NANOSCIENCE COLLOQUIUM

Thursday December 4th 2014 at 15:15, K-space, Fysicum

Mechanism of amyloid fibril growth and the effect of nanoparticles

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Experimental studies of amyloid fibril growth kinetics have been characterized by a large spread between replicates despite samples typically contain so many molecules that stochastic behaviour cannot be expected. We have therefore spent considerable effort to eliminate sources of inhomogeneity and reached a level of reproducibility between identical samples and between experiments on separate occasions that we can now collect data that lead to mechanistic insights into the aggregation process *per se*, and into the mechanism of action of inhibitors and nanoparticles. Data will be shown for the Alzheimer-associated peptide, Aβ42 aggregation, and the influence of physical parameters like peptide concentration, shear and ionic strength, as well as the effect of inhibitory proteins, model membranes and the effects of sequence variations. Monte Carlo simulations of amyloid formation from model peptides corroborate the finding from experiments and underscore that the very high level of predictability and reproducibility comes from multiple parallel processes. The approach is now at the stage where it will be meaningful to address in detail the mechanistic influence of nanoparticles, nanowires and other surfaces, which have been found to have a profound effect on the aggregation rate.

Host: Anders Mikkelsen (Synchrotron Radiation Research)

This is one in a regular series of Nanoscience Colloquia, aimed at all researchers and students with an interest in nanoscience. The series is arranged by the Strategic Research Environment "The Nanometer Structure Consortium at Lund University" (nmC@LU) and by the Linnaeus environment "Nanoscience and Quantum Engineering", funded by the Swedish Research Council (VR).

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