
UHPLC-MS: A POWERFUL TOOL IN DRUG ANALYSIS

J-L. Veuthey, S. Rudaz and D. Guillarme

School of Pharmaceutical Sciences, University of Geneva, University of Lausanne, 1211
Geneva 4, Switzerland, jean-luc.veuthey@unige.ch

In the last ten years, a strong development has emerged in Liquid Chromatography (LC) in terms of chromatographic supports and instrumentations to achieve fast, ultra-fast and highly efficient separations. Various analytical strategies have been reported for this purpose, such as the use of monolithic supports, high temperature, fused-core particles and sub-2 μ m particles working under very high pressure (UHPLC). Among the proposed approaches, it was demonstrated that UHPLC presented several advantages.

In the same period of time, Mass Spectrometry (MS) with different analyzers became the best complementary tool to LC, to further gain selectivity and/or sensitivity, when dealing with complex matrices (i.e. biological fluids or natural products extracts).

The purpose of this work is to demonstrate that UHPLC-MS is a powerful analytical approach through different applications.

First, UHPLC-TOF-MS can be used to generate very high resolution for the metabolite profiling of complex samples such as plant extracts. A strong emphasis was made on the possibilities offered by UHPLC at high temperature (i.e. HT-UHPLC) to further enhance chromatographic performance.

Second, a UHPLC-QTOF-MS system was evaluated in anti-doping control for the fast determination of about 200 doping agents in urine. The method was validated and used routinely for rapid screening and selective confirmatory analyses.

Third, it is finally worth mentioning that UHPLC-MS/MS and UHPLC-TOF-MS can be attractive in ADME studies at an early stage of the drug discovery process (e.g. fast lipophilicity determination and separation of various substrates and metabolites for the study of metabolite stability, drug-drug interaction, etc).