

DSM Science & Technology Awards (SOUTH) 2009	
Name	Christiane Goedl
University	Technische Universität Graz
Department	Biotechnologie und Bioprozesstechnik
PhD Supervisor	Prof. Bernd Nidetzky

Glycosyltransferases are key enzymes for biosynthesis in glycobiology. They are widely distributed in known genomes, typically accounting for about 1 – 2% of all gene products. The catalytic function of glycosyltransferases is utilization of an activated donor sugar substrate to bring about glycosidic bond formation in glycans, glycoconjugates and a wide variety of sugar-containing small biomolecules. Exquisite selectivity is a hallmark of glycosyltransferase action, and elucidation of the underlying principles of structure and function presents a major challenge in this post-genomic era. Sugar transfer proceeds with either inversion or retention of the configuration at the anomeric carbon of the donor substrate in the product, and each stereochemical course necessitates a distinct catalytic mechanism. The molecular understanding thereof can be exploited for the biocatalytic synthesis of new glycosides as reported for the production of a natural stereochemically pure osmolyte, 2-O-(α -D-glucopyranosyl)-*sn*-glycerol. Furthermore, mechanistic comparison of a pair of disaccharide phosphorylases has provided relevant insights into the molecular mechanism of retaining sugar transfer, which has remained elusive so far.