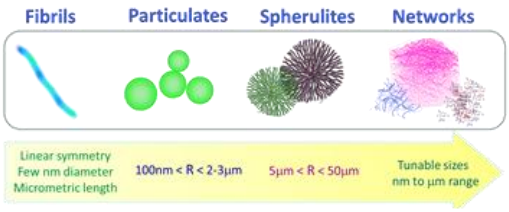
Vito Foderà
Associate Professor, PhD
13, 3, 332 Email: vito.fodera@sund.ku.dk

Research focus:
Protein science; neurodegenerative diseases; biomaterials for drug delivery;
X-ray and neutron science, microscopy and optical and IR spectroscopy
If you want to look at my research focus, please visit: https://www.vitofodera.com/

Examples of projects *NB: we can design the project that suits you best. Come and talk to us!*

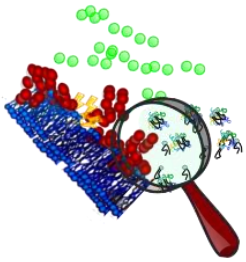
Role of Protein-Protein interactions in the formation of protein superstructures

Protein-protein interactions are regulated by the physico chemical properties of the solution. Co-solvents (e.g. alcohols), pH and mechanical stress strongly affect such interactions having as a final result the modification of the aggregation reaction. With this project we want to investigate what is the effect of different parameters on both the kinetics of formation and the structure of superstructures.



Supervisor: Vito Foderà and Marco van de Weert

Amyloidogenic protein interaction with cell membranes

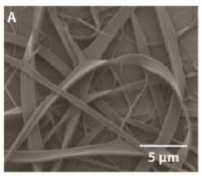


The formation of amyloid fibrils is considered to play a key role in the development of pathologies such as Parkinson's and Alzheimer's diseases. New view supports the concept that the interactions of amyloidogenic proteins with cell membranes are a key factor in regulating related toxicity mechanisms. Aim of this project is to directly observe the progression of amyloid fibril formation in the presence of membranes both in synthetic model systems and in living cells.

Supervisor: Vito Foderà and Jijo Vallooran

Protein-based biomaterials for drug delivery

A new frontier in protein self-assembly is represented by the analysis of the protein aggregate in terms of its mechanical/structural properties. This is pivotal for the use of protein aggregates as biomaterials for drug delivery. Aim of this project is to design and produce protein-based materials using different processing methodologies, from electrospinning techniques and bulk methods to microfluidic chips.



Supervisor: Vito Foderà and Jijo Vallooran

Protein stability in pharmaceutical formulations

The presence of protein aggregates in protein drug products is a major concern in pharmaceutical industry. These particles may alter the efficacy of the product. As a consequence, it is of great relevance to isolate and characterize each of these types of particles and evaluate their risk profile. Aim of this project is to produce and analyze homogeneous populations of protein aggregates originated from insulin formulations.

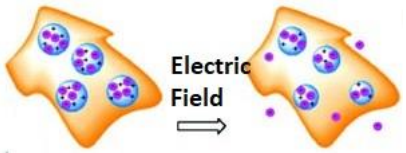
Supervisor: Vito Foderà + company supervisor

Jijo Vallooran
Assistant Professor
13, 3, 315 Email: jijo.vallooran@sund.ku.dk

Research focus:
Lipid and Protein Self-assembly; Nanostructured biomaterials for drug delivery; Nanostructured material characterization using Scattering Techniques.

Electric field assisted drug delivery from Protein biomaterials

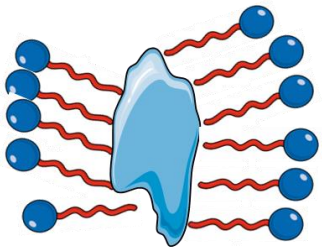
Stimuli-responsive or "smart" protein biomaterials are of great interest in the fields of biopharmaceuticals and medicine. Drug delivery systems based on stimulus responsive materials for controlled and long-term drug release under external electric field offer the promise of new treatments for chronic diseases that require daily injections or precise doses of medication. Aim of this project is to study the effect of electric field on protein-based materials and its suitability for drug-delivery.



Supervisor: Jijo Vallooran and Vito Foderà

Improving biopharmaceutical stability using Lipids

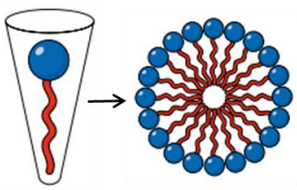
Formation of aggregates in biopharmaceutical formulation continues to be one of the major quality concerns in biotherapeutics development. The presence of large quantities of aggregates is believed to be one of the causes of unwanted immunogenic responses. Protein particulates can form in a wide range of sizes and shapes. Lipids can generally bind on proteins and peptides, which could lead to improved stability. Aim of this project is to inhibit the protein aggregation in presence of medium-chain fatty acids and lipids.



Supervisor: Jijo Vallooran, Marco van de Weert and Vito Foderà

Designing compact lipid nanostructures for oral drug-delivery

Oral drug delivery is the most preferred and convenient route of drug administration due to high patient compliance, cost-effectiveness, and flexibility in the design of dosage form. Due to the excellent biocompatibility and ability to solubilize both hydrophilic and hydrophobic drugs, lipid nanostructures are prominent nano-carriers for oral drug-delivery. However, the effectiveness of these lipid nanostructures can be significantly reduced due to lipase enzymatic digestion in the stomach as well as pH dependent structural changes. Aim of this project is to design compact lipid nanostructures, which does not affect by intrinsic physiological factors.



Supervisor: Jijo Vallooran, Vito Foderà and Hanne Mørck Nielsen