UNIVERSAL DERIVATIZATION REAGENTS IN LC-MS

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Amino acids (AAs) are well-known compounds which are widely distributed in natural products and biological samples. In truth, 9 out of 22 are essential (indispensable) amino acids which are not synthesized in human body [1]. Besides, they serve as protein building blocks, metabolic intermediates, and substrates for energy production.

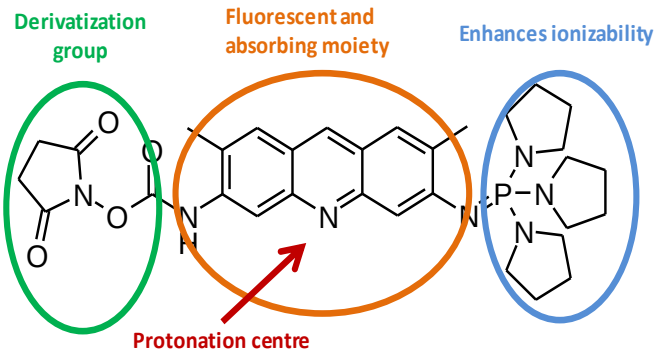

Fig 1. Example of derivatization reagent.

The last two decades have seen a growing analytical trend towards derivatization reagents to improve sensitivity and chromatographic separation, enhancing ionization efficiency as well as giving more information through fragmentation in mass spectrometry (MS) [2].

The purpose of this investigation is to employ high performance liquid chromatography (HPLC) coupled with different detectors such as tandem MS/MS compatible with electrospray ionization (ESI) and ultraviolet-visible (UV-VIS) or fluorescence detector (FLD).

Numerous derivatization reagents exist, but most of them are designed for a specific detector. The suggested workflow includes preliminary synthesize in-house different succinimidyl ester and carbamates which could be used as derivatization reagents for amino acids. Their use is explored in applications to understand the relationship between different spectrometers.

Firstly, LC-UV or LC-Fl is employed to observe the amino acid present in the samples. The strong point of these detectors is no matrix effect. Thereafter, an optimal sample pre-treatment and preparation will be designed and the analysis will be carried out with MS detector to archive better detection and quantification limits.

Reference:

[1] Protein and Amino Acid Requirements in Human Nutrition, Geneva, 2007.

[2] M.-L. Oldekop, R. Rebane, K. Herodes, European Journal of Mass Spectrometry 23 (2017) 245–253.

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