



The role of metallic nanoparticles in amyloid condensates and aggregates

Dr. Luo Junghui (Paul Scherrer Institute) and Prof. Dr. Sebastian Hiller (University of Basel)

We are seeking a highly motivated PhD candidate to investigate the role of metallic nanoparticles in amyloid aggregation that leads to neurodegenerative disease. The successful candidate will be employed by the Paul Scherrer Institute and will be enrolled within the graduate school of the Swiss Nanoscience institute at University of Basel. This interdisciplinary and collaborative project, led by the Luo and Hiller labs at PSI Villingen and Biozentrum, University of Basel. The project aims to unravel how metal ions cause amyloid proteins to aggregate and condense, leading to the creation of metallic nanoparticles with a zero-oxidation state. The ultimate goal is to gain insights for the development of new therapeutics for neurodegenerative diseases.

Your Responsibilities:

- Evaluate metal elements, metallic nanoparticles in postmortem brain tissues of individuals with neurodegenerative diseases by using X-ray microspectroscopy and energy SEM-dispersive X-ray (EDX) analysis.
- Investigate how amyloid proteins, particularly Alzheimer's A β and Parkinson's α -synuclein, induce the formation of metallic nanoparticles in coacervation through the use of biophysical techniques such as NMR spectroscopy and X-ray absorption spectroscopy.
- Characterize the cellular toxicity and potentially harmful effects of metallic nanoparticles and metal-protein coacervates using cell viability assays and other biochemical assays.
- Collaborate with other group members, utilizing the facilities and resources available at the PSI and Biozentrum Basel
- Co-supervise and co-support master and bachelor students.
- Present work at international conferences/workshops and publish work.

Your Profile

- Good background in protein aggregation, amyloid research, or metal-protein interactions.
- Experience with biophysical techniques such as NMR spectroscopy or soft X-ray absorption spectroscopy.
- Knowledge of neurodegenerative diseases and their molecular mechanisms.
- Ability to work independently as well as collaboratively in a multidisciplinary team.
- Excellent communication and scientific writing skills.

This is an exciting opportunity to contribute to cutting-edge research in the field of neurodegenerative diseases and metal-protein interactions. The successful candidate will have access to state-of-the-art facilities and resources, as well as the opportunity to collaborate with experts in the field. If you are passionate about unraveling the mysteries of neurodegenerative diseases and making a meaningful impact on healthcare, we encourage you to apply. You will be embedded at the interface of two research groups, in a highly stimulating collaborative research environment. Both the PSI Villingen and the Biozentrum Basel feature fantastic infrastructure including state-of-the-art technology platforms for cutting-edge interdisciplinary research, as well as a lively scientific community.

To apply, please send a cover letter, curriculum vitae (CV), and contact information for 2-3 references to Jinghui Luo (jinghui.luo@psi.ch)

- [Luo lab website](#)
- [Hiller lab](#)
- [Paul Scherrer Institute](#)
- [Biozentrum, University of Basel](#)
- [Swiss Nanoscience Institute](#)