

CHEMICAL ENGINEERING

DISAT - Development of novel soft materials to improve food sustainability and nutritional properties

Funded By	Dipartimento Scienza Applicata e Tecnologia [Piva/CF:00518460019]
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Context of the research activity	Obesity is a global issue that needs urgent tackling. Overconsumption of fats is one of the main causes of obesity; fats have a high content of calories but they also provide texture, smoothness and flavor to food products. For this reason their reduction or replacement in food products is a difficult technological challenge. The aim of this project is to develop novel soft materials that can act as fat replacers in food products.
Objectives	<p>The prospective student will join the Crystal Engineering and Crystallization Group at PoliTO and, they will contribute to the project Cryform (https://cordis.europa.eu/project/id/949229) , led by Dr Elena Simone and funded by the European Research Council. In the context of CryForm the student will develop novel crystalline soft materials that can replace traditional fats in novel food products. In particular, crystalline oleogels and oleogel based oleocolloids (e.g., oleofoams, oleogel stabilized emulsions) will be developed using a wide variety of edible oils. Different types of oleogelators, including agri-food residues, will be investigated focusing on the understanding of the key process-structure-function relationship, which links the starting ingredients with the functional properties (e.g., release of nutrients) of the final food product. The project will involve mainly experimental work for the production and characterization of the produced oecolloids, and theoretical engineering considerations for the design and scale up of processes that can manufacture these novel materials.</p> <p>The student will have the chance to gain experience in characterization techniques such as X-ray scattering (benchtop and synchrotron), rheology, polarized and electron microscopy and thermal analysis. The Crystal Engineering and Crystallization laboratory at PoliTO is equipped with instrumentation for the synthesis and characterization of soft materials at scale from the microliter (CrystalBreeder, Crystal16) to the liter. Collaboration with international partners (Wagenigen University in the Netherlands, KU Leuven in Belgium, University of Leeds in the UK) are expected during the project, as well as attendance to conferences and training schools.</p>
Skills and competencies	

**competencies
for the
development of
the activity**

The desired candidate will have an MSc in Chemical or Process Engineering or Chemistry. Experience in food processing and technology is a plus.