

Taking advantage of the mechanical bond in two lessons:

1) Operating an artificial molecular transporter

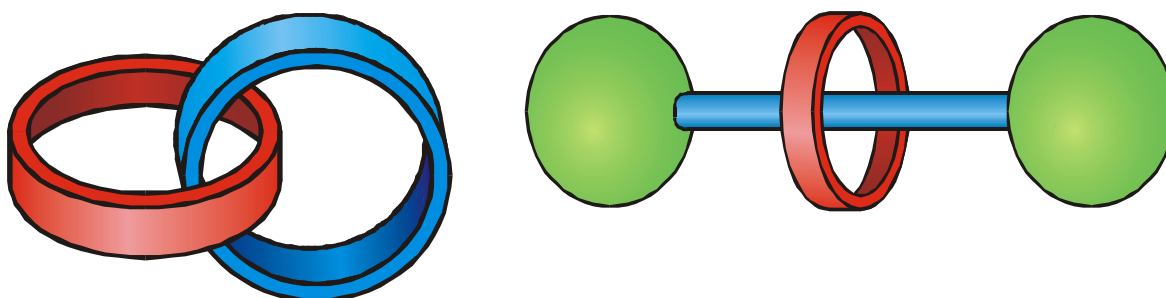
2) Remote electrochemical modulation of pKa

Benoit Colasson

Université Paris Descartes, Université de Paris, Laboratoire de Chimie et de Biochimie Pharmacologiques et Toxicologiques (CNRS UMR 8601), 45 rue des Saints-Pères, 75006 Paris, France.

Università di Bologna, Dipartimento di Chimica "G. Ciamician", via Selmi 2, 40126 Bologna, Italy.

The chemistry of catenanes and rotaxanes was first a chemical curiosity before the use of the mechanical bond spreads to many areas of research.¹ Mechanically interlocked compounds derived from switchable bistable [2]rotaxanes show great promise.² These systems can undergo dynamic, relative movements between their components, such as shuttling and circumrotation, enabling them to serve as stimuli-responsive switches. Yet, properties emanating exclusively from the presence of the mechanical bond are scarce. In this presentation, a first part will describe the design of a molecular transporter using a switchable rotaxane³ and a second topic will be devoted to the use of the mechanical bond as a messenger to thermodynamically couple two remote sites.^{4,5}



References

- [1] J. F. Stoddart, *Chem. Soc. Rev.*, **2009**, *38*, 1802-1820.
- [2] A. Coskun, M. Banaszak, R. D. Astumian, J. F. Stoddart, G. A. Grzybowski, *Chem. Soc. Rev.*, **2012**, *41*, 19-30.
- [3] C. Schäfer, G. Ragazzon, B. Colasson, M. La Rosa, S. Silvi, A. Credi, *Chemistry Open*, **2016**, *5*, 120-124.
- [4] G. Ragazzon, A. Credi, B. Colasson, *Chem. Eur. J.*, **2017**, *23*, 2149-2156.
- [5] G. Ragazzon, C. Schäfer, P. Franchi, S. Silvi, B. Colasson, M. Lucarini, A. Credi, *Proc. Natl. Acad. Sci. U.S.A.*, **2018**, *115*, 9385-9390.