Probing of Nanostructured Proteins with Biophysical Techniques

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Identification of dynamical and biophysical features of biological materials on the molecular/atomic level based on theories and methods of physics is crucial to solve cutting-edge biological problems. In the last decades, light-based technologies and optical/vibrational spectroscopic techniques such as infrared (IR) spectroscopic methodologies have been used much more frequently for the study of biological specimens (nano-structures, proteins, cells, body fluids, tissues etc.). The IR spectroscopy is regarded as a 'rejuvenated' technique since it allows rapid, sensitive, label-free and cost-effective detection of molecular interactions and perturbations without complex sample preparations, by probing the vibrational modes of molecules [1–4].

This talk focuses on the analysis of biological samples with multi-spectroscopic techniques and methodologies for unraveling dynamic processes, structural alterations and the order of events upon micro-environmental perturbations. Some of our recent studies conducted based on the interaction of light with deuterated/hydrated biosamples will be revealed, including nanostructured proteins, by using mid-IR spectroscopy combined with the 2D correlation spectroscopy and advanced IR-data analysis. The future perspectives will also be mentioned.

References:

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