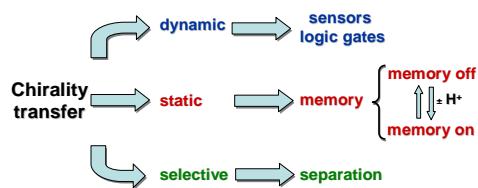


Chirality transfer for sensing, memory and separation

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The intriguing process of chirality transfer from organic or inorganic chiral templates to achiral porphyrins has been in the focus of our interests for more than a decade. Our studies on exploiting the electrostatic interactions as tools to build noncovalent aggregates were mainly carried out in aqueous solution (the “green” solvent). A designed combination of thermodynamic and kinetic control of the self-assembly process has allowed us to develop various applications all based on the induced chirality in the porphyrin Soret band absorption region (see Scheme 1).



Scheme 1

In the center of our discussion will be some interesting aspects related to chirality transfer and sensing, such as the memory of chirality and its cyclic (on-off) switch [1-4] as well as the process of going from Z-DNA chiroptical sensing to Z-DNA based logic gates [5,6]. In addition we will present some more recent results on a resolution of a racemate of enantiomeric J-aggregates formed from tetra-anionic porphyrins [7].

- [1] E. Bellacchio, R. Lauceri, S. Gurrieri, L. Monsù Scolaro, A. Romeo, R. Purrello, *J. Am. Chem. Soc.* **1998**, *120*, 12353.
- [2] R. Lauceri, A. Raudino, L. Monsù Scolaro, N. Micali, R. Purrello, *J. Am. Chem. Soc.* **2002**, *124*, 894.
- [3] A. Mammana, A. D'Urso, R. Lauceri, R. Purrello, *J. Am. Chem. Soc.* **2007**, *129*, 8062.
- [4] R. Randazzo, A. Mammana, A. D'Urso, R. Lauceri, R. Purrello, *Angew. Chem. Intern. Ed.* **2008**, *47*, 9879.
- [5] M. Balaz, M. De Napoli, A.E. Holmes, A. Mammana, K. Nakanishi, N. Berova, R. Purrello, *Angew. Chem. Intern. Ed.* **2005**, *44*, 4006.
- [6] A. D'Urso, A. Mammana, M. Balaz, A.E. Holmes, N. Berova, R. Lauceri, R. Purrello, *J. Am. Chem. Soc.* **2009**, *131*, 2046.
- [7] A. D'Urso, R. Randazzo, L. Lo Faro, R. Purrello, *Angew. Chem.* **2010**, *49*, 108.