What is the ExposUM Doctoral Nexus?

The Doctoral Nexus proposed by the ExposUM Institute are networks of 3 to 4 PhD students from different disciplines and affiliated to at least two different research units.

Compared with a traditional PhD, taking part in a Doctoral Nexus will encourage the ability to work in a team and to design projects in a transdisciplinary way while deepening one's own field of expertise.

A specific teaching programme will be offered and the doctoral students concerned will also have the opportunity to organise a seminar within the Nexus network.

Theses are funded from the outset for 4 years, including the PhD student's salary and an environmental allowance

Title: **Development and application of computational approaches to study the mechanisms of microbe-induced amyloidogenesis.**
Planned start date of thesis: 01/10/2025
Thesis supervisor: **Andrey KAJAVA, CRBM UMR 5237 CNRS, CBS2 doctoral school.**

Although significant progress has been made in the characterization of some proteins involved in the disease-related amyloid formation, the elements triggering their accumulation within the human body remain poorly understood. In the last decade, an increasing number of cases of microbe-induced amyloidosis have been described. Based on this existing knowledge, we hypothesize that some microbial proteins can trigger amyloid fibrillation of human proteins via co-aggregation.
The main objective of our project is to develop computational tools for prediction of exogenous microbial proteins that can trigger amyloidosis in humans. This will pave the way for subsequent experimental tests that can be performed by the collaborators. To achieve the project objectives, we aim to develop bioinformatics tools that predict protein co-aggregation which will leverage knowledge of amyloid structures and, in particular, incorporate AI approaches.

Our team uses bioinformatics and computational biology methods to understand the principles of protein structure and biomolecular interactions. We are developing computational tools that enable large-scale, high-quality structural annotation of proteomes. (see https://bioinfo.crbm.cnrs.fr/index.php?route=home).

Candidate Profile: We seek a highly motivated student with a background in IT, strong programming skills (including Python), and a basic understanding of biology. The ideal candidate should have a good command of English, strong communication skills, and a keen interest in multidisciplinary research.

The scientific environment of the CRBM is international, multidisciplinary and very dynamic, in particular thanks to interactions with neighbouring institutes, and its resolutely collaborative and convivial spirit. Montpellier is a dynamic Mediterranean city with an exceptional environment, culture and quality of life.

This project is part of a Nexus involving the groups of Fabrice Caudron (IGMM) and Sylvie Claeysen (IGF).

Application procedure

The application must include the following

- a CV
- a letter of motivation
- a copy of the degree required for registration (Master 2 degree)
- Transcripts of all courses (with marks) taken since the start of your university studies any additional specific information requested by the doctoral school CBS2 https://edcbs2.umontpellier.fr/
- names of at least two persons who can provide recommendation letters
- If you would like to apply for this position, please send an e-mail to Andrey KAJAVA (andrey.kajava@crbm.cnrs.fr) and exposum-aap@umontpellier.fr to inform them of your interest.

Before Monday 31 May, 2:00 PM CET

The University of Montpellier

KEY FIGURES

RESEARCH CENTERS

From space exploration and robotics to ecological engineering and chronic diseases, UM researchers are inventing tomorrow's solutions for mankind and the environment. Dynamic research, conducted in close collaboration with research organizations and benefiting from high-level technological platforms to meet the needs of 21st century society.
The UM is committed to promoting its cutting-edge research by forging close links with local industry, particularly in the biomedical and new technologies sectors.
More Information: https://www.umontpellier.fr/en/recherche/unites-de-recherche

SCIENTIFIC APPEAL

Open to the world, the University of Montpellier contributes to the structuring of the European higher education area, and strengthens its international positioning and attractiveness, in close collaboration with its partners in the I-SITE Program of Excellence, through programs adapted to the major scientific challenges it faces.
More Information: https://www.umontpellier.fr/en/international/attractivite-scientifique