, Birmingham, AL 35294-4562*

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After attending this presentation, attendees will understand the process of identifying emerging drugs of abuse discovered through internet searches of drug forums and vendors of legal highs. This will include: (1) the misinformation offered by vendors of legal highs; (2) how to identify potential structural isomers and diastereomers; (3) using Nuclear Magnetic Resonance (NMR) to distinguish between isomers with similar mass spectra but different retention Gas Chromatographic (GC) retention times; and, (4) combo drugs.

This presentation will impact the forensic science community by raising awareness about identifying emerging drugs of abuse, identifying misinformation offered by the vendors, and discussing issues to be considered in developing a method for analytical analysis.

Legal highs are analogs of controlled substances that retain the psychoactive and addictive properties of the parent drug. The most recent influx of legal highs has been cannabimimetics and cathinones marketed as “Spice” and “bath salts,” respectively. They can be purchased in gas stations, head shops, or online, often by minors. As the components in the different “Spice” and “bath salts” products have been scheduled, new analogs have been introduced to take their place. Their manufacture is not regulated and best practices cannot be ensured. Because legal highs are not developed as potential pharmaceuticals, there is little or no clinical data available so emergency medical personnel have no guidelines for treatment in the case of overdose.

The focus will be on three new legal highs: (2-aminopropyl)-benzofuran (APB), methiopropamine (MPA), and 4-methyl pentedrone (4-MPD), each purchased from online vendors of research chemicals. There are four potential positional isomers of APB, 4-, 5-, 6-, and 7-APB. Both 5- and 6-APB are offered for purchase as legal highs. The isomers have distinct GC retention times that are confirmed by NMR. Analysis shows that both the 5- and 6-APB are being provided as claimed.

Methiopropamine is a thiophene analog of methamphetamine. It is often offered as part of a combo-drug, where two mildly psychoactive drugs are combined in an effort to mimic a controlled substance. Two samples of M&M were analyzed and contained MPA and 5,6-Methylenedioxy-2-Aminoindane (MDAI) as advertised. A sample of synthacaine, purported to be a mixture of MPA and dimethocaine, was actually a mixture of MPA and benzocaine.

Finally, the analysis of a product labeled 4-MPD is offered as an example of a legal high where the name and structure posted on the vendor’s web page did not match the drug. According to the name, it is pentedrone with a methyl group attached at the para position on the benzene ring. The structure that was posted on several vendor web pages was 2-(methylamino)-1-phenylbutan-1-one (buphedrone). When analyzed, the substance was actually 2-(ethylamino)-1-(4-methylphenyl)pentan-1-one (MEAP).

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#### **Legal High, Drug Analysis, Analog**