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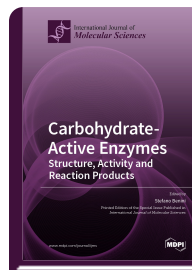
Carbohydrate-Active Enzymes

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Carbohydrate-active enzymes are responsible for both biosynthesis and the breakdown of carbohydrates and glycoconjugates. They are involved in many metabolic pathways; in the biosynthesis and degradation of various biomolecules, such as bacterial exopolysaccharides, starch, cellulose and lignin; and in the glycosylation of proteins and lipids. Carbohydrate-active enzymes are classified into glycoside hydrolases, glycosyltransferases, polysaccharide lyases, carbohydrate esterases, and enzymes with auxiliary activities (CAZy database, www.cazy.org). Glycosyltransferases synthesize a huge variety of complex carbohydrates with different degrees of polymerization, moieties and branching. On the other hand, complex carbohydrate breakdown is carried out by glycoside hydrolases, polysaccharide lyases and carbohydrate esterases. Their interesting reactions have attracted the attention of researchers across scientific fields, ranging from basic research to biotechnology. Interest in carbohydrate-active enzymes is due not only to their ability to build and degrade biopolymers—which is highly relevant in biotechnology—but also because they are involved in bacterial biofilm formation, and in glycosylation of proteins and lipids, with important health implications. This book gathers new research results and reviews to broaden our understanding of carbohydrate-active enzymes, their mutants and their reaction products at the molecular level.



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