ANALYSIS OF DESIGNER DRUGS AND THEIR METABOLITES IN BLOOD AND URINE SAMPLES

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Abstract

Synthetic cannabinoids (SCs) has hundreds of street names for instance "*Spice*", "*Spice Gold*", "*K2*", "*Black Mamba*", "*Feek Weed*," "*Genie*". SCs are group of designer drugs that mimic the natural cannabinoid effects. However, SCs have significantly higher binding affinities to the CB1 and CB2 cannabinoid receptors than the well-known Δ^9-tetrahydrocannabinol (THC) thanks to their special pharmacodynamic properties. In clinical and forensic practices only detecting the mother compound of SCs cannot provide reliable confirmation of their consumption due to their rapid metabolism. The aims of this study were in vitro (human liver microsome, immortalized human hepatocytes), in vivo (human urine and blood) and ex vivo (isolated rat liver perfusion) analysis of metabolites of the newest designer drugs in 2019. After optimizing the sample preparation (liquid-liquid extraction), new targeted LC-MS/MS method was developed for detecting the parent molecule and its phase I metabolites. Currently, the most commonly used SC is the 5F-MDMB-PICA. The importance of identifying metabolites can be well demonstrated by extracted ion chromatogram of positive urine sample (**Figure 1**), which shows that the ester hydrolysis metabolite of 5F-MDMB-PICA (363.2082 m/z, t_R: 1.86 min) has 150 times higher intensity than the parent molecule.

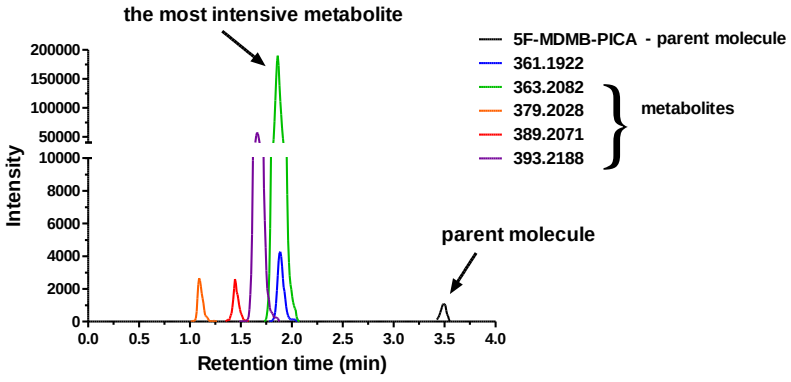

Figure 2. Positive urine sample

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