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Hexofuranosides, chemistry and biocatalysis: From UDP-Galf to anti-adhesive surface

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Hexoses are sometimes present in nature in the form of furanose. Absent in mammals, they are however biosynthesized by microorganisms, some of which being pathogenic. This is the case of *Mycobacterium tuberculosis*, *Leishmania*, *Trypanosoma*, *Aspergillus*, etc. Moreover, it was shown that polygalactofuranosides are able to stimulate the mammalian immune system. In this context, our team has developed chemical synthesis of complex nucleotide-furanoses, natural (D-Gal, D-Fuc series) and non-natural ones (fluorinated mimetics) in order to disrupt biochemical pathways. More recently, we have established that more available furanolipids (but not the pyranosidic counterparts) are suitable anti-parasitic agents able to fight mycobacteria and *Leishmania* spp. These results led us to develop two different axis still related to the synthesis and the properties of furanosyl-containing conjugates. On the basis of the biological potential of such derivatives, we have investigated the properties of materials and surfaces characterized by the presence of hexofuranosides. Examples of bacteriostatic biopolymers and anti-adhesive glasses will be described. Finally, new biocatalysts were also produced for synthetic purposes, mutated and selected to increase regioselective glycosylation of mannopyranosides, or to increase affinity for Galf residue. Original glycosylation ability and optimized recognition will also be presented.

Biography

Vincent Ferrieres has completed his PhD from Rennes 1 University (1994) and two Post-doctorates from Konstanz University and Medicine University of Paris. He is now a Full Professor at the National Graduate School of Chemistry, Rennes (ENSCR, 2005) and responsible for the team Organic Chemistry and Interfaces (CORInt) of the Rennes Chemical Sciences Institute (ISCR). He is the Co-Author of more than 80 publications and book chapters, and also Co-Author of eight patents. This research area is being developed in strong collaboration with Laurent LEGENTIL, Caroline NUGIER-CHAUVIN, Sylvain TRANCHIMAND, and Loïc LEMIEGRE.

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