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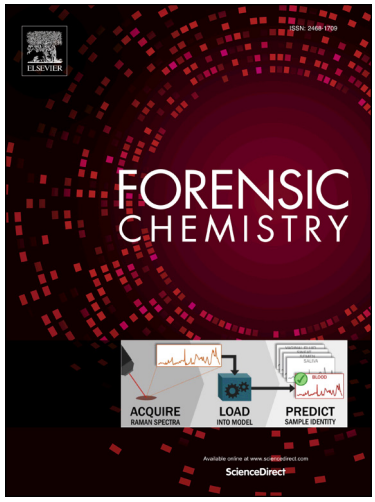

LC-MS/MS screening strategy for cannabinoids, opiates, amphetamines, cocaine, benzodiazepines and methadone in human serum, urine and post-mortem blood as an effective alternative to immunoassay based methods applied in forensic toxicology for preliminary examination

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Abstract

An LC-MS/MS based screening method for cannabinoids, opiates, amphetamines, cocaine, benzodiazepines and methadone was developed for the analysis of human serum, urine and post-mortem blood and discussed as an effective alternative to immunoassay based screening methods. Two mass spectrometric systems with differences in sensitivity common known were used for method validation. A simple protein precipitation was applied for a sample volume of 100 µL analysed using a Luna 5 µm C18 (2) 100 A, 150 mm × 2 mm analytical column and two mobile phases consisting of A (H_2O/methanol = 95/5, v/v) and B (H_2O/methanol = 3/97, v/v), both with 10 mM ammonium acetate and 0.1% acetic acid. The results achieved demonstrated that the method presented fulfils the recommendations for qualitative screening methods and can be applied successfully in the analysis of real samples.

Keywords: Screening; Immunoassay, LC-MS/MS; Blood; Urine; Serum

1. Introduction

Immunoassay based screening methods are applied widely for preliminary examination of forensic samples in Germany and other countries. For these purposes urine immunoassay methods have been adapted successfully for the analysis of human serum and whole blood [1-2]. As a consequence, they are an important part of screening strategies applied in many forensic laboratories among other methods based on high-performance liquid chromatography with diode array detection [3-4], gas chromatography-mass spectrometry (GC-MS) [4-5] or liquid chromatography-(tandem) mass spectrometry (LC-MS(/MS)) [4,6]. The popularity of