

**SCREENING OF NEW PSYCHOACTIVE SUBSTANCES IN URINE SAMPLES BY
HIGH RESOLUTION MASS SPECTROMETRY**

**Noelia Salgueiro-Gonzalez^{1,2}; Sara Castiglioni¹; Emma Gracia-Lor^{1,3}; Nikolaos I. Rousis¹;
Lubertus Bijlsma³; Alberto Celma³; Felix Hernandez³; Ettore Zuccato¹**

¹ IRCCS – Istituto di Ricerche Farmacologiche “Mario Negri”, Department of Environmental Health Science,
Via La Masa 19, I-20156 Milan, Italy

² Grupo Química Analítica Aplicada (QANAP), Instituto Universitario de Medio Ambiente (IUMA),
Centro de Investigaciones Científicas Avanzadas (CICA). Departamento de Química Analítica, Facultad de
de Ciencias, Universidade da Coruña, Campus de A Coruña, E-15071 A Coruña, Spain.

³ Research Institute for Pesticides and Water, Universitat Jaume I, Castellon, Spain

E-mail contact: noelia.salgueiro@marionegri.it

In the last decade, the widespread use of new psychoactive substances (NPS) raised global concern due to the high number of different substances not regulated available on the market and their high potential toxicity for human health. These substances are synthesized adding or changing a functional group of an already controlled drug molecule, so they have similar psychoactive properties of traditional drugs of abuse [1]. To obtain reliable information about the consumption of NPS the main tools are epidemiological surveys and the analysis of biological samples, mainly urine. However, the continuous synthesis and marketing of new NPS make the identification of these substances an analytical challenge.

The aim of this work was to screen the presence of selected NPS in urine samples collected during music festivals in Europe and evaluate their consumption. A list of 190 NPS was created according to the frequency of detection reported by the European Early Warning System [2], and included synthetic cannabinoids and cathinones, phenethylamines, synthetic opioids, tryptamines, piperidines, aminorex derivatives, natural NPS, benzodiazepines and ketamine analogues. The qualitative analysis of NPS was carried out using high-resolution mass spectrometry (HRMS, Q-Orbitrap analyzer). A first screening was performed followed by a nontarget analysis based on data-independent acquisition mode. The proposed target NPS were confirmed by the measurement of the corresponding standard when available.

Among the substances investigated, only the synthetic cathinone 4-chloro-alpha-pyrrolidinopropiophenone (4-Cl- α -PPP) was identified and confirmed in the analyzed samples by acquiring the corresponding analytical standard. As far as we know, this is the first time this synthetic cathinone was identified in urine sample from music festivals.

Acknowledgements: This work was supported by the project NPS- Euronet (HOME/2014/JDRU/AG/DRUG/7086). N. Salgueiro thanks Xunta de Galicia-GAIN for her postdoctoral grant (Modalidade A, 2016).

References:

- [1] [1] J. Kinyua, N. Negreira, B. Miserez, A. Causanilles, E. Emke, L. Gremeaux, P. De Voogt, J. Ramsey, A. Covaci, A. Van Nuijs. *Sci Total Environ* 573 (2016) 1527-1535.
- [2] [2] European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), Europol. 2014 annual report on the implementation of Council Decision 2005/387/JHA. Implementation reports. Luxembourg: Publications Office of the European Union; 2015