

## Investigating the structural transitions during $\alpha$ -synuclein phase separation and aggregation

*Three-Year PhD position held jointly between the Dept. Pharmacy at the University of Copenhagen (Denmark) and the Institut Laue Langevin (ILL, Grenoble, France)*

**Project:** Liquid-liquid phase separation (LLPS) is a key process in living systems and consists in the formation of dense phases of biomolecules, often named biocondensates. Proteins can undergo LLPS and the dense phase can also convert into a solid phase, such as amyloid formation, often associated with neurodegenerative diseases. Current *in vitro* studies on medically relevant proteins do not access the structural transition undergoing into the dense phase prior to solid transition. This hinders the understanding of the interprotein interactions triggering the condensation and the solid transition and determining the type of aggregate structures. The project aims at establishing an experimental workflow for the analysis of the structural reorganization of a protein ensemble covering the transition from the dilute to the dense and eventually to the solid state by Small Angle Neutron Scattering combined with advanced microscopy and spectroscopy methods. The project focuses on the protein  $\alpha$ -synuclein (aSN), which is involved in the onset of Parkinson's disease.

**Info on the groups:** Information about the research group of Prof. Vito Foderà can be found [here](#) and [here](#). Information about Asst. Prof. Federica Sebastiani can be found [here](#).

**Candidate:** We are seeking a highly motivated PhD candidate with a master's degree in physics, chemistry, nanotechnology, (bio)physics or related areas. Knowledge of biochemistry, scattering techniques or computational approaches will be considered an advantage. We are offering an international and interdisciplinary working environment and close contact with experts in neutron scattering, protein production and molecular modelling. An initial period of 12 months will be spent at the Dept. Pharmacy (University of Copenhagen) and the rest of the project will be mainly based at the ILL. The student will work on cutting-edge largescale instrument, on a highly multidisciplinary campus located at the heart of the French Alps. The candidate will be employed for a period of three years at the Institut Laue Langevin (Grenoble, France).

Details about the salary and working conditions can be found at <https://www.ill.eu/careers/all-our-vacancies/phdrecruitment/phd-work-at-the-ill>.

General information about PhD studies at the Faculty of Health and Medical Sciences is available at the Graduate School's website: <https://healthsciences.ku.dk/phd/>.

**Application:** Applications and informal queries about the project and the labs should be addressed to Vito Foderà ([vito.fodera@sund.ku.dk](mailto:vito.fodera@sund.ku.dk)), Federica Sebastiani ([federica.sebastiani@sund.ku.dk](mailto:federica.sebastiani@sund.ku.dk)) and Lionel Porcar ([porcar@ill.fr](mailto:porcar@ill.fr)).

Please title your email: "ILL-DK your name"

Applications should include the following parts merged in 1 single pdf document:

- 1) cover letter describing the research interests, motivation and qualifications for the project (max. one page)

- 2) CV incl. education, experience, language skills, possible publication list (if any), other skills relevant for the position, and names, e-mails, telephone numbers and addresses of 1-2 referees
- 3) Certified copy of original Master of Science diploma and transcript of records in the original language, including an authorized English translation if issued in other language than English or Danish. If not completed, a certified/signed copy of a recent transcript of records or a written statement from the institution or supervisor is accepted. As a prerequisite for a PhD fellowship employment, your master's degree must be equivalent to a Danish master's degree. We encourage you to read more in the assessment database: <https://ufm.dk/en/education/recognition-and-transparency/find-assessments/assessment-database>. Please note that we might ask you to obtain an assessment of your education performed by the Ministry of Higher Education and Science. Applicants with a Master's degree from abroad should also enclose a short description of the grading scale used
- 4) 1 recommendation letter (max 1 page).

Only short-listed candidates for the interview will be informed about the outcome of the application.

**Deadline for application: December 10<sup>th</sup> 2024. The project is expected to start in Spring 2025**