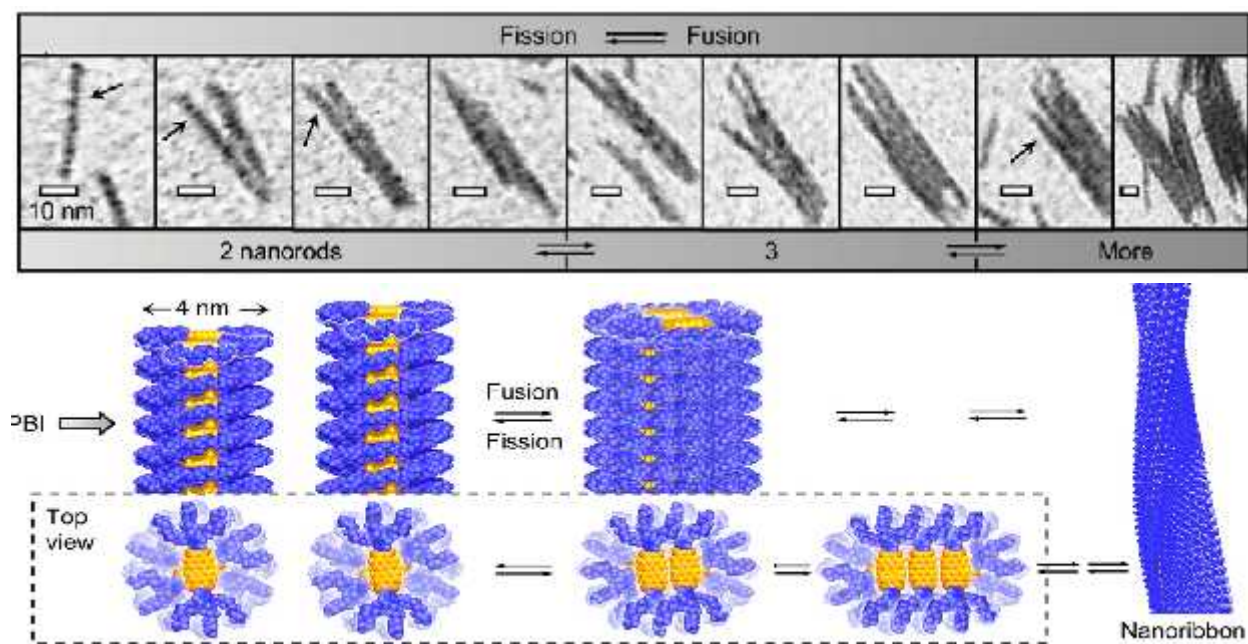


Self-assembly of Perylene Dyes in Water and Interactions with DNA and RNA

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Perylene bisimide (PBI) dyes are probably the most utilized class of colorants and functional dyes in the field of supramolecular dye chemistry [1]. The design of PBI aggregates in water has, however, remained challenging because the hydrophobic effect enhances the binding constant to such an extent that growth into large-sized aggregates is hard to prevent and kinetic self-assembly pathways become unavoidable [2]. In this talk I will discuss our work on the design of micelles and vesicles according to Israelachvili packing parameters [3], construction of pH sensitive vesicles and white light emitting micelles [4,5], and more recent work on PBI bolaamphiphiles equipped with ammonium groups which show strong interaction with polynucleotides [6]. Finally most recent work on fusion of PBI nanorods into lamellae (see Figure)[7], the kinetic self-assembly of supramolecular block co-polymers [8], LCST behavior and intriguing insights into the thermodynamics of PBI self-assembly will be reported as well.



References:

1. F. Würthner, *Chem. Commun.* **2004**, 1564–1579.
2. D. Görl, X. Zhang, F. Würthner, *Angew. Chem. Int. Ed.* **2012**, *51*, 6328–6348.
3. X. Zhang, Z. Chen, F. Würthner, *J. Am. Chem. Soc.* **2007**, *129*, 4886–4887.
4. X. Zhang, S. Rehm, M. M. Safont-Sempere, F. Würthner, *Nature Chem.* **2009**, *1*, 623–629.
5. X. Zhang, D. Görl, F. Würthner, *Chem. Commun.* **2013**, *49*, 8178–8180.
6. J. Gershberg, M. Radic Stojkovic, M. Skugor, S. Tomic, T. H. Rehm, S. Rehm, C. R. Saha-Möller, I. Piantanida, F. Würthner, *Chem. Eur. J.* **2015**, DOI: 10.1002/chem.201500184
7. X. Zhang, D. Görl, V. Stepanenko, F. Würthner, *Angew. Chem. Int. Ed.* **2014**, *53*, 1270–1274.
8. D. Görl, X. Zhang, V. Stepanenko, F. Würthner, *Nature Commun.* **2015**, DOI: 10.1038/ncomms8009