Université Claude Bernard Lyon 1

MASTER de PHYSIQUE

Proposition de sujet de stage
Année 2017-2018

Parcours Optique, Physique Atomique et Moléculaire

Nom du Laboratoire : Institut Lumière Matière
Groupe : Spectrométries des Biomolécules et Agrégats
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Intitulé du stage :

Pump-probe experiments to assess molecular conformational dynamics

Résumé du travail demandé :

Pump-probe experiments are the future to understand and engineer the function of proteins. It allows to follow and control charge transfer reactions as well as molecular conformational changes. Recently we have performed optical pump-probe experiments on mass-selected ions trapped in the gas-phase in a mass spectrometer, and determined the kinetics of coupled electron and proton transfer in a small molecule. The results illustrate the interdependence of conformation and proton transfer dynamics in a small peptide. It triggers immediately a set of fundamental physical questions on factors limiting the charge and conformation dynamics. The aim of this training will be to characterize the correlation between constrained molecular dynamics and proton transfer rate in model peptides.

The proton transfer dynamics following the radical peptide formation will be studied as a function of different conformational constraint parameters: (i) the distance between reactive sites (peptides length), (ii) the constrained flexibility, (iii) the steric hindrance.

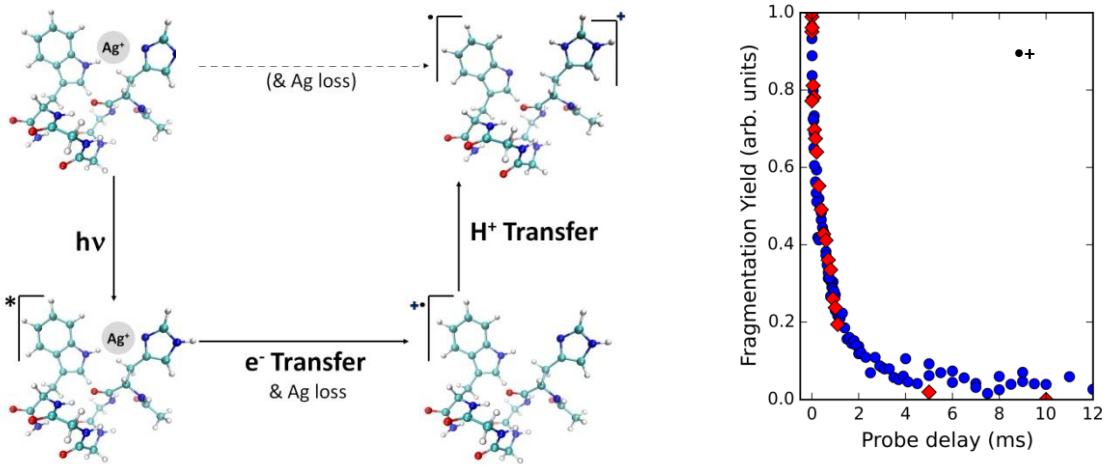

Figure - How to use the optical signature of tryptophan radical cation to probe the proton transfer rate and thus the conformation dynamics of peptides by pump-probe UV-Vis spectroscopy

Indication éventuelle d'ouverture vers un sujet de thèse : Oui. **Type de financement envisagé :** Bourse ministère.