Supramolecular Assembly of Pyrene-DNA Conjugates into Columnar Vesicles

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The arrangement of structural subunits plays a crucial role in the shape of both natural and artificial supramolecular assemblies. In DNA nanotechnology, the well-defined DNA framework is utilized to achieve the spatial organization of functional groups.[1] In previous work DNA was modified with phenanthrene sticky ends forming vesicular supramolecular assemblies with light-harvesting properties[2] and *E*-tetraphenylethylenes modifications forming aggregation-induced emission active assemblies.[3-4] In this work, we modified two complementary DNA strands with 1,6-dialkynyl-pyrenes at the 3'-end (Figure 1a). Cryo-EM were performed after self-assembly revealing columnar vesicles (Figure 1b). In addition, the self-assembly was analyzed and discussed with fluorescence spectroscopy, UV-vis spectroscopy, and AFM.

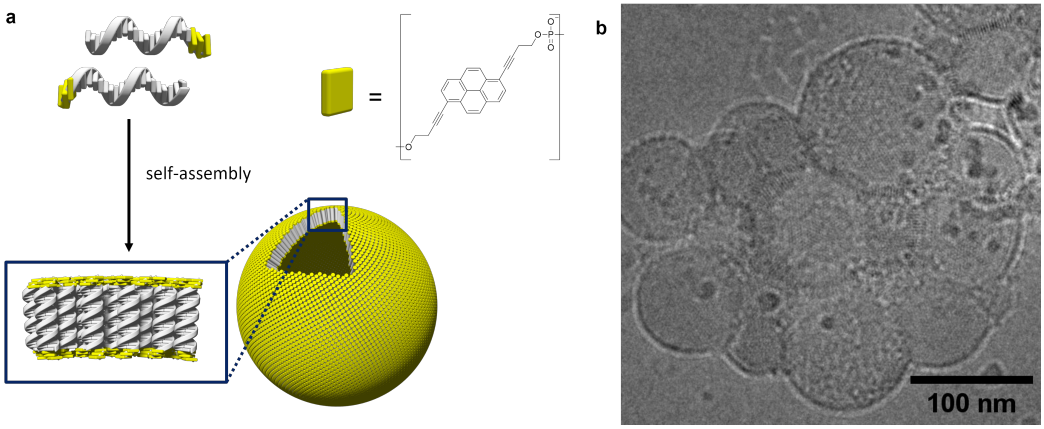


Figure 1 (a) Schematic representation of the self-assembled vesicles formed from 1,6-dialkynyl-pyrene-modified single strands and chemical structure of the pyrene-modification. (b) Cryo-EM image of vesicular assemblies.

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[4] Simon Rothenbühler, Ioan Iacovache, Simon M. Langenegger, Benoît Zuber, Robert Häner, *Bioconjugate Chem.* **2023**, 34, 70-77.