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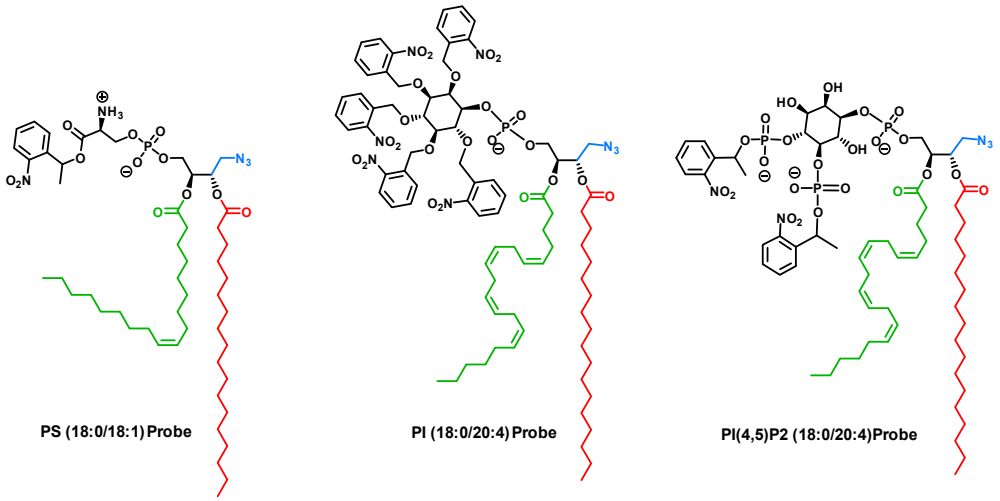
UMR 6014 CNRS COBRA

Equipe de chimie bioorganique

PhD fellowship :

A toolbox to decipher glycerophospholipids (phosphatidylserine and phosphatidylinositol) roles *in cellulo*.

Lipids are biomolecules having a large variety of role including structural function as membrane components, but are involved in cell metabolism or as signaling molecules. More than 40.000 different lipid molecular species have been identified to date, but the function of most them remains elusive. This is especially the case for phospholipid classes that exist in different forms depending on their fatty acyl composition. Our team recently solved the bottleneck for in cellulo clickable synthesis for phosphatidic acid (PA) species (unpublished results). This new project named PIPS aims to extend this methodology to much more challenging glycerophospholipids such as phosphatidylserine (PS) and phosphatidylinositol phosphate (PI/PIP). We will synthetize modified PS and PIP based on our synthetic pathway set up for the different PA. As for the PA we will focus on caging the head-group to prevent interaction with specific proteins as well as undesired enzymatic transformation of the PS and the selected PI/PIP, and on the addition of a small clickable moiety on the glycerol core leaving the fatty acids untouched since we specifically want to determine the function of the different forms of PS and PIP, thus maintaining the fatty acids chains unmodified is of pivotal importance. This synthesis relies on three main aspects: 1) the possibility to target a specific PS/PI/PIP species bearing various fatty acid chains; 2) protection of the phosphate or serine head group with one or more photolabile moieties; 3) introduction of a versatile grafting function for further modification (fluorophore, photocrosslinker) both *in vitro* and *in cellulo*.



This project will be support by our two biologist Partners : Pr. Maité Montéro of the Université de Rouen and the Dr. Nicolas Vitale of the Université de Strasbourg. Most of the thesis works will be done in the bioorganic chemistry team under the supervision of the Pr. Pierre-Yves Renard and the co-supervision of the Dr. Sébastien Balieu in the COBRA laboratory of the LABEX Synorg at the Université de Rouen.

To apply :

- CV and a cover letter
- Supporting letters.

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