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VABILO NA PREGLOV KOLOKVIJ / INVITATION TO THE PREGL COLLOQUIUM

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Torek / Tuesday 12. 05. 2015, ob / at 13:00

Velika predavalnica Kemijskega inštituta / Lecture Hall at the National Institute of Chemistry; Hajdrihova 19, Ljubljana

Designability of Peptide-Based Materials

Structurally defined materials on the nanometer length-scale have been historically the most challenging to rationally construct and the most difficult to structurally analyze. Sequence-specific biomolecules, i.e., proteins and nucleic acids, have advantages as design elements for construction of these types of nano-scale materials in that correlations can be drawn between sequence and higher order structure, potentially affording ordered assemblies in which functional properties can be controlled through the progression of structural hierarchy encoded at the molecular level. However, the predictable design of self-assembled structures requires precise structural control of the interfaces between peptide subunits (protomers). In contrast to the robustness of protein tertiary structure, quaternary structure has been postulated to be labile with respect to mutagenesis of residues located at the protein-protein interface. We have employed simple self-assembling peptide systems to interrogate the concept of designability of interfaces within the structural context of nanotubes and nanosheets (see below). These peptide systems provide a framework for understanding how minor sequence changes in evolution can translate into very large changes in supramolecular structure, which provides significant evidence that the designability of protein interfaces is a critical consideration for control of supramolecular structure in self-assembling systems.

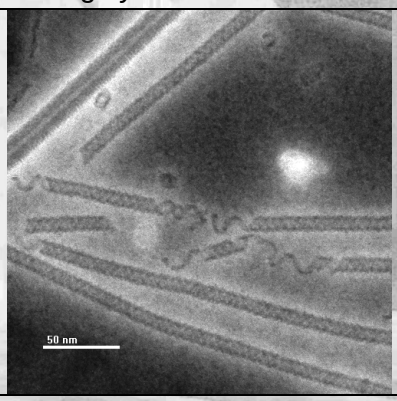

Figure 1. STEM image of nanotubes derived from self-assembly of a *de novo* designed, bi-faceted coiled-coil peptide.

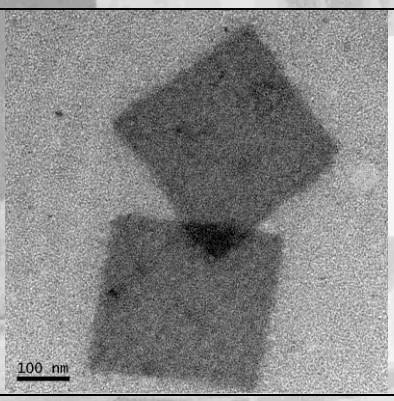

Figure 2. TEM image of two-dimensional nano-sheets derived from self-assembly of charge-complementary collagen peptides.

Vljudno vabljeni! / Kindly invited!

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