



DIPARTIMENTO DI FARMACIA E BIOTECNOLOGIE

## Life & Chemical Sciences Seminars

# Methodological and technological advances in bioanalysis and separation science

**Prof. Laura Mercolini**

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**Venerdì 2 febbraio ore 14:30** – Aula 1, Via Belmeloro 6

### **Abstract**

Current research priorities in bioanalysis of illicit substances subjected to regulation and control by governmental and supranational agencies, such as drugs of abuse and compounds prohibited in sports, involve many methodological approaches. These include the improvement of existing analytical methods for detecting specific drugs, the development of analytical strategies for molecules not yet reliably detectable and the design of effective protocols for testing widely abused substances across a wide range of scenarios. These areas of investigation and research carried out by Pharmaco-Toxicological Analysis Laboratory Group (PTA Lab) will be outlined and explored. A summary will be given on recently developed methods for the analysis of several drugs of abuse and compounds included in the list of substances banned by World Anti-Doping Agency (WADA) in miniaturised biological matrices. Extensive bridging studies have been carried out to compare innovative samples with classic specimens, for the advanced analysis of both commonly prohibited compounds and new psychoactive substances (NPS) used for doping purposes. Moreover, a recently funded research project, currently in progress in collaboration with WADA, will be illustrated. This includes promising preliminary results from novel strategies to collect dried microsamples, processed by means of streamlined workflows, for fully automated LC-MS/MS analysis of several peptide hormones. Finally, the most recent results will be presented regarding the design and implementation of original approaches of automated high-throughput sample pre-treatment, using flow techniques, microfluidic chip technologies and on-line sample processing for bioanalytical applications and separation science purposes.

### **Biosketch**

Laura Mercolini is Assistant Professor in Medicinal Chemistry and Head of Pharmaco-Toxicological Analysis Laboratory Group (PTA Lab) at FaBiT Department, University of Bologna. She has a Master's degree in Medicinal Chemistry and Technologies and a Ph.D. in Chemistry. Dr. Mercolini carries out her research projects also abroad, periodically visiting University of California, Irvine (UCI, CA, USA), VA Medical Center in Long Beach (CA, USA), University of Geneva (Switzerland), Charles University (Czech Republic) and University of Lincoln (UK). Her studies are devoted to the development of innovative strategies for the analysis of doping agents, drugs of abuse and CNS drugs in biological and non-biological samples, combining cutting-edge HPLC and CE methodologies with miniaturised sampling and pre-treatment approaches. She is author of 67 scientific papers in high-ranked journals and inventor of a national patent. She has delivered more than 150 talks and seminars at international congresses and prestigious institutions abroad, including plenary and keynote lectures. Dr. Mercolini is member of the Editorial Board of Journal of Pharmaceutical and Biomedical Analysis and of the evaluation panel of EU fundamental and strategic research projects. She is Principal Investigator of national and international funded research projects, mainly in collaboration with World Anti-Doping Agency (WADA), United Nations Office on Drugs and Crime (UNODC), Italian Ministry of Health and Erasmus+ European Strategic Partnership.