



12th July 2012 – 15:00
Building 25f, Room 456

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Structure and energetics of carbohydrate-peptide complexes

Carbohydrates (or sugars) are a very important class of biomolecules. Besides their best-known role as energy source, they mediate molecular recognition processes by carrying information in the so-called “glyocode”. Owing to their high conformational flexibility, they can encode a very rich information exchanged by means of non-covalent interactions (mostly H bonding) with other biomolecular assemblies such as peptides, for example. Infrared (IR) spectroscopy is a sensitive probe of the interactions at play within molecules (intramolecular) or between a molecule and its surrounding partners (intermolecular). It provides experimental signatures of the conformational choices of the probed systems.

Double resonance IR-UV spectroscopy of complexes formed by a modified Phenylalanine – acting as a peptide model – and the anomers α and β of Galactose and Glucose have been observed. The first results suggest that the peptide acts as an anomeric sensor. While the structures of the complexes formed with different anomers of the monosaccharide are virtually the same, IR spectra reveal a substantial difference in the nature of the interaction.

These results will be discussed and an approach to access experimentally the binding energy of the complexes will be presented and illustrated in the case of the hydrated complexes of monosaccharides.

