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*Abstract*

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### **“Mass spectrometry in pharmacology and toxicology: routine, specialized and research applications”**

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Very few new immunoassays have been marketed in the last ten years for therapeutic drugs, drugs of abuse or toxicants. Pharmaco-toxicologists have thus turned towards separative techniques, mostly coupled to mass spectrometry. Owing to its sensitivity and large range, LC-MS in particular has been tremendously successful, with innumerable applications for drug screening (detection) or determination (quantitation). For instance, we developed and use in routine a general unknown screening of xenobiotics with HPLC coupled to a hybrid triple quadrupole – linear ion trap mass spectrometer, now proposed by the instrument vendor.

Initially, one of the limitations of LC-MS in clinical laboratories was its absence of automation and the low number of results each instrument could produce daily. Different solutions now exist, including one-step protein precipitation / sample purification, or on-line sample preparation using 2D LC, as well as different “high-throughput” chromatographic techniques, all of which are actually applied in clinical pharmacology and toxicology.

Finally, LC-MS is also an important technique for biomarker research, for the analysis of peptides, proteins, lipids or metabolites (small endogenous molecules). In the European program BIOMARGIN (FP7 2012), different systems are used to cover all these –omics, in order to detect, select and validate predictive biomarkers of graft injuries in renal transplant patients.

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