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### APPLICATIONS OF ICP-MS HYPHENATED TO HPLC ON BIOLOGICAL SAMPLES FOR PK STUDIES

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ICP-MS is a well-established analytical technique mainly applied to metal determinations both in inorganic chemistry and biological samples (environmental and toxicological studies). The possibility of ICP-MS hyphenation to separation techniques, like HPLC and CZE, has shown interesting results in particular for the speciation of inorganic ions while applications in biological samples for pharmacological studies are rare. Along the years several pharmaceutical products containing metal, like iron, in high molecular weight complexes have been developed presenting difficult analytical problems especially in biological samples; indeed the determination of the metal itself is of modest values without concomitant information like molecular weight and polarity. In this context the combination with HPLC, permitting separations based on molecular weight, ionic strength and hydrophobicity, is an ideal tool to develop selective methods for such complex compounds. The possibility to correctly quantitate an element, irrespective of the chemical structure where is contained, is another interesting feature of ICP-MS and it offers interesting possibilities of metabolites quantitation and identification in biological samples of drugs containing not just metals but also sulfur and/or phosphor. A series of applications centered on these two classes of compounds will be presented showing the great potential of ICP-MS as a detector in combination with HPLC; as always nothing is perfect and therefore the limitations of this analytical approach will be discussed, in particular matrix effects and mobile phase compatibility.

### BIOGRAPHY

Silvestro L graduated in Medicine in Turin (Italy) in 1984 and specialized in Pharmacology in 1988. From 1989 he is applying HPLC-MS in quantitation of bioanalytical samples as well as identification of drug metabolites. In 1990 he began to study the application of ICP-MS and other elemental analysis methods, hyphenated to HPLC, on bioanalytical samples. In 1996 he has co-founded 3S-Pharmacological Consultation & Research GmbH, a consultation company and CRO, in Germany and is still actively involved in the development of innovative analytical methods. From 1998 the company has expanded the activity in East Europe (Romania, Moldavia) creating an analytical laboratory in Romania (Bucharest). In his scientific activity he has contributed to more than 60 articles in international scientific journals.

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