Luminescent Pt(II) complexes and their assemblies

A. Aliprandi and L. De Cola*

Laboratoire de Chimie et des Biomatériaux Supramoléculaires
Institut de Science et d'Ingénierie Supramoléculaires (I.S.I.S.)
Université de Strasbourg, mailto: aliprandi@unistra.fr

Self-assembly is a ubiquitous and essential process in nature and the key for the creation of large, functional and dynamic systems.[1] It relies on the precise assembly of randomly oriented molecules into highly ordered supramolecular structures by means of delicate balance of weak non-covalent interactions. However the self-assembly process is not always under thermodynamic control and kinetic product may also form.[2] Kinetic pathways are of extremely importance and ubiquitous in nature. An example is the aberrant aggregation of proteins into amyloidal fibers which are responsible of many neuropathology such as Alzheimer and Parkinson diseases.[3] Unfortunately, kinetic pathways are often elusive, precluding deep and comprehensive control on the final structures. A way to "shine light" o self-assembly processes is to take advantage of probes which are able to change dynamically their emission colors upon aggregation. Luminescent square-planar Pt(II)-complexes are particularly suitable for that since, upon stacking, they can establish metallophilic interactions resulting in a change of their emission properties.[4] By monitoring the change in the emission colors it is possible not only to discriminate up to three different self-assembly pathways, but also to visualize, in real-time, the evolving self-assemblies.[5]

References

[1] J. M. Lehn, *Supramolecular Chemistry: Concepts and Perspectives*, VCH Weinheim, **1995**.
[2] a) P. a. Korevaar, S. J. George, *Nature* **2012**, *481*, 492-496; b) D. van der Zwaag, T. F. A. de Greef, *Angew. Chem. Int. Ed.* **2015**, *54*, 8334-8336.
[3] a) I. V. Baskakov, G. Legname, *J. Biol. Chem.* **2002**, *277*, 21140-21148; b) F. Chiti, C. M. Dobson, *Annu. Rev. Biochem* **2006**, *75*, 333-366.
[4] B. Ma, J. Li, *JACS* **2005**, *127*, 28-29.
[5] A. Aliprandi, M. Mauro, *Nat. Chem.* **2016**, *8*, 10-15.