

## Development of Innovative Bitterness Caseic Hydrolysates by Combining Biocatalysis/Proteomics Approaches

Dahlia Daher

Avenue Fernand Lobbedez, France

Enzymatic hydrolysis of proteins is used in the food industry to improve their techno-functional properties such as solubility, emulsification or to prepare extensively hydrolyzed proteins for nutritional properties (sports-, infant-, diet-nutritions...). Protein hydrolysate properties are determined by the structure of peptides produced. These depend on **i**) the nature of native proteins hydrolysed, **ii**) the specificity of the enzyme or enzymes cocktails and on **iii**) the hydrolysis conditions (pH, temperature, hydrolysis time).

One of the main problems of protein hydrolysis is that it affects the flavour and taste (especially bitterness of the hydrolysates). The aim of our project is to highlight the link between analyses characterizing the hydrolysates in terms of peptide composition (mainly mass spectrometry data) and sensory analysis of these hydrolysates.

-Sixteen hydrolysates of milk caseins (varying in terms of bitterness) were carried out for this study. Sensory

characterization of hydrolysates was done using a trained panel (15 people trained for 9 months to quantify bitterness and off flavours) while analytical characterization was made by peptidomic approach using RP-UPLC-ESI-qTOF-MS/MS device.

Firstly, the first dimension of PCA on the mass spectrometry data is uncorrelated with the descriptors acid, bitter, acid persistence and bitterness persistence and correlated with sweet, milk and milk persistence. Secondly, the analysis of variance (ANOVA) of sensory data combined with the multiple comparison test (Duncan) allowed to highlight a group of 4 products significantly less bitter ( $p < 0.05$ ) than the other. This study demonstrates that the proteomic approach is promising for revealing the sensory characteristics of protein hydrolysates.