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Challenges in 2D-LC-multiple-heart-cutting-MS food analysis

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Today's consumers demand foods and beverages that are safe, quality, and nutritious. Food analysis is of great importance when it comes to ensuring the quality of modern food demands. Multiple-heart cutting (MHC) 2D-LC-MS/MS is an alternative technique overcoming disadvantages of 1D-LC analysis, by not resolving isomers and similar substances of phytochemicals, vitamins, and amino acids. Even though the potential of MHC-2D-LC enhances significantly separation performances and analytes identification strategies, several details are to consider, achieving reliable results. MS analysis after non-volatile buffers or reagents in the first LC-dimension is not a straightforward procedure, mostly due to the incompatibility of common buffers used in LC-UV analysis, with the electrospray ionization process. Analytical column setup in the first and second LC-dimension, buffer removal strategies and method development are of crucial importance when it comes to LC-MS/MS detection in the third analytical dimension. Mass spectrometry detection is a powerful tool to gain structural information, resolving co-eluting analytes, but isomers cannot resolve even by using HRMS instruments. Therefore, a second chromatographic dimension gives the possibility to separate and detect those phytochemical or amino acid isomers in one analytical run. This approach allows a fast and reliable gain of information about the ingredients in foods and beverages.

Biography

Bernhard Wager has her expertise in the field of analytical chemistry in the field of pharmaceuticals, food additives and food analysis. He has developed several analytical methods in the analytical field of LC-MS/MS to support food analysis and clinical studies in biological matrices studying the impact of administer food and food additives. His experience in research, teaching has focused at the FH JOANNEUM – University of Applied Sciences, Graz, Austria.

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