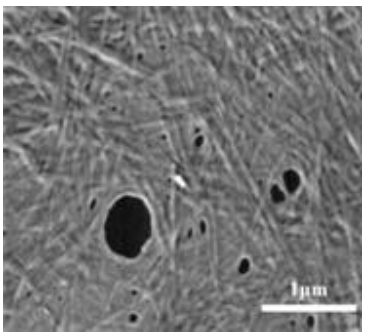
Supramolecular Polymers: Protein-based self-assembly systems directed at interfaces

André Zamith Cardoso

Microstructure Group, Leibnitz Institute of Polymer Research, Dresden,



Liquid marbles made from lycopodium clavatum spores are used to encapsu- late aqueous solutions of 9-fluorenylmethoxycarbonyl-diphenylalanine (Fmoc- FF). Acidification of the Fmoc-FF solution at the liquid/air interface of the liquid marble triggers the self-assembly of ribbon-like peptide fibrils into an ultrathin peptide membrane (50-500nm). The membrane incorporates the lycopodium microparticles and as a result stabilizes the liquid marble against collapse, that could otherwise occur through particle desintegration at the floating interphase.

Ultrathin nanostructured peptide membrane formation at the liquid/air interface is also observed within artificial microstructured floating objects. Thus, peptide membranes formed were inspected by SEM and TEM. Electron diffraction data reveal information about the molecular organization inside the oligopeptide membranes.

Keywords: Liquid marbles, peptide gels, microreactor, interface bottom-up design, lycopodium clavatum spores, electron diffraction, micro-to-nano hierarchical self-assembly, supramolecular biochemistry.

Accepted at Colloids and Surfaces B: Biointerfaces