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The Bulk Association Mechanism between Lysozyme and alpha-Lactalbumine Is Revealed by Interfacial Measurements

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Controlled interactions and assembly of proteins with one another promise to be a powerful approach for generating novel supramolecular architectures. In this study, we report on two oppositely charged proteins, Lysozyme (LYS) and alpha-Lactalbumine (ALA) which self-assemble into well-defined micrometer-sized spherical particles under specific physicochemical conditions. These particles are spontaneously built following two main steps: first the formation of oligomers constituting the elementary pieces of the final assembly, second the growth of the particles by assembly of these oligomers (1-3). We hypothesized that the adsorption steps at the air water interface would reflect the assembly mechanism leading to the micro-spheres.

To test this hypothesis, we have recorded adsorption kinetics at the air-water interface, of LYS and ALA in conditions where microspheres were formed and in conditions where microspheres could not grow up (i.e. at high ionic strength). Our results show that the adsorption of the mixture LYS-ALA at the air-water interface is governed by the same rules that govern the first steps of formation of micro-spheres.

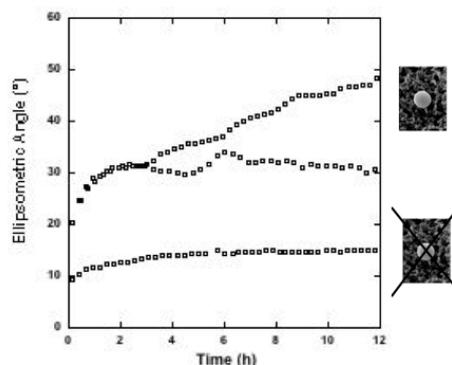


Fig. 1: In condition of formation of micro-spheres, the mixture LYS-ALA forms multilayers at the air-water interface. At high ionic force, micro-spheres does not grow and the mixture LYS-ALA forms a monolayer at the air-water interface

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