CRBM external seminar
Thursday, February 29th, 2024 11:00 am Salle Marcel Dorée

From amyloid polymorphism to biological consequences: example with alpha-synuclein fibrils.

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Luc Bousset completed his PhD in 2002 at the CNRS in Gif sur Yvette on the structure and function of the yeast prion Ure2p. He continued as a post-doc at the EMBL in Grenoble in the team of S. Cusack, studying RNA-protein complexes. In 2006, he was hired as a CNRS researcher in the team or Ronald Melki, where he focused on protein folding and misfolding diseases. In 2020, he joined the team of Marc Dhenain to work on structural characterization of tau and beta-amyloid aggregates in vitro and in animal models.

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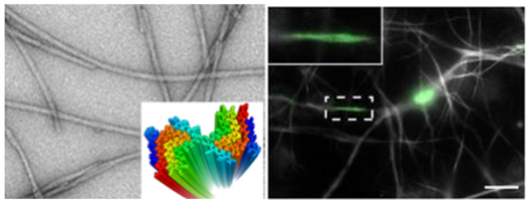
Abstract

Amyloids are abnormal protein aggregates associated with various neurodegenerative diseases. The proteins at the origin of amyloids have revealed their ability to adopt diverse structural folds, known as amyloid polymorphism. Focusing on alpha-synuclein protein fibrils, our studies investigate the impact of polymorphism on biological systems. Alpha-synuclein is implicated in Parkinson's disease and related neurodegenerative disorders. Our results shed light on how different fibril structures influence cellular processes, and stress the need for structural characterization of amyloids strains in order to generate relevant cellular or animal models of amyloid diseases.



Selected publications

Shrivastava AN, **Bousset L**, Renner M, Redeker V, Savistchenko J, Triller A, Melki R (2020) Differential Membrane Binding and Seeding of Distinct α-Synuclein Fibrillar Polymorphs. **Biophys J**. 118:1301-1320.

Guerrero-Ferreira R, Taylor NM, Arteni AA, Kumari P, Mona D, Ringler P, Britschgi M, Lauer ME, Makky A, Verasdonck J, Riek R, Melki R, Meier BH, Böckmann A, **Bousset L**, Stahlberg H (2019). Two new polymorphic structures of human full-length alpha-synuclein fibrils solved by cryo-electron microscopy. **Elife** 8:e48907.

Peelaerts W, **Bousset L**, Van der Perren A, Moskalyuk A, Pulizzi R, Giugliano M, Van den Haute C, Melki R, Baekelandt V (2015) α-Synuclein strains cause distinct synucleinopathies after local and systemic administration. **Nature** 522:340-4.