[Seminar] "A Photoinduced Annulation Strategy Towards a Polycyclic Heteroaromatic Chromophore: Scope, Mechanism, Properties and Applications" by Dr. Marine Labro

Date

Friday, August 22, 2025 - 11:00 to 12:00

Location

Seminar Room L4E01

Description

A Photoinduced Annulation Strategy Towards a Polycyclic Heteroaromatic Chromophore: Scope, Mechanism, Properties and Applications

Dr. Marine Labro, JSPS postdoctoral fellow at Kyoto University

Abstract: This article reports a detailed mechanistic and kinetic study of an unusual photoreaction leading to the (diazonia)tetrabenzonaphthacene skeleton. The photo-triggered double intramolecular nucleophilic aromatic substitution (SNAr*) has been investigated by varying the leaving groups. Photoreaction quantum yields have been determined and mechanistic insights have been supported by theoretical calculations using DFT and TD-DFT methods. Additionally, we show that this light-triggered formed diazonia constitutes a potent photosentitizer with a singlet oxygen generation quantum yield of 0.55, both in organic solvents and in water, which is an extremely relevant value in view of PDT applications or use as an oxidation photocatalyst in aqueous media. Once again, the experimental observations were supported by TD-DFT calculations showing a large density of triplet states below the S1 excited state along with large spin-orbit couplings. The reaction is not restricted to solutions but can also occur in solid PDMS matrices thus allowing for photochemical encoding of information that will progressively vanish upon prolonged UV-exposure.

Bio: Dr. Marine Labro was born in Montpellier, France. She graduated from the École Normale Supérieure Paris-Saclay, where she obtained her Master of Science degree in 2021. She then pursued her doctoral studies in the research group of the Laboratoire de Chimie at École Normale Supérieure de Lyon, France, completing her PhD in 2024. Her research focused on the development of innovative anticancer therapies inspired by both photopharmacology and photodynamic therapy. During her PhD, she received two Best Oral Presentation awards, including one at the international French, Swiss and German Conference on Photochemistry, Photophysics and Photosciences (CP2P'23) held in Mulhouse, France in 2023. She is currently a JSPS postdoctoral fellow at Kyoto University, working in Professor Hiroko Yamada's group. Her current research explores the design and development of photoactive polyaromatic molecules.