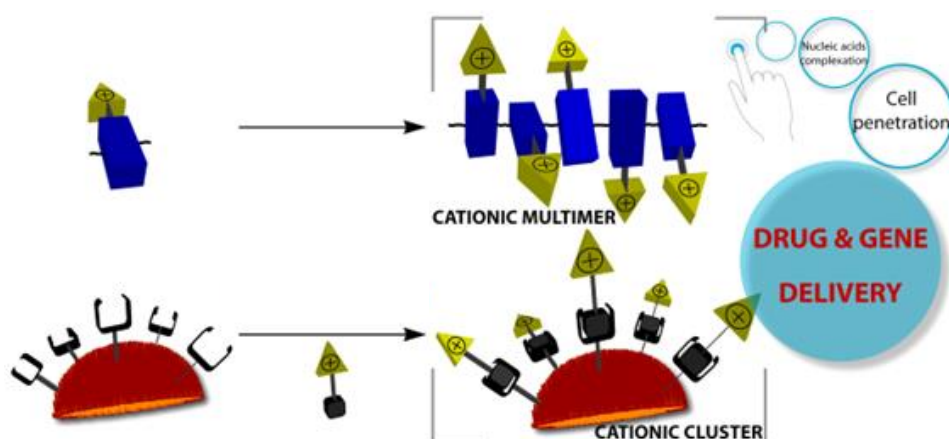


SMART BIORECOGNITION BY DYNAMIC COVALENT CHEMISTRY

Sébastien Ulrich

*Institut des Biomolécules Max Mousseron (IBMM), UMR 5247, Ecole Nationale Supérieure de Chimie de Montpellier (ENSCM), 8 rue de l'Ecole Normale, 34296 Montpellier Cedex 5 – France
e-mail: sebastien.ulrich@enscm.fr*

Dynamic covalent chemistry (DCC) has recently emerged as an innovative approach for the self-assembly of multicomponent biomolecular systems that display dynamic and adaptive features. Our group explores the particular implementation of DCC for i) the generation of smart recognition and delivery systems for drug and gene delivery applications, and for ii) the identification of addressable nano-cage sensors. In this talk, we will present three examples of dynamic materials (peptide-supported nanoconstructs, coordination clusters, biopolymers) that were generated through DCC and that dynamically express the multivalent binding of DNA/RNA. We will show that these systems are adaptive and responsive to physico-chemical stimuli, thereby opening new avenues for the generation of “smart” gene delivery vectors. We will disclose our latest results on the cellular delivery of siRNA. Finally, we will present our recent results on the generation of addressable nano-cages by DCC and discuss their potential in supramolecular recognition.



Key references

- W. Drożdż, C. Bouillon, C. Kotras, S. Richeter, M. Barboiu, S. Clément, A. R. Stefankiewicz, S. Ulrich, *Chem. Eur. J.*, **2017**, accepted for publication
- E. Bartolami, J. Knoops, Y. Bessin, M. Fossépré, J. Chamieh, P. Dumy, M. Surin, S. Ulrich, *Chem. Eur. J.*, **2017**, *23*, 14323-14331
- E. Bartolami, C. Bouillon, P. Dumy, S. Ulrich, *Chem. Commun.*, **2016**, *52*, 4257-4273
- E. Bartolami, Y. Bessin, N. Bettache, M. Gary-Bobo, M. Garcia, P. Dumy, S. Ulrich, *Org. Biomol. Chem.*, **2015**, *13*, 9427-9438
- E. Bartolami, Y. Bessin, V. Gervais, P. Dumy, S. Ulrich, *Angew. Chem. Int. Ed.*, **2015**, *54* (35), 10183-10187
- C. Bouillon, D. Paolantoni, J. C. Rote, Y. Bessin, L. W. Peterson, P. Dumy, S. Ulrich, *Chem. Eur. J.*, **2014**, *20* (45), 14705-14714
- S. Ulrich, P. Dumy, *Chem. Commun.*, **2014**, *50* (44), 5810-5825
- S. Ulrich, D. Boturyn, A. Marra, O. Renaudet, P. Dumy, *Chem. Eur. J.*, **2014**, *20* (1), 34-41