

Spécialité de Master « Optique, Matière, Plasmas »

Stage de recherche (4 mois minimum, à partir de début mars 2012)

Proposition de stage pour l'année 2011-2012 (ne pas dépasser 1 page)

Date de la proposition :

Responsable du stage / internship supervisor:			
Nom / name:	WESTBROOK	Prénom/ first name :	Nathalie
Tél :	01 64 53 33 41	Fax :	
Courriel / mail:	nathalie.westbrook@institutoptique.fr		
Nom du Laboratoire / laboratory name: Laboratoire Charles Fabry			
Code d'identification :	Organisme : Institut d'Optique		
Site Internet / web site: www.institutoptique.fr/lcf/Groupes-de-recherche/Biophotonique/			
Adresse / address: 2 avenue Fresnel 91127 Palaiseau Cedex			
Lieu du stage / internship place: Institut d'Optique, Palaiseau			

Titre du stage / internship title: Optical tweezer study of a secondary structure on RNA, involved in the synthesis of selenoproteins.

Résumé / summary

The "SECIS" sequence, present on certain messenger RNAs, is involved in a complicated process allowing the ribosome to incorporate a selenocystein inside a protein, in place of a stop codon which usually signals the end of the translation. This sequence forms a secondary structure, which must have a rigidity that evolves as a function of proteic factors, in order to allow first the incorporation of selenocystein, then the further translation of following codons. Optical tweezers, which allow us to apply a well controlled force on a bead attached at one end of the RNA, thanks to a tightly focused laser beam, is an ideal tool to study the variation of the rigidity of this secondary structure. The difficulty here resides in the short extension corresponding to the unfolding of the SECIS structure. We have thus started experimenting with longer structures, and we observed our first unfolding signal in July 2011.

During the master internship, those measurements will be reproduced, and first attempts on SECIS will be carried out. The student will also set up an additional laser for detection purposes, superimposed over the trap laser, which will allow us to measure independently the position of the trapped bead, a condition necessary if we want to use a dual trap arrangement.

This internship can be pursued as a PhD, in collaboration with our biologist collaborators at the Center for Molecular Genetics (Centre de Génétique Moléculaire) at CNRS in Gif/Yvette.

Toutes les rubriques ci-dessous doivent obligatoirement être remplies

Ce stage pourra-t-il se prolonger en thèse ? Possibility of a PhD ? : YES			
Si oui, financement de thèse envisagé/ financial support for the PhD: Ecole Doctorale Ondes et Matière (EDOM) ou Région Ile de France via le Centre de Compétences en Nanosciences d'Ile de France (Cnano)			
Lasers et matière	x	Lumière, Matière : Mesures Extrêmes	x
Optique de la science à la technologie	x	Plasmas : de l'espace au laboratoire	

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