

# Fashioning Functional Materials with Integrated Mechanostereochemical Systems

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Just as supramolecular chemistry may be defined as ‘*chemistry beyond the molecule*’ so mechanostereochemistry may be defined as ‘*chemistry beyond the supermolecule*’ related to robust mechanically interlocked components of precise form and predetermined function that result from the intramolecular forces between the matching components in mechanically interlocked molecules (MIMs). On the back of a historical introduction, the talk will promote the use of switchable MIMs in the functionalization of surfaces and nanoparticles—both metal and (mesoporous) silica—for potential applications in molecular electronic devices (MEDs) and nanoelectromechanical systems (NEMS). Preliminary investigations on the introduction of switchable MIMs into three-dimensional metal-organic frameworks (MOFs) will also be discussed.

## *Selected Literature*

- (1) Big and little Meccano, *Tetrahedron* **2008**, 64, 8231–8236.
- (2) Thither supramolecular chemistry? *Nature Chem.* **2009**, 1, 14–15.
- (3) The chemistry of the mechanical bond, *Chem. Soc. Rev.* **2009**, 38, 1802–1820.
- (4) Docking in metal-organic frameworks, *Science* **2009**, 325, 855–859.
- (5) Mechanised nanoparticles for drug delivery, *Nanoscale* **2009**, 1, 16–39.
- (6) Mechanically bonded macromolecules, *Chem. Soc. Rev.* **2010**, 39, 17–29.
- (7) Nanoparticles functionalised with reversible molecular and supramolecular switches, *Chem. Soc. Rev.* **2010**, 39, 2203–2237.
- (8) Robust dynamics, *Nature Chem.* **2010**, 2, 439–443.