



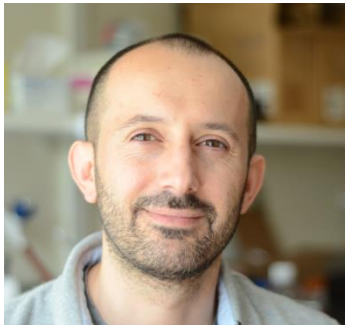
Università
Ca' Foscari
Venezia

Dipartimento di
Scienze Molecolari
e Nanosistemi

II DSMN si racconta

28-29 Maggio 2019

Campus Scientifico, Aula delta 1B



28.05.19 ore 09.30 Alessandro Angelini
Molecular evolution of peptides and proteins for biomedical and biotechnological applications

The immediate biomedical and biotechnological application of naturally occurring peptides and proteins is often hindered by their intrinsic weak binding affinities, poor selectivity and low stability. To overcome these limitations, we apply in vitro display technologies to develop molecules with superior chemical and physical properties. By using these methodologies peptides and proteins of interest are evolved according to Darwinian principles including diversification, selection and amplification. The engineered molecules are further produced and characterized using a broad range of analytical methodologies. Examples of different ongoing peptide and protein engineering projects and their potential applications will be presented.



28.05.19 ore 10.30 Bessem Chouaia
Bacteria symbionts as drivers of adaptation in insects

Bacteria have long been known for their contribution to the evolutionary success and adaptation of insects. The most prominent examples are nutritional symbioses where intracellular bacteria provide nutrients lacking from their host's diet. In recent years, the focus has been shifted toward commensal bacteria. Historically, gut symbionts were thought to be of little importance. This has changed in the last decade with the advent of more sophisticated investigation techniques allowing for a more holistic view. In this talk, I will present models of insect symbiosis where the bacteria provide an important service helping the insect to better adapt to its environment.



28.05.19 ore 11.30 Flavio Rizzolio
From cancer biology to nano-therapies

Cancer patients need tailored therapies to improve efficacy and reduce toxicity. In order to succeed with this approach, novel biological targets, models for testing and drug formulations are necessary. In the last years, utilizing molecular biotechnologies and cellular biology, our group identified new candidate oncogenes for ovarian and colon cancers. These proteins are currently studying as potential targets of therapies. In collaboration with the National Cancer Institute of Aviano, we are building an innovative biobank of 3D tumoroids and organoids from healthy tissues. Tumoroids are lab-built mini-tumors that can serve as models of cancer. In this order, it appears evident the great application of tumoroids and organoids into predicting how an individual will respond to a drug, making organoids a highly valuable tool in the implementation of precision medicine. New targeted and nano-approaches will be discussed that are currently developed in our laboratory.



29.05.19 ore 09.30 Federica Menegazzo
Innovative Nanomaterials for applications in Sustainable Processes, Cosmetic and Cultural Heritage

My research activity is focused on the development of nanoporous and nanostructured materials, their characterization and the investigation of their applications. In particular, I'm interested in catalysis for industrial, environmental and energetic processes, design of cosmetic and pharmaceutical formulates, materials for green building and cultural heritage. In this communication, I will present recent advances on these topics:
Energy relies on hydrogen: how to obtain it by renewable sustainable sources?
Formulation of highly performant cosmetics from natural raw materials
Synthesis of multi-functional materials for applications in the traditional venician "marmorino".



29.05.19 ore 10.30 Marta Strani
The phenomenon of metastability in some partial differential equations

In this talk I will give an **overview** of the so called "metastable dynamics" of the solutions to some hyperbolic and parabolic PDEs, some of which describe physical phenomena as phase transitions and the dynamics of fluids. Roughly speaking, a metastable behaviour appears when the time-dependent solution of an evolutive PDE approaches its steady state (i.e. a solution to the equation that does not depend on time) in an exponentially long time interval, which can be longer as soon as the viscosity parameter ε (which "quantifies" the intensity of the diffusion) goes to zero. A large class of evolutive PDEs, concerning many different areas, exhibit such behaviour: among others, we include viscous shock problems (modeled by the viscous Burgers equation), phase transition problems (described by the Allen-Cahn and Cahn-Hilliard equations) and equations arisen in fluid dynamics (Euler and Navier-Stokes equations).



29.05.19 ore 11.30 Giulia Fiorani
Towards Bio-based Organic Carbonates and Polycarbonates via Coupling of Highly Substituted Oxiranes and CO₂

Non-reductive CO₂ coupling reactions using highly reactive substrates (such as oxiranes) can be regarded as a topical milestone within the field of CO₂ conversion. These processes require an appropriate catalytic system comprising both a Lewis acid catalyst (M) and a nucleophile (Nu) and can selectively lead to heterocyclic scaffolds or CO₂ based polymers. The majority of this research focuses on petro-derived epoxides and CO₂, although promising recent reports highlight the potential for bio-derived epoxides. (1) In particular, CO₂ coupling with challenging di- and tri-substituted oxiranes can expand both the scope and possible applications of organic carbonates and polycarbonates. Here we report the application of reported highly active catalytic systems, i.e. Al^{III} amino-triphenolate complexes which are an interesting class of modular, homogeneous catalysts highly active towards cyclic carbonate formation (2) and bimetallic macrocycles and metal salen systems which are selective towards polycarbonate formation, (3) aiming at development of selective processes towards the formation of either cyclic or polycarbonate structures. An appropriate substrate scope will be presented, highlighting the similarities with renewable, naturally occurring compounds. (4) The structural properties of the resulting cyclic and polymeric products will also be discussed being of interest for practical applications.