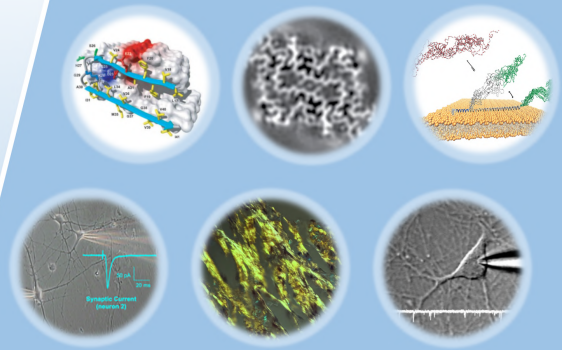


# *Protein misfolding and aggregation in disease*



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Organizers: Fabrizio Chiti, Mario Nuvolone, Stefano Ricagno.

## List of abstracts selected for oral presentation (order of appearance)

## DEVELOPMENT OF NMR METHODOLOGIES FOR FINGERPRINTING OF NEUROLOGICAL DISEASES: ALPHA-SYNUCLEIN AS A CASE STUDY.

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### Abstract

Clinical diagnosis of alpha-synucleinopathies, such as Parkinson's disease (PD), multiple system atrophy (MSA) and dementia with Lewy bodies (DLB), is challenging, especially in the early stages. However, each disease is associated with distinct conformers of misfolded alpha-synuclein, which form typical protein aggregates in the brain and represent key disease biomarkers. This project aims to create disease fingerprints for patient stratification and monitoring of disease progression, to improve diagnosis and treatment. The seed amplification assay (SAA) has been widely used to amplify aggregates present in biological fluids of patients through a cyclical process.<sup>[1,2]</sup> SAA will be used to detect and amplify pathological alpha-synuclein in olfactory mucosa (OM), and other biological fluids, of patients affected by PD, MSA, and DLB. The structure of the seeded aggregates will be characterized by high resolution solution and solid-state Nuclear Magnetic Resonance (NMR) to create disease fingerprints useful for an early-stage diagnosis, addressing the limitations of clinical interpretation.

NMR data on a sample model of alpha-synuclein aggregates have been here recorded to develop the methodology.

### References:

- [1] C. M. G. De Luca, A. E. Elia, S. M. Portaleone, et al. *Translational Neurodegeneration* **2019**, *8*, 24.
- [2] C. Bargar, C. M. G. De Luca, G. Devigili, et al., *Molecular Neurodegeneration* **2021**, *16*, 82.