

SELF-ASSEMBLY OF THE PEPTIDE A₁₀K – INTERMEDIATE STATE IN AGGREGATE FORMATION

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We have studied the synthetic surfactant-like peptide A₁₀K in solution. Upon mixing the freeze dried, essentially amorphous peptide powder in heavy water, the peptides self-assemble into long ribbon-like aggregates with a fixed cross section of circa 3x8 nm. It is still unclear whether this self-assembly is equilibrium like a surfactant micelle formation or whether it corresponds to a precipitation of a solid phase. Through light scattering measurements on dilution series, the solubility of the ribbons has been determined to 4.7 μM. However, quantitative NMR spectroscopy shows a monomer concentration of 3 mM, corresponding to a roughly 60 times supersaturation, and independent of the total concentration. Samples prepared directly at, or below this specific concentration shows no, or only minor signs of aggregation. In combination with a broad peak in high resolution ¹H NMR spectroscopy we conclude that the formation of the A₁₀K aggregates occurs through an intermediate state in equilibrium with the peptide monomers.

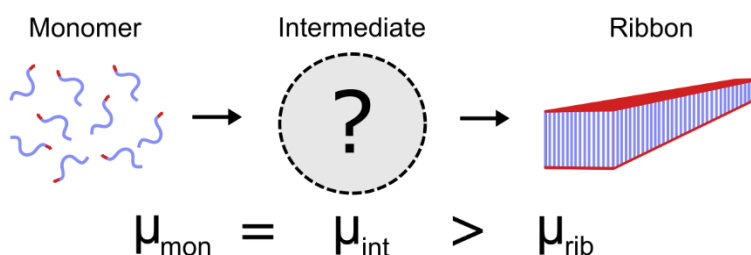


Figure 1 - Proposed pathway of aggregation for A₁₀K, through an intermediate state in equilibrium with the peptide monomers.