

Master Frontiers in Chemistry**2019-2020****Proposition de stage de Master**au niveau M1 et/ou M2 **TITRE DU STAGE : SURFACE FUNCTIONALISATION OF PLASMONIC NANOPARTICLES AS DUAL-MODAL PROBE FOR CELL IMAGING.**

SUJET DU STAGE (10-15 LIGNES) :

The combination of surface enhanced Raman spectroscopy (SERS) and metal-enhanced fluorescence (MEF) onto single plasmonic nanoparticles (NPs) is very promising for boosting up the accuracy and sensitivity in spectroscopic diagnosis and analysis of tumor tissue. SERS is an ultrasensitive technique to detect analyte, measuring the difference between the energy of the incident photons and scattered photons, when the target molecule is absorbed on or close to plasmonic nanoparticles surface (distance < 10 nm). The MEF effect is based on increased excitation or/and emission rate of fluorophore, induced by interaction between the molecule's dipole moment and surface plasmon field of NPs when their distance is maintained at 5-90 nm. Despite both phenomena arise on plasmonic platform (e.g. Au), it is a great challenge to tailor the optimal distance to Raman reporter and to fluorescence label on the single NPs surface. To meet this challenge, we propose to use an innovative and original surface technique to functionalize AuNPs surface with different aryl-diazonium salts. The purpose of our project is to graft multilayers where the first serves as Raman tag for SERS and the second as adsorption site of fluorophore for MEF. Then the developed dual-modal nanoprobe will be applied for a proof-of-concept in epithelial cell imaging.

DATES ET DUREE DU STAGE : FEVRIER-JUILLET (5-6 MOIS)

CONTACT - RESPONSABLE(S) DE STAGE

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