

Engineering transglycosidases for oligosaccharide synthesis: from random to rational approaches.



Charles TELLIER
UMR-CNRS UFIP, Université de Nantes, FRANCE

The important role of oligosaccharides and their conjugates in biology has been increasingly recognized in recent years. Unfortunately, despite the considerable development of efficient synthetic methods in this field, the assembly of oligosaccharides remains a substantial challenge. As an alternative, enzymatic glycosylation has become a powerful tool for stereoselective synthesis of various glycosidic compounds. Several engineering strategies based either on the directed evolution of glycosidases into transglycosidases using an original screening strategy, or on rational mechanism engineering will be presented. The resulted enzymes have almost completely lost their hydrolytic activity while keeping efficient transglycosidase activity. These new transglycosidases can compete with glycosyltransferases for oligosaccharide synthesis.

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