CHEMICAL ENGINEERING

Ammin/DISAT/F.I.S. S.p.A. - Precipitation and Isolation of New Chemical Modalities

Funded By	F.I.S. FABBRICA ITALIANA SINTETICI S.P.A. [P.iva/CF:01712670247] Dipartimento DISAT Politecnico di TORINO [P.iva/CF:00518460019]
Supervisor	SIMONE ELENA - elena.simone@polito.it
Contact	MARCHISIO DANIELE - daniele.marchisio@polito.it
Context of the research activity	A PhD position in Precipitation and Isolation of New Chemical Modalities is available at the Politecnico di Torino (Italy). The studentship will be supervised by Prof. Daniele Marchisio and Prof. Elena Simone, in collaboration with an Italian pharmaceutical company. The prospective student will join a multidisciplinary and international team, and they will work closely with molecular modelers, chemists, crystallographers and engineers.
Objectives	New chemical Modalities (NCMs) such as Protein Degraders, Molecular Glues, Peptides, Oligonucleotides and RNA therapeutics are emerging as novel promising pharmacological entities for the pharma industry. These diverse structural types have the potential benefit to address a wide range of therapeutic areas, from the oncological to the immunological field. Owing to their often-complex structure, large molecular weight coupled with increased flexibility, the isolation and purification of these NCMs can be more challenging than standard active pharmaceutical ingredients. In fact, for NCMs chromatography, nanofiltration or other highly selective unit operations are preferred to the standard, more sustainable and more more economically convenient crystallization. The aim of this project is to investigate and design novel, optimized crystallization processes to purify and isolate NCMs. The prospective PhD candidate will perform both experiments (synthesis and characterization of solid crystalline materials) and simulations using population balance and computational fluid dynamics modelling. The project will involve the use of material characterization technologies, such as X-ray scattering, differential scanning calorimetry and Raman confocal microscopy and in situ spectroscopy, and advanced mathematical tools (e.g., machine learning).
Skills and competencies for the development of the activity	A master degree (or equivalent) in Chemical Engineering, Chemistry, Physics or a related subject is an essential requirement. The degree must be awarded by the start time (before December 2024). Some basic knowledgeof crysta lization and computational fluid dynamic might be desirable.