

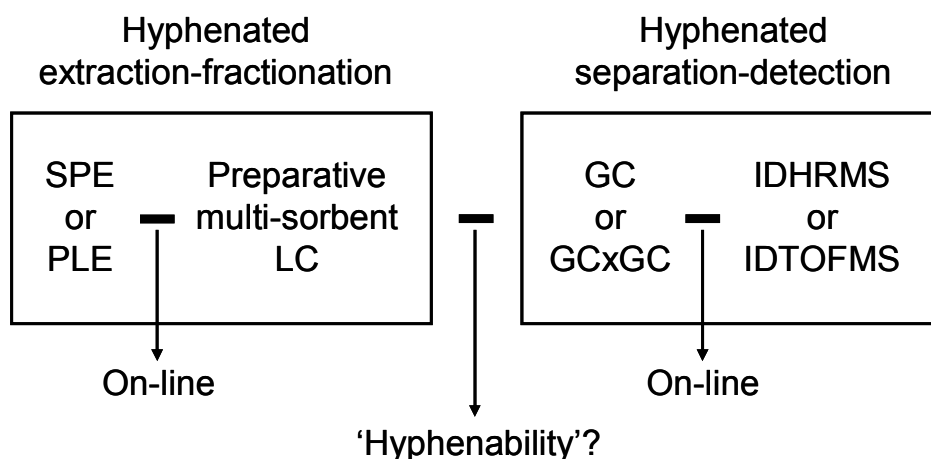
## Emerging Hyphenated and Comprehensive Multi-Dimensional Techniques for the Measurement of POPs in Food.

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Hyphenated techniques can be defined as the on-line coupling between a separation technique and a spectroscopic detection technique. When interfaces are well selected, this adds an additional (independent) dimension to the data obtained. Separation techniques themselves can also undergo hyphenation. The comprehensiveness of a multi-dimensional separation can be achieved when the entire sample is subjected to the whole separation process under orthogonality and conservation rules [1]. The multiplex sign is then used instead of the hyphen sign, the later only indicating that the systems are coupled on-line. The efficiency of the symbiotic relation between the techniques depends upon the degree of orthogonality, or the degree of independence of the retention mechanisms in the two (or more) dimensions, but also on the sample dimensionality itself [2].

Because a rather selective bio-accumulation of POPs occurs in biological samples, their analysis is usually less demanding in terms of separation power than for environmental samples that can virtually contain all compounds. Nevertheless, the measurement of POPs in biological samples is challenging and concern dozens of analytes. Hyphenated and comprehensive multi-dimensional techniques find here a stimulating area of application.



We report here on the latest developments in the coupling and hyphenation of sample preparation techniques as well as separation and detection techniques for the measurement of selected POPs in foodstuffs of animal origin.

### References:

1. Giddings, J.C. Two-Dimensional Separations, Concept and Promise. *Anal. Chem.* **1984**, *56*, 1258A-1270A.
2. Giddings, J.C. Sample Dimensionality: A Predictor of Order-Disorder in Component Peak Distribution in Multi-Dimensional Separation. *J. Chromatogr. A* **1995**, *703*, 3-15.