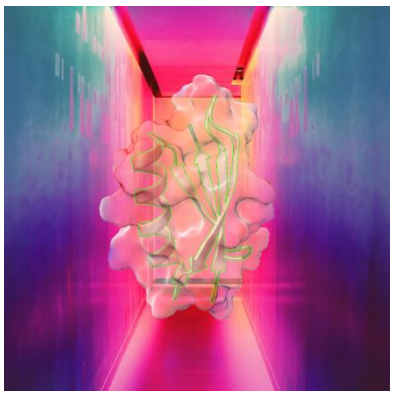
Miniproteins & therapeutics team

Team leader Dr Oleg Melnyk



https://mint-team.fr/

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PhD in synthetic organic chemistry and protein chemistry

The last two decades have seen the rise of chemical protein synthesis, which complements biotechnological methods that utilize living systems for protein production, with the advantage of creating tailor-made tools to decipher biological processes.

One of the factors explaining this remarkable evolution is the emergence of a new class of chemoselective reactions called native ligation reactions. These reactions are characterized by the formation of native peptide bonds in aqueous environments through the reaction of unprotected peptide segments. Their application has enabled the production of homogeneous batches of large proteins, sometimes composed of more than 300 amino acids, and highly functionalized with total control of their structure at the atomic level. Naturally, native ligation reactions have found numerous applications in the study of protein function, as well as in medicinal chemistry, materials science, and nanotechnology.

Despite the many developments in this field over the past 30 years, total protein synthesis is often limited by:

- The low solubility of peptide segments and synthesis intermediates in aqueous environments
- The formation of by-products during segment preparation and/or during ligation steps
- The limited diversity of peptide junctions that can be formed by chemical ligation

The aim of this thesis project is to develop new concepts and experimental approaches to overcome the limitations mentioned above. Essentially, this is a thesis in organic synthesis. The reactions will be carried out on model peptides produced by chemical synthesis before being applied to protein production. Therefore, the project includes the chemical synthesis of functionalized peptide segments, catalysts, and the development of chemoselective ligation reactions that operate in water and under mild conditions. The thesis work will require the use of a wide range of analytical tools commonly used in organic synthesis and for the characterization of biomolecules (NMR, LC-MS, HPLC, mass spectrometry, circular dichroism, etc.).

The thesis will be carried out in the Miniproteins & Therapeutics team (MINT) of the Center for Immunity and Infection of Lille (CIIL), on the campus of the Institut Pasteur of Lille (Lille, France).

Web site: https://mint-team.fr/

Type of contract: Fixed-term doctoral student/Doctoral CNRS contract
Contract duration: 36 months
Thesis start date: January 1, 2025
Work quota: Full time
Remuneration: The remuneration is a minimum of €2,135.00 monthly

To apply, use exclusively the CNRS job portal:
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