

DSM Science & Technology Awards (NORTH) 2009	
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In my PhD-thesis I developed an enzymatic toolbox for the preparation of optically pure tertiary alcohols. These important building blocks in organic synthesis are difficult to obtain by chemical methods, which makes biocatalysis an attractive and sustainable alternative for their preparation. The biocatalytic synthesis of tertiary alcohols, however, is still a challenge as only few enzymes accept them as substrates and enantioselectivity is usually very low.

The design of several enzyme variants with excellent enantioselectivity in the conversion of tertiary alcohols by means of directed evolution provided new catalysts for these difficult substrates and gave valuable insights into the molecular basis of enantiodiscrimination in biocatalysis. To complement the protein design approach, novel selective biocatalysts were identified from metagenome-derived enzyme collections. In future, these enzymes will provide a catalytic toolbox for the highly selective and environmentally benign synthesis of tertiary alcohols.