

Session Title On-Site Detection of THC and Related Drugs

Abstract Title **Innovative and Rapid Detection of Marihuana Consumption from Direct Breath Analysis**

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Date: Wednesday, March 09, 2016 - Morn

Time: 10:25 AM

Room: B316

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Abstract Text

In several clinical studies, the potential of ion mobility spectrometry coupled to rapid gas-chromatographic pre-separation (GC-IMS) for a comprehensive analysis of human breath was demonstrated in the past decade. Exploring the exhaled metabolic profile enables medical diagnosis and therapy control e.g. in nephrology or diabetes. Furthermore, the quantification of various remedies with sufficient correlation to plasma concentrations was shown e.g. for anaesthetics such as Propofol or Fluranes. Such methods could be applied for on-line anaesthesia control.

Encouraged from those findings, we developed a method for the on-site quantification of the consumption of Cannabis sativa, one of the most common illicit drugs world-wide with the objective to provide a tool for the regulatory authorities e.g. to control if the drivers vigilance is affected. A characteristic pattern of metabolites exclusively caused by Cannabis consumption was developed and quantified for the correlation with the THC plasma concentration which is at least the measure for the effects of the drug. The method was validated successfully with regard to false-positives e.g. caused by other hemp products and plant-based commodities. Presently, the method enables the on-site non-invasive detection of Marihuana consumption even after 3-4 hours which is in the range required by the authorities.

Keywords: Drugs, Forensics, Metabolomics, Metabonomics

Application Code: Safety

Methodology Code: Chemical Methods