LIGHT SCATTERING SPECTROSCOPY CHARACTERIZATION OF PROTEINS AND SUPRAMOLECULAR SYSTEMS

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Dynamic light scattering (DLS) provides information on the dynamical properties of a scattering macromolecules or supramolecular aggregates on the micro-second time scale. Additionally, an electric field can be applied to the solution, inducing a directed movement superimposed on the Brownian motion. This yields the zeta potential of the scattering particle, assessing its surface charge. The potentialities of these techniques are exemplified with studies on the structural characterization of two proteins (human fibrinogen and hemoglobin of *Glossoscolex paulistus*, HbGp) and on the interaction of rBPI$_{21}$ (a drug for meningococcal sepsis, in phase III clinical trials) with lipopolysaccharide (LPS) supramolecular aggregates. Non-invasive back scatter (NIBS) measurements allowed the study of the kinetics of HbGp alkaline dissociation, based on the derivation of a new model to obtain rate constants, and the evaluation dissociation and denaturation contributions on protein melting curves. The presence of rBPI$_{21}$ leads to a progressive increase of the hydrodynamic diameter and scattering intensities of the LPS aggregates, culminating with their aggregation and precipitation. rBPI$_{21}$ changes the surface charge of the LPS aggregates, increasing the zeta-potential value from -24 to +6 mV, demonstrating the electrostatic nature of the initial interaction between the peptide and LPS.