

PhD position in Grenoble

Custom chemical glycosylation of recombinant proteins

Centre de Recherches sur les Macromolécules Végétale (CERMAV)

Team : CBO "Chemistry and Biotechnology of Oligosaccharides"

&

Département de Chimie Moléculaire (DCM)

Team : SERCO "Synthèse et Réactivité en Chimie Organique"

Context

The growing demand for biotherapeutics and industrial enzymes urges us to progress in the glycosylation of recombinant proteins. Glycosylation is naturally occurring on the majority of proteins where it contributes to their solubility, stability and biological activity. While the production of recombinant proteins is nowadays performed industrially, their glycosylation remains poorly controlled. The different protein expression systems present specific glycosylation profiles that may differ from those naturally present on native proteins. They also generate a large saccharide heterogeneity. A process allowing site-specific glycosylation of any recombinant protein with a precise glycan structure is thus desirable.

Objectives

The aim of this PhD project is to develop a versatile chemical approach to protein glycosylation using the unique reactivity of natural but scarce amino acids. These amino acids, present constitutively on the protein or introduced by site-directed mutagenesis, will allow the grafting of oligosaccharides by bio-orthogonal reactions. As a proof of concept, the methodology will be implemented to stabilize an enzyme of the bacterial cell wall metabolism currently being characterized in the context of antibiotic resistance. The influence of glycosylation (nature of the oligosaccharide, number and location of glycosylation sites) on the activity and stability of the protein will be evaluated. The project will be developed within the CBO team (supervision S. Fort  ) at [CERMAV](https://cermav.cnrs.fr) in collaboration with the SERCO team (supervision S. Py) of the [Molecular Chemistry Department](https://www.dcm.univ-grenoble-alpes.fr).

Funding

The project has been selected for funding by the LABEX ARCANE (<https://arcane.univ-grenoble-alpes.fr/>). The candidate will need to pass an audition in front of the ARCANE jury to obtain the PhD scholarship.

Candidate's profile

We are looking for a candidate with a strong interest in interdisciplinary projects at the interface between chemistry and biology. He (She) must have advanced knowledge in organic chemistry, glycochemistry and click chemistry. Knowledge in enzymes and biochemistry would be an asset.

Application

Applicants are invited to submit a full CV, a motivation letter, academic transcripts for Master 1 and 2, two recommendation letter(s) by email to Sébastien Fort (sebastien.fort@cermav.cnrs.fr) and Sandrine Py (sandrine.py@univ-grenoble-alpes.fr)

Deadline: 31/03/2023