

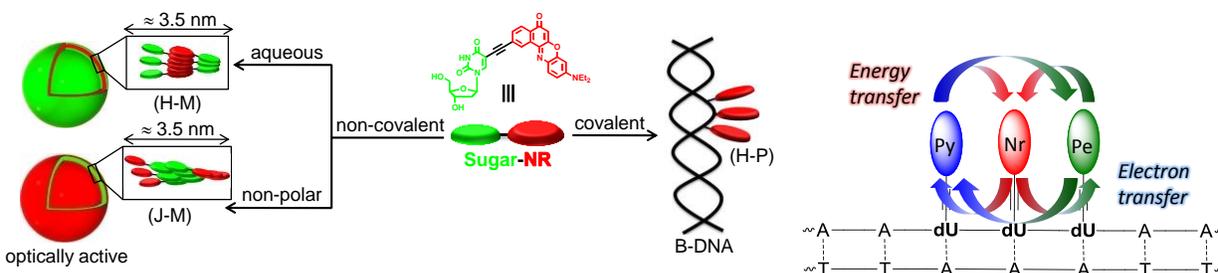
DNA-based chromophore assemblies

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The supramolecular organization of organic chromophores is the key for the successful bottom-up approach of nanosized materials with defined optical properties, especially in water. The architecture of double-helical DNA plays a growing role in this field since it allows organizing chromophores in a precise way. Thereby the primary stacking interactions and chirality of a variety of different chromophores can be controlled. In the covalent approach, this was achieved by organic chromophores as artificial DNA building blocks either for DNA base replacements or for DNA base modifications. In the latter case, mainly pyrenes, perylenes and nile reds were attached covalently to DNA bases via short and rigid ethynyl bridges, and combined for DNA-based light harvesting systems. However, the yields of solid-phase synthesis and the solubility set the limit for length and size of these multichromophore-DNA conjugates. On the other hand, single-stranded DNA can serve as a template for the non-covalent assembly of chromophores. The optical properties of a non-covalent DNA-templated assembly of ethynyl pyrenes can be compared to the stack of this chromophore as covalently linked DNA base modifications.



References

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