Multivalency is the phenomenon that describes the interaction between multivalent receptors and multivalent ligands. It is well known to play a pivotal role in biochemistry, particularly in protein-carbohydrate interactions, both in solution (e.g. at pentavalent cholera toxins) and at interfaces (e.g. for the infection of cells by the attachment of viruses or bacteria to cell membranes). In particular in the latter case, multivalency is often poorly understood in a quantitative sense.

Supramolecular host-guest chemistry has been well established in solution, but its use at interfaces remains limited to for example sensor development for specific guest compounds. In order to build assemblies at surfaces through supramolecular interactions for nanotechnological applications, other demands have to be met, such as larger thermodynamic and kinetic stabilities of the assemblies. For many supramolecular motifs, this inevitably leads to the use of multivalent interactions.

A key point of the current presentation will be the transition area between slowly and rapidly exchanging multivalent interactions, and their influence on the dynamics and overall functioning of supramolecular systems, both in solution and on surfaces. It will be explained how this concept can lead to the design of artificial systems (see Figure) to study the interaction between influenza and a cell surface, which together provide a deeper understanding of this interaction.

References

La presenza della S. V. sarà molto gradita

Leonard Prins

Il Direttore del Dipartimento

Michele Maggini