AVVISO DI SEMINARIO

martedì 5 aprile alle ore 15:00
Aula Seminari del Dipartimento di Scienze e Tecnologie Chimiche, il Prof.ssa Debora Berti

Università di Firenze

Terrà un seminario dal titolo:

Nanostructured materials meet lipid bilayer membranes: a colloidal perspective

Proponente: Prof. Gaio Paradossi
**Abstract:**

*Debora Berti, University of Florence and CSGI*

Biomembrane activity of inorganic or polymeric nanoparticles (NP), defined as the tendency to structurally modify and/or permeate natural membranes, requires full elucidation to optimize biomedical properties or minimize health risks in consumer products. To get fundamental insight into these aspects, we used different model membrane systems, giant unilamellar vesicles (GUVs), supported lipid bilayers (SLB) and liposomes. The application of this approach was demonstrated in two case studies, where biomimetic membranes were challenged with:

a) A nanostructured antibiotic drug, composed of a bolaamphiphile and a transcription factor decoy, TFD, that self-assemble in solution to form NP (70 nm). The investigation with model bacterial membranes provided a sketch for a hypothetical mechanism of action: first they destabilize bacterial membranes and then, once internalized, the TFD is released and, in bacteria, it interferes with RNA transcription, inhibiting sporulation.

b) Gold NPs, of different size, shape and surface coating. Their effect on bilayer morphology, permeability and fluidity present strong differences or similarities, depending on the length scale, from the colloidal to the molecular domains. After a surface-energy driven adsorption, the NPs stiffen the region of contact and “freeze” the lipids in raft-like nanoscale domains.

In vitro experiments performed on E. Coli (a) and rat macrophages (b) challenged with the same NPs, indicate a close analogy with the observations in mimetic models, providing validation of our experimental approach.

Recent bibliography