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Aroma glucoside production

Objectives: Flavor is the sensory impression of a food and is determined mainly by the chemical senses of smell and taste. In plant derived food, a large fraction of the volatile compounds that may impart aroma (smell) are also present as non-volatile aroma glycosides. They have attracted much attention as antimicrobials and detergents but also as flavor precursors and taste modifiers. The glycosides are either extracted from plant materials or are synthesized by chemical and biocatalytic methods. Up to now, biotechnological production of aroma glycosides is based mainly on reversed hydrolysis performed by glycosidases or transglycosidases. However, these methods suffer from low yields and the excess of the starting materials.

Results: Recently, we succeeded in the cloning and characterization of the first UDP-glucose: Flavor alcoholβ-D-glucosyltransferase (GT) genes from different plants. Heterologous expression in *Escherichia coli* yielded promiscuous GT enzymes that efficiently produced glucosylate primary monoterpenols, simple alcohols and phenols. The GT enzymes differ in substrate preference and activity towards their terpenoid substrates. Site specific mutagenesis identified amino acids essential for activity and substrate tolerance.

Conclusion: Biotransformation experiments confirmed the applicability of the novel GTs in biocatalytic processes for the production of aroma glucosides. In the near future, aroma glucosides become available and will find broad applications in food, cosmetic and pharmaceutical industry as antimicrobials, detergents, flavor precursors and taste modifiers.

Biography

Wilfried Schwab studied Food Chemistry at the University of Würzburg and did his Doctorate in 1989. Following a Postdoctoral stay at Washington State University, he spent three years working in Hoechst AG's Agriculture Division. He returned to the University of Würzburg to complete his Lecturer Qualification in 1999. He worked in research after that, notably at Plant Research International in Wageningen, the Netherlands and the Spanish National Research Council (CSIC) in Seville, Spain. In 2003, he accepted a position at TUM. He is a Member of the BfR Committee for Genetically Modified Food and Feed.

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