



Research group SPECTRE « Spectroscopies, électrochimie et réactivité » offers a position, starting 1st october 2023 for:

Doctoral research project:

Mass spectrometry based analytical method development for cyclic bioactive peptides.

under the supervision of : Assoc.Pr. HDR A.Memboeuf and Assoc.Pr. A.Maroto.

Peptides are biomolecules present in tissues and cells of living organisms. They take part in various crucial biological processes affecting immune system as well as nervous, cardiovascular, neuronal or digestive systems. They are composed of amino-acids (aa.) arranged in a precise order (the peptide sequence) that strongly affects their interactions with biological targets through enhanced selectivity and affinity towards the targets. Bioactive peptides are now accessible to conventional synthetic procedures enabling the possibility for biomimetic strategies to be developed in order to better tune their structures for a variety of applications.

Bioactive peptides are used as additives in agro-chemistry (e.g. as antioxydant or against microbial degradation). For the last two decades, they have been used in novel therapeutic strategies. They show high therapeutic performances, with 60 peptides actually available on the pharmaceutical market, in particular for the treatment of diabetes or hormone-sensitive cancer (e.g. prostate or breast cancers). Two thirds of those therapeutic peptides actually have a cyclic structure (e.g. antibiotics). Moreover, the correct isolation and identification of natural peptides with such cyclic structures together with the synthesis of analogues helped in improving further their pharmaco-kinetic properties, their stability and their chemical/biological activity.

The precise determination of the molecular structures of cyclic peptides is of paramount importance to rationalize their role, optimize their actions in biologic media and assess their biological or synthetic production. This essentially involves the determination of the number of amino-acids, their nature and position in the peptide, . The research project is devoted to the development of specific mass spectrometry analytical techniques to achieve these goals. To this end, original tandem mass spectrometry techniques developed in our lab, coupled with liquid chromatography and ion mobility separation techniques will be used. Chemometric tools together with method validation procedures will help assess the results.