

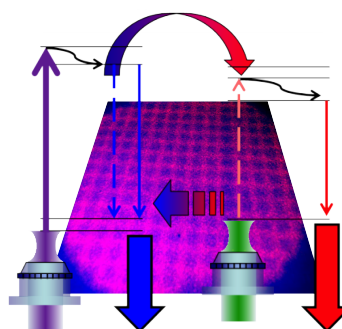
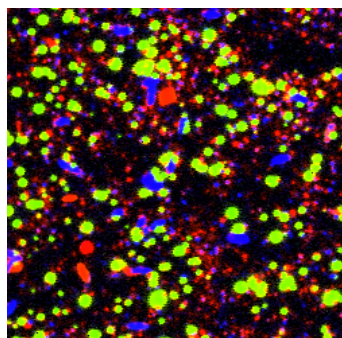
# Supramolecular control of electronic properties in organic materials

Dario M. Bassani

<sup>1</sup> *Inst. des Sciences Moléculaires, Univ. de Bordeaux,  
CNRS UMR5255, Talence, France*  
[dario.bassani@u-bordeaux.fr](mailto:dario.bassani@u-bordeaux.fr)

In recent years, the development of nanoscale molecular devices has emerged as a viable route to intelligent functional materials operating at the molecular level. For applications in organic electronics, the organization of photo- and electroactive moieties is a prerequisite. Such organization, which can be attained by making use of supramolecular interactions, can lead to materials exhibiting controlled electron and energy transfer processes. A major feature of the self-assembly process is that individual components will spontaneously combine in a predetermined fashion due to the presence of complementary molecular recognition sites. An advantage of supramolecular architectures is their ability to accommodate geometries not easily obtained by conventional synthesis, such as proximal arrangements of distant orthogonal units. This can lead to interesting photochemical and photophysical behavior, such as the observation of additional electronic interactions, or the control of excited-state processes.<sup>1-2</sup>

The use of hydrogen bonding is particularly interesting and has allowed us to tune the emission properties of self-assembled vesicle-like aggregates. These possess unique properties making them suitable to be incorporated into OLED devices possessing ultra-high resolution and in which the color of individual pixels can be controlled through energy transfer both during device preparation,<sup>3</sup> but also after through chromic bleaching of the acceptor component.<sup>4</sup>



Real color image (left, 40x40  $\mu\text{m}$ ) of self-assembled aggregates and example of chromic patterning with sub-micron resolution (right).

## References

1. *Chem. Soc. Rev.* **2014**, 43, 4179
2. *NPG Asia Mat.* **2014**, 6, e116.
3. *ACS Nano*, **2016**, 10, 998; *Macromolecules* **2013**, 46, 1591.
4. *ACS Appl. Mater. Interfaces* **2017**, 10.1021/acsami.7b06640.