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The carbohydrate-active enzymes of digestive microbiomes

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Carbohydrate-active enzymes are the enzymes that build and break down glycoconjugates, oligo- and polysaccharides. Because the structural variety of carbohydrate structures exceeds that of protein folds, it is difficult to predict accurately the specificity of carbohydrate-active enzymes from sequence alone. We have build the carbohydrate-active enzymes database (www.cazy.org) over 12 years ago in order to facilitate genome mining for these enzymes. The survey of hundreds of genomes shows that the human genome encodes a tiny number of enzymes for the breakdown of the complex food carbohydrates. In contrast the bacteria of our gut microflora encode a multitude of these enzymes. This conference will review how genomic and metagenomic sequencing allows an unprecedented view of the extent of the carbohydrate digestive repertoires of humans and animals.