On the adsorption of magnetite nanoparticles on lysozyme amyloid fibrils

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An adsorption of magnetic nanoparticles (MNP) from aqueous ferrofluids on amyloid fibrils of hen egg white lysozyme (HEWL) in 2 mg/mL acidic dispersions have been detected for three different MNP concentrations. The mixture of the MNP with amyloid fibrils has been characterized by transmission electron microscopy (TEM), small-angle X-ray scattering (SAXS) and magneto-optical measurements. It has been observed that the scope of adsorption is determined by the MNP concentration. With increasing the MNP concentration, the aggregates of magnetic particles are formed and they repeat the general rod-like structure of the fibrils. The observed phenomenon is also discussed with respect to potential applications for ordering lysozyme amyloid fibrils in a liquid crystal phase under external magnetic fields.

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