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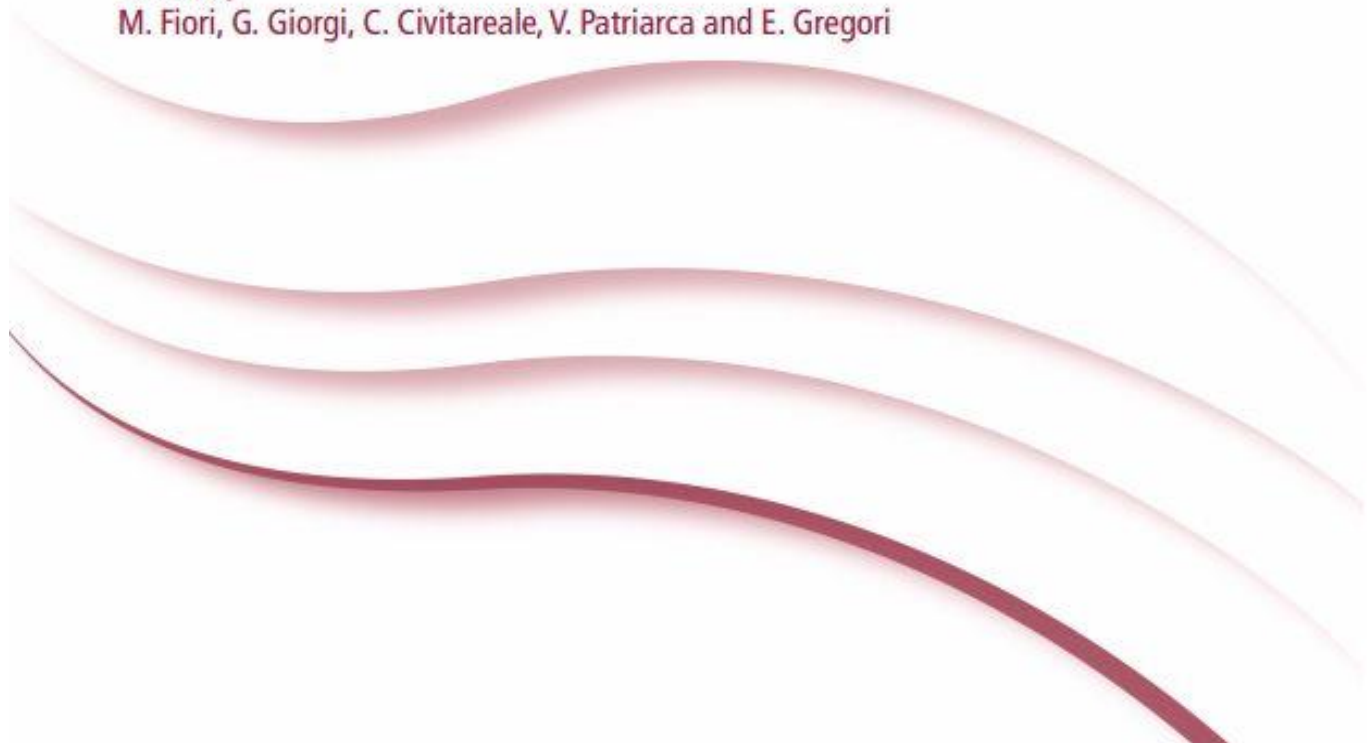
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ABSTRACT BOOK

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OR21. FORENSIC INVESTIGATION OF KERATIN MATRIX: DEVELOPMENT OF A METHOD BY TURBOFLOW™ HPLC-MS/MS FOR CANNABINOIDS QUANTITATIVE ANALYSIS

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The products of cannabis are the most frequently used illicit drugs of abuse detected in workplace drug-testing programs or in cases of driving under the influence of drugs. For this reason, there is a great need for sensitive and specific methods which can confirm the chronic exposure and which take account of the cut-off values that have been proposed in Italy by the GTFI Guidelines (Group of Italian Forensic Toxicologists). The method currently more appropriate for quantification of Δ^9 -Tetrahydrocannabinol (THC) and its major metabolite 11-nor-9-Carboxy- Δ^9 -THC (THCA) appears to be one that involves HPLC-MS/MS and keratin matrix. The purpose of this work, performed at the Mass Spectrometry Laboratory for Clinical Risk and Quality Control (CQRC) in A.O.U.P. "Paolo Giaccone" of Palermo, is the developing of an accurate method equally or more sensitive than those used routinely in forensic toxicology laboratories. A pre-analytical phase has seen the preparation of hair samples, comprising basic hydrolysis, and a subsequent Liquid-Liquid Extraction (LLE). In the analytical phase, the step of detection was performed using the Thermo Scientific™ Transcend™ II system which combines the online sample preparation technology TurboFlow™ with the chromatographic separation technique of High Performance Liquid Chromatography (HPLC) and the detection technique of tandem Mass Spectrometry (MS/MS) using a high sensitive Thermo Scientific™ TSQ Quantiva™ Triple Quadrupole Mass Spectrometer. During the phase of the developing method a series of experimental tests regarding the analytical conditions have been performed, on six different chromatographic columns. This has highlighted the main advantages of TurboFlow™, the adequate selectivity in the sample cleaning and the possibility of injecting more volumes of sample than the normal LC-MS techniques, leading to an appreciable increase in the sensitivity. According to the aim of the work, the latter steps of sample preparation, including LLE, were replaced with a simple hydrolyzate filtration and direct injection into TurboFlow™ system. In the light of the results we obtained it can be said that the method developed by TurboFlow™ -HPLC-MS/MS that involves the short phase of sample preparation procedure allows accurate quantification of cannabinoids in the keratin matrix. This technique, showing an adequate sensitivity, can be

compared and preferred to used routine techniques. The short phase of preparation of the sample, also, results in a considerable saving of time and materials and in the reduction of possible errors caused by the operator.