

Directing the self assembly of functionalized protein based materials

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When heated in aqueous acid, the protein insulin self-assembles into nano-wire structures known as amyloid fibrils. We recently discovered a novel method of preparing amyloid fibrils functionalized by hydrophobic molecules^{1,2}. We have now extended the procedure to include several different functionalizing guest compounds, thus enabling the creation of numerous hybrid materials with distinctly varying properties. The effects of incorporation on the guest compounds as well as the influence of the guest molecules on the morphology of the amyloid nanostructures have been a main focus of study and yielded several interesting results. Most notable, a significant size increase of protein spherulite structures into 1,5 μ m spheres and distinct changes in the emission properties of the incorporated compounds has been achieved. Thus we have demonstrated a way to direct the assembly process of small molecules into well defined macroscopic structures.

- 1, Preparation of Phosphorescent Amyloid-like Protein Fibrils. Rizzo, A.; Inganäs, O.; Solin, N. *Chem.—Eur. J.* 2010, 16, 4190
- 2, White Light with Phosphorescent Protein Fibrils in OLEDs. Rizzo, A.; Solin, N.; Lindgren, L.J.; Andersson, M.R.; Inganäs O. *Nano Lett.*, 2010, 10 (6), pp 2225–2230