UPLC coupled to high resolution mass spectrometry: A tool for multiresidue veterinary drug methods

Anton Kaufmann

Official Food Control Authority of the Canton of Zurich
(Kantonales Labor Zürich)
Switzerland

Analysis of veterinary drug residues has moved away from monitoring a particular compound, or compounds belonging to a single drug group, to cover a much wider range of pharmaceutically and chemically different drug groups. This has challenged the previous existing analytical methodologies.
Extraction methods had to be optimized to produce good recoveries for the chemically different analytes. The resolution of the chromatographic system has been improved by using Ultra Performance Liquid Chromatography (UPLC). Mass spectrometric detection had to be capable in monitoring the increasing number of analytes at a wide range of concentrations. The availability of affordable (Time Of Flight or Orbitrap) and sufficient fast high resolution mass spectrometers (HRMS) permitted the monitoring of full scan data. HRMS together with narrow mass windows produces a selectivity which approach MS-MS transition traces. HRMS data have the invaluable advantage, that they are stored as full scan spectra. Hence any exact mass of interest (analyte) can be extracted from the raw data. This permits a-posteriori data mining techniques. Traditional tandem quadrupole mass spectrometry files contain only the predefined analyte specific mass traces and offer therefore much less flexibility. The availability of HRMS data permits also the monitoring of active compounds or metabolites for which there are no commercially available reference substances. Furthermore drug group specific detection is available for some drug families by monitoring generic mass fragments. Hence HRMS based methods are well suited for "food scandal ready" multiresidue methods which must have the capability of easily integrating new additional compounds.