



PhD Position (2025-2028):

– Laboratory CARMen (Ex COBRA), UMR 6064, CNRS, University of Rouen Normandy –

Photocatalytic assembly of ligands for drug discovery

Key words: Drug discovery, Photocatalysis, Organic chemistry, Bioconjugation, Target-guided synthesis.

Funding: Region/FEDER

Expected starting date: October 1st, 2025

Gross salary: 2250 €

Project overview: Kinetic target-guided synthesis (KTGS) is a fragment-based drug discovery (FBDD) approach in which the protein of interest is able to both select good binders and promote their linking through irreversible bond formation, in a single-step process.¹ In situ click chemistry, pioneered by Sharpless and colleagues, is the most used KTGS reaction for the identification of multisite ligands. However, this strategy requires significant entropic contributions to overcome high activation barriers, which can result in a long incubation time (up to several days), when tolerated by proteins, to counterbalance its low reactivity.² Based on this observation, we investigated the use of a photochemical transformation as a complementary ligation approach, to accelerate KTGS reactions to an unprecedented level (Photo-KTGS).³ This research program aims to combine photocatalysis with KTGS for the first time, to develop new reactions without background activity.

Candidate profile: We are looking for highly motivated candidates with a strong interest in working at the interface of organic chemistry and biology. This multidisciplinary project will involve organic synthesis, bioconjugation, LC-MS/MS analyses and enzymatic assays. Experience in bioconjugation or protein purification would be a plus.

Application procedure: A detailed curriculum vitae, a short research summary, and two contacts able to provide a recommendation letter have to be sent to:
cyrille.sabot@univ-rouen.fr & pierre-yves.renard@univ-rouen.fr.

¹ Oueis, E. et al. *Chem. Commun. (Camb.)* **2015**, 51, 12158–12169.

² Lossouarn, A. et al. *Bioconjugate Chem.* **2021**, 32, 1, 63–7.

³ Puteaux, C et al. *Angew Chem. Int. Ed.* **2024**, e202407888.