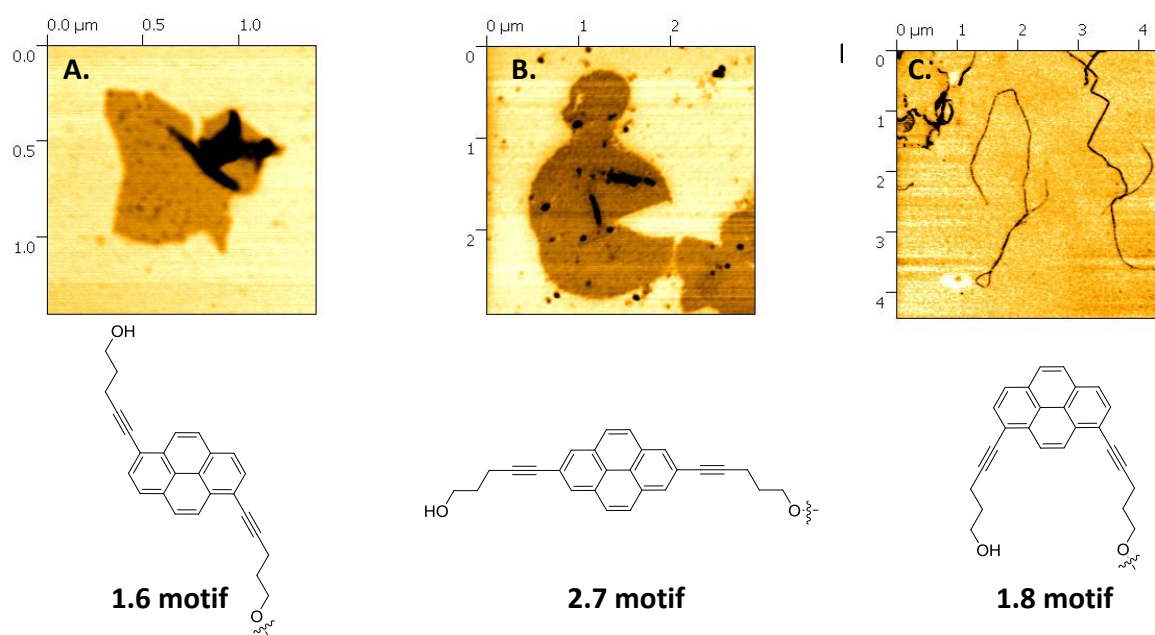


# Diversity of morphological patterns in supramolecular polymers formed from the amphiphilic oligomers of pyrenes

Vybornyi M., Häner R

Department for Chemistry and Biochemistry, University of Bern, Freiestrasse 3, Bern CH3012, Switzerland  
[mykhailo.vybornyi@dcb.unibe.ch](mailto:mykhailo.vybornyi@dcb.unibe.ch)

Herein we demonstrate that a substitution type of the pyrene in short amphiphilic oligomers determines a morphology of the assemblies formed. Thus, 1.6- and 2.7-linkages lead to a formation of micrometer-sized 2D supromolecular polymers with a constant thickness 2 nm (pictures A and B)<sup>1</sup>. These assemblies possess a high degree of an internal order: the interior consists of hydrophobic pyrenes and alkyl chains, whereas the exterior exists as a net of hydrophilic negatively charged phosphates. Contrary, a 1.8-linkage exclusively leads to a formation of long nanometer thick helical supramolecular polymers (picture C)<sup>2</sup>. These structures tend to form even more complex assemblies (bundles, superhelices). Moreover, for all samples the polymerization process occurs via a nucleation-elongation mechanism. To study Py<sub>3</sub> self-assembly, we carried out whole set of spectroscopic (UV/vis, fluorescence, DLS) and microscopic experiments (AFM).



<sup>1</sup> Vybornyi, M., Rudnev, A., Langenegger, S.M., Wandlowski, T., Calzaferri, G. and Häner, R., *Angew. Chem. Int. Ed.*, **2013**, 52, 11488–11493

<sup>2</sup> Nussbaumer, A. L., Studer, D., Malinovskii, V. L. and Häner, R., *Angew. Chem. Int. Ed.*, **2011**, 50: 5490–5494.