AMYLOID-LIKE FIBER FORMATION DRIVEN BY LIPID-PROTEIN INTERACTION

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Electrostatic interactions between negatively charged membranes and basic peptides/protein domains have been implicated as the driving force for several important processes, often involving membrane aggregation, fusion or phase separation. Recently, acidic lipids were reported to both catalyze amyloid fiber formation by amyloidogenic proteins/peptides and induce formation of "amyloid-like" fibrils by nonamyloidogenic proteins. This study aims to characterize the structure of the aggregates of a basic protein (lysozyme) and negatively charged membranes (1-palmitoyl,2-oleoyl-*sn*-glycerophosphocholine/ 1-palmitoyl,2-oleoyl-*sn*-glycerophosphoserine 4:1 mixture) at the molecular level, using Förster Resonance Energy Transfer. It is concluded that lysozyme induced formation of a "pinched lamellar" structure, with reduced interbilayer distance in the regions where there is bound protein, and increased interbilayer distance (stabilized by hydration repulsion) outside these areas.

Key Words: amyloid, fluorescence, lipid-protein interaction