

Design of photoactive polymer colloids as tool of a sustainable chemical process



IPREM University of Pau, France

Name of the hosting institution in France	CNRS University of Pau & Pays Adour
Name of the host laboratory / research team	IPREM Institute of research on Materials and Environment
Address	Hélioparc, 2 av. P. Angot, 64053 Pau cedex, France
Website	https://iprem.univ-pau.fr/en/research/scientific-clusters/physico-chemistry-of-surfaces-and-polymer-materials.html
Name of the supervisor	Dr. Maud SAVE
Function	CNRS Senior Researcher
Email	maud.save@univ-pau.fr
Phone number	+33540175014

Internship offer

Topic of the internship (title)	Design of photoactive polymer colloids as tool of a sustainable chemical process			
Proposed dates of the internship	Start	02/09/2024	End	20/12/2024
	3 to 4 months			

Scientific and academic objectives of the internship:

Context of the internship

The overall APOFLOW collaborative research project aims at designing innovative photoactive polymer colloids to achieve sustainable process for photooxygenation of biobased molecules. These colloids will help to intensify the performances (conversion, selectivity and energy-saving) of the LED-driven continuous-flow process while paving the way towards recycling of the photosensitizer (PhotoSens). They require then specific size and structure that will be reached through the implementation of a suitable macromolecular engineering. APOFLOW research project will assess the potential of polymerization-induced self-assembly (PISA) for producing and recovering in a controlled way polymer colloids with a shell functionalized with the PhotoSens. In order to tackle the challenges of increasing the sustainability of the overall process devoted to the photooxygenation of biobased molecules.

Work expected from the intern student.

The work expected from the intern student will be focused on the synthesis and characterization of photoactive polymer colloids. According to the knowledge, skills and scientific interests of the student, the candidate could be involved in various tasks related to either polymer chemistry (synthesis of polymers and colloids by radical polymerization), organic chemistry (synthesis of photosensitizer based monomer), or photochemistry (photooxygenation of biobased molecules under light irradiation). Various analytical techniques will be implemented to characterize the as prepared polymers or molecules: nuclear magnetic resonance, size exclusion chromatography, UV-visible spectroscopy, dynamic light scattering.

Expected outcomes.

Labbook and management of recorded scientific data. A final report is expected containing an introduction, state of the art with literature references, experimental protocols, tables and figures highlighting the scientific results, analysis and discussion of the results.

Industrial partner

Does the project involve a French industry partner?	[Select Yes/No]
Name	[Insert here]
Role of the industrial partner in the internship project	[Insert here]
Main contact	[Insert here]
Email	[Insert here]
Main contact industrial partner's branch in Australia	[Insert here]
Email	[Insert here]

Australian partner

Is the internship project proposed in the framework of an existing collaboration with an Australian partner university?	[Select Yes/No]
Name of the Australian partner institution	[Insert here]
Lab/department/team involved in the collaboration	[Insert here]
Main contact in the Australian partner institution	[Insert here]
Function	[Insert here]
Email	[Insert here]

Outside of this ongoing collaboration, will students from other Australian universities be considered by the hosting institution in France?

[Select Yes/No]

Expected profile of applicant

Level of study	Master
Discipline	Polymer and/or organic chemistry and/or photochemistry
Prerequisite knowledge, qualities and skills	Knowledge in polymer science and/or organic chemistry and/or physico-chemistry
Language of Internship	English
Other specific eligibility criteria	Good communication skills are required and ability to work in collaboration with a team.