A186 Differentiation of Isomers of Synthetic Cannabinoids

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After attending this presentation, attendees will be familiar with the combination of analytical procedures that are necessary and sufficient to conclusively identify synthetic cannabinoids and preclude the possibility of false positives. This will be accomplished by outlining, for each of fourteen commonly encountered synthetic cannabinoids, the specific combinations of tests that can differentiate the particular cannabinoid from a series of its structural isomers.

This presentation will impact the forensic science community by describing a rational approach to the analysis and positive identification of an important and growing class of abused compounds.

The first herbal smoking blends laced with synthetic cannabinoids are believed to have been produced about six years ago. Sold in foil packets with a distinctive glinting eye logo, "Spice" was the forerunner of hundreds of similar products that have been sold in head shops and on the Internet under various names. In late 2008 and early 2009, JWH-018 and cannabicyclohexanol were identified as the active ingredients in Spice. Since then, a bewildering array of synthetic cannabinoids has been encountered by forensic laboratories. The purpose of this presentation is to introduce data and analytical schemes that will allow forensic laboratories to confidently identify many of these compounds.

In this two-part presentation, attendees will be introduced to the commonly encountered synthetic cannabinoids and will be presented with direct instrumental data comparisons of isomers of these compounds. All of the analyzed compounds were synthesized by Cayman Chemical Company.

Part one of the presentation will discuss the following compounds: the 3- and 4-methoxy isomers of JWH-250, the 3- and 4-chloro isomers of JWH-203, the 2- and 3-methoxy isomers of RCS-4, the 3- and 4-methoxy isomers of RCS-8, the 3- and 4-iodo isomers of AM-694, and the 2-naphthyl isomer of JWH-200.

Part two of the presentation will discuss the following compounds: fifteen structural isomers of JWH-018 formed by pentyl chain rearrangements and 1- and 2-naphthyl linkages, seven structural isomers of JWH-073 formed by pentyl chain rearrangements and 1- and 2-napthyl linkages, the six isomers of JWH-081 as determined by the six possible positions of the methoxy group on the naphthyl ring, the six isomers of JWH-122 as determined by the six possible positions of the methyl group on the naphthyl ring, the six isomers of JWH-210 as determined by the six possible positions of the ethyl group on the naphthyl ring, the six isomers of JWH-398 as determined by the six possible positions of the chloro group on the naphthyl ring, the 3- and 4-methyl isomers of JWH-251, and the 2-, 3-, and 4-fluoropentyl isomers of AM-2201.

The compounds listed were analyzed by GC/MS, GC/IRD, LC/UV/MS, and NMR. The chromatographic and spectral data revealed adequate separation and/or distinguishable spectral features among all the samples. The necessary and sufficient tests to discriminate between the parent compounds and their respective isomers will be discussed.

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Cannabinoids, Isomers, Spice

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