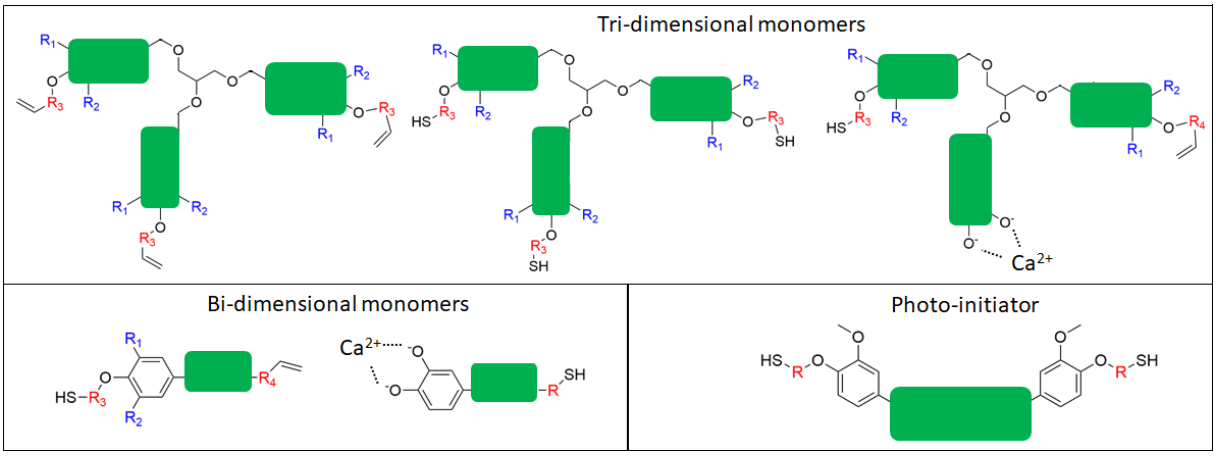
Laboratory Internship (master 2)

Synthesis of biobased monomers for biomedical applications

URD Agro-Biotechnologies Industrielles (ABI) – AgroParisTech
CEBB - 3 Rue des Rouges-Terres, 51110 Pomacle

Host Laboratory: URD ABI - AgroParisTech, located within the Pomacle-Bazancourt biorefinery, is a research and development unit focused to the valorization of sustainable resources. The pluridisciplinary team developed expertise in white biotechnologies, green chemistry, and process engineering. Our laboratory has an expertise in enzymatic catalysis and green chemistry as well as in polymeric chemistry. We also have conducted studies on the development of polymeric materials for biomedical applications.

Work context: The BioSPEC project, granted by EXEBIO Excellence Call, aims to develop biobased and photo-polymerizable bone cements for bone surgery and for dental cares. The main objective of the BioSPEC project is developing biobased and biocompatible monomers and photo-initiators for oxygen insensitive thiol-ene photopolymerization process. Monomers and photo-initiators will be mostly synthesized from biobased phenolic acid or aldehyde and multi functionalized with thiol and allyl moieties. Using caffeic acid with catechol moieties will also likely to improve surface adhesion of the materials onto the inner calcium of the bones or teeth mimicking how mussels are likely to chemically bond themselves onto rocks.



Objectives: The intern will perform organic syntheses in a research laboratory environment. The prepared monomers will then be sent to our academic partners for photopolymerization testing (ICMPE - UPEC) and biocompatibility assays (BIOS - URCA). Green chemistry and sustainable chemical pathways will be preferred to perform the synthesizes, as well as using biobased and biocompatible chemical reagents.

Candidate profile: High knowledge in organic synthesis is the most important skill for the internship. Knowledge in analytical techniques (e.g., NMR, IRTF, TGA, DSC) is desirable but not mandatory. The ideal candidate should also have interest for polymer science and biomedical materials. The internship will start in February or March 2025 for a duration of 6 months. Having a driver license and a car is not mandatory since the CEBB is reacheable by car-pooling or public transportation. Pursuing a master cursus (or equivalent) in an university or engineering school for year 2025 is mandatory.

Contact: Dr. Antoine GALLOS, antoine.gallos@agroparistech.fr