



**Politecnico
di Torino**

PRESS RELEASE

A SUSTAINABLE REVOLUTION FOR DRUGS, AGRICULTURE AND FOOD INDUSTRY OF THE FUTURE: CRYFORM PROJECT STARTS AT THE POLITECNICO DI TORINO

This European project aims to replace synthetic stabilizing agents in drugs, agricultural and food components with natural, biocompatible and biodegradable crystalline materials to create innovative formulations that are safe, sustainable and more affordable

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Recent progress in **pharmacology** and **biotechnology** has led to a dramatic increase in power and specificity of **new generation drugs, active agrochemical ingredients** and **food nutraceuticals**. At the same time, a problem remains in making these substances water soluble, because of their high molecular weight and complex structure. Multiphase systems - such as emulsions, foams and creams - can solve this problem but are traditionally produced with synthetic stabilizing agents, which can make them unsafe and contribute to CO₂ production.

CryForm (*Crystal Engineering the New Generation of Sustainable, Biocompatible and Stimuli Responsive Formulations for the Delivery of Active Ingredients*), a European project conceived by **Prof. Elena Simone** – associate professor at the **Department of Applied Science and Technology-DISAT** at the **Politecnico di Torino** - aims at replacing synthetic stabilizing agents with **crystalline materials** that are **natural, biocompatible and biodegradable**, that can enable the design of innovative multiphase formulations, that are easily soluble and able to deliver active ingredients in a controlled way, to be used in the agrochemical, pharmaceutical and food industry.

The project has three fundamental objectives that will make this “revolution” possible: the study of the relation between crystalline structure and macroscopic properties of solid particles, the analysis of the thermodynamic and kinetic mechanisms of crystal nucleation and growth, as well as and the understanding of the role of large biomolecules in in the kinetic stability of solid crystals. These elements will allow substantial progress of the current fundamental understanding of crystallization of organic materials and allow the **development of formulations that can be used for pharmaceutical, agrochemical and food products that are safer, more sustainable and also more affordable.**

The project tackles a major **crystal engineering** challenge and will generate new knowledge essential for the whole crystallization community. In particular, it will enable the design of biocompatible, safe and sustainable crystals to be used for **pharmaceutical and cosmetic formulations**, and to develop **new products for the food and agriculture industry** that are able of **controlled release of active ingredients**. In general, the project will contribute to the development of **more sustainable manufacturing processes also at the industrial scale** and will help the transition of the European Union to a modern and competitive economy, efficiently using resources, as it is necessary to achieve the **European Green Deal**.

*“The aim of CryForm is to get a better understanding of organic crystalline materials and use it to develop complex products and formulations for food, pharma and agrochemicals – explains **Elena Simone** - I am very excited to start this project, which will allow me to work with many brilliant scientists from different disciplines and to create new collaborations with academia and industry”*



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