

Enzyme Discovery and Engineering for Sustainable Applications in Biocatalysis

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This lecture will cover recent achievements in the discovery, protein engineering and application of enzymes in biocatalysis [1].

Examples include the asymmetric synthesis of chiral amines using a sophisticated growth selection method. Thus highly active and selective enzymes from three classes were improved to make important chiral precursors [2].

For the conversion of complex polysaccharides from marine algae, we discovered a new class of P450 monooxygenases from marine bacteria for the demethylation of porphyrin [3]. We identified the entire degradation pathway of the complex algal carbohydrate ulvan involving >13 different enzymes [4].

For the recycling of PET, we have improved different esterases [5] and also established a protocol for a fair comparison of PETases reported in literature [6]. We also have identified the first urethanases in a metagenomic library able to degrade polyurethanes [7] and designed an enzyme cascade to degrade poly(vinylalcohols) [8].

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