Università degli Studi di Padova

DiSC

Venerdì **26 Maggio 2015** alle ore **14:30** presso l'aula A

il Prof. Nicola Tirelli

Italian Institute of Technology (IIT)
Genova, Italy

terrà il seminario dal titolo:

Polymers that Respond to Oxidants

This talk is about organic macromolecules containing sulphur(II) species, mostly thioethers (sulfides) but also thioacetals. The main characteristic of such materials is the capacity to react with oxidants (including biologically relevant inflammatory mediators), which turn sulphur to higher oxidation states ((IV) or (VI)). Due to the large dipole moments of sulfoxides and sulfones, such oxidation is accompanied by a large change in polarity, which can trigger significant reorganizations, *e.g.*, disrupting hydrophobically driven self-assembly processes, and be followed by the delivery of encapsulated molecules.

In our group, we have long experience with such a class of materials, ranging from the application of synthetic techniques for the fine control over primary structure or macromolecular architecture, to their use directly as therapeutic agents (due to the anti-inflammatory effects of ROS removal), as replacements for PEG, or their oxidatively stimulated release of pharmaceutically active agents.

In the talk we will review the current state of knowledge for polysulfides, commenting also on the differential sensitivity of these sulphur groups to oxidants: thioethers, for example, are substantially unresponsive to some oxidants such as superoxide, which on the contrary react readily with polysulfides. We will also discuss the combination of oxidation responsiveness with, *e.g.*, thermal sensitivity. We will then focus on the range of anti-inflammatory effects that such materials can have, following their scavenging of extracellular oxidants (Reactive Oxygen Species, ROS). We will then finally focus on the concept of sacrificial oxidation, where the ROS scavenging action is used to increase the stability of cargos (proteins) against oxidative damage in a biological environment.

La presenza della S. V. sarà molto gradita

Prof. Edmondo M. Benetti (DISC)
Prof. Gianfranco Pasut (DSF)

Il Direttore del Dipartimento
Michele Maggini