

ICB PhD public presentations**THE EFFECTS OF SURFACES
AND HYDRODYNAMIC STRESS
ON ABERRANT PROTEIN
AGGREGATION****Fulvio Grigolato**

ICB/Biochemical Engineering Laboratory
Supervisor: Prof. Dr. Paolo Arosio
Co-examiner: Prof. Dr. Marco Mazzotti



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Zoom Meeting ID: 982 6182 0902

Project Summary: Protein self-assembly underlies crucial problems in biology and biotechnology, ranging from the formation of pathogenic amyloid fibrils in neurodegenerative disorders to the aggregation of undesired protein particles in the manufacturing of biotherapeutics. My PhD focused on the development of theoretical and experimental approaches to investigate the molecular mechanisms underlying surface- and flow-induced protein self-assembly, which is of paramount importance to develop rational strategies to avoid aggregation. First, I will discuss challenges associated with the intrinsic variability of in vitro assays for investigating amyloid self-assembly. Then, I will present a high-throughput assay based on a combination of nanoparticles and chemical kinetic analysis to quantify and rationalize the effect of surfaces and mechanical agitation on amyloid formation. I will further illustrate the synergistic interplay between interfacial and hydrodynamic stresses on the flow-induced aggregation of therapeutic proteins. The results presented open the way to new platforms for investigating and controlling surface-induced protein aggregation in the absence or presence of flow.

CV: Fulvio Grigolato obtained his double M.Sc. degree in Physics of Complex Systems from Politecnico di Torino and from Université Pierre et Marie Curie (Paris VI, Sorbonne) in 2016. In the same year, he joined the Arosio group for his doctoral studies.