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ELISA Evaluation of K2-Spice Control Samples

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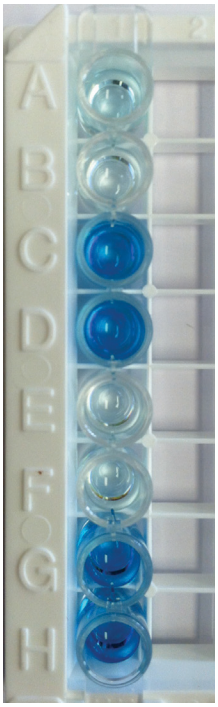
"K2-spice" is a term representing a new group of designer drugs that contain synthetic cannabinoids, which are incorporated into herbal products. These synthetic cannabinoids bind the same receptors as tetrahydrocannabinol (THC), the active ingredient in marijuana, but with greater affinity. Unfortunately, people that intentionally abuse K2-spice experience clinical signs that are more adverse than the side effects of marijuana use, which can include seizures, paranoia, hallucinations, or anxiety. Due to the highly variable concentrations of synthetic cannabinoids in manufactured herbal products, detection of K2-spice in biological specimens can be complicated. The hypotheses of this study was that a UTAK K2-spice urine specimen could serve as a quality control biological sample for K2-spice enzyme-linked immunosorbent assay (ELISA) testing, and that the UTAK K2-spice urine specimen would not produce as a positive result when tested against an ELISA specific for THC. Since the most common synthetic cannabinoid is JWH-018, this investigation evaluated the utility of a UTAK K2-spice urine specimen as a control for an ELISA specific for JWH-018. This urine specimen control was also analyzed using an ELISA for THC by itself. The optical densities of the UTAK K2-spice urine were compared to the positive and negative urine kit controls. When compared to the positive (O.D. 0.138) and negative urine (O.D. 1.311) kit samples, the UTAK K2-spice urine tested positive with an average O.D. of 0.119. When testing using the THC ELISA, the sample tested slightly positive, suggesting a potential for cross-reactivity. Preliminary data showed that urine containing THC did not cross-react with the JWH-018 ELISA. This study revealed that the UTAK K2-spice urine specimen would serve as a good quality control sample when using the ELISA specific for the synthetic cannabinoid JWH-018 to test urine samples. However, it was shown that a sample positive for K2-spice could potentially result in a false-positive THC ELISA result.

Research advisors Christina Wilson and Trevor Stamper write, "Suzette's preliminary study set the groundwork for establishing an appropriate quality control specimen and method validation for K2-spice testing in individuals. She was also able to show the potential for urine containing K2-spice to potentially result in a false-positive result with an ELISA kit specific for THC."



JWH-018 ELISA results. Wells A1 and B1: Positive urine kit specimen average O.D. 0.138. Wells C1 and D1: Negative urine kit specimen average O.D. 1.311. Wells E1 and F1: UTAK K2-spice urine specimen average O.D. 0.119. Wells G1 and H1: THC control urine specimen average O.D. 1.331.

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