Nicolas Duchemin, Med chem 2016, 6:7(Suppl)
http://dx.doi.org/10.4172/2161-0444.C1.021

New developments in bio-hybrid mediated catalysis to a wider synthetic applicability of oligonucleotides as universal chiral scaffolds

Nicolas Duchemin
Noxxon Pharma AG, Germany

Bio-inspired asymmetric catalysis, using the inherent chirality of biomolecules in combination with a transition metal, became a very attractive synthetic tool. Among all these bio-inspired catalysts, oligonucleotides stand out, taking profit of the powerful chirality imposed by the double helix of DNA or RNA and the strong ligation possible with a wide range of metallic co-factors. The concept of DNA-based hybrid catalysis was first introduced in Cu(II)-catalysed reactions and immediately led to the development of other asymmetric C C and C-heteroatom bond forming reactions. Our group has recently been interested in the development of DNA-based asymmetric catalysis trying to unveil new synthetic applications. We therefore first developed the use of non-natural left handed L-DNA as a universal tool to control the stereoselective outcome of any reaction and also took interest in merging DNA-hybrid catalysis with heterogeneous catalysis using cellulose-supported oligonucleotides. We further continued our quest of synthetic applicability in developing new oligonucleotide-conjugates as multivalent chiral platform showing unprecedented catalytic activity in known reactions. Also, aiming at a deeper understanding of the chirality transfer occurring between and oligonucleotide catalyst and a substrate, we developed new minor groove binding ligands Hoechst 33258 derivatives for the development of sequence-specific catalysis and also turned our attention on the use of RNA as alternative chiral scaffold for asymmetric catalysis.

Biography

Nicolas Duchemin has completed his Master's thesis at ESPCI ParisTech, under the supervision of Stellios Arseniyadis, Pr. Michael Smietana and Pr. Janine Cossy. For his pre-PhD programm, he joined a Berlin based biotech company, Noxxon Pharma AG. His most recent publications are: *Chem. Commun., 2015, 51, 6076–6079; ACS Catal., 2016, 6 (5), 3096–3105 and; Chem. Commun., 2016*.

nduchemi@ens-cachan.fr

Notes: