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Application of liquid chromatography-mass spectrometry in the analysis of phytochemicals

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Phytochemicals are non-nutritive compounds found in plant foods such as fruits, vegetables, cereals and etc. They have received attention in human nutrition due to their health beneficial effects, mainly as antioxidants. Particular class of phytochemicals, lignans have gained further interest due to their promising role in the prevention of lifestyle diseases. However, it is essential for epidemiological studies to have more evidence to be able to link the intake of lignans to this promising role. In this context, it is necessary to study large population groups to obtain sufficient statistical power. The aim of this study was to develop quantitative LC-MS/MS methods for high throughput of samples with high sensitivity, meeting the needs of analytical laboratories. The quantification of bio-fluids was performed on micro LC coupled to QTrap 5500 Mass Spectrometer. In the first method, we have quantified two enterolignans, enterolactone and enterodiols, and eight plant lignans. In the second method, we have quantified enterolactone in its intact forms as glucuronide and sulfate. Both methods contain only one extraction step using solid phase extraction, good chromatographic separation on the reverse-phase columns and short chromatographic runs. The importance of these new methods is two-fold. Firstly, since the methods are rapid and easy to perform they can be used for high throughput of samples and therefore will be the methods of choice for future epidemiological investigations and clinical diagnosis. Secondly, we hope that measuring enterolactone in its intact forms will contribute with new knowledge on the role of enterolactone in human health.

Biography

Natalja P Nørskov has completed her PhD at Aarhus University, Denmark. After her PhD, she continued her work as a Post-doc at Aarhus University working on development of high throughput methods for quantitative metabolomics using LC-MS instruments. Many of the methods are now published in the international journals. She is also a Leader of a PhD course titled, "Hands-on targeted and untargeted LC-MS metabolomics with emphasis on measuring phytochemicals in plasma and urine".

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