

P016 Biocatalytic Production of Chiral Building Blocks Using Novel Alcohol Dehydrogenases and Hydroxynitrile Lyases
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Biocatalytic processes are becoming increasingly useful for the production of chiral intermediates. Alcohol dehydrogenases (ADHs) can be applied to the synthesis of a wide range of chiral building blocks from ketones. Screening for ADH activity from many microorganisms & subsequent genome investigation has led to the generation of a versatile enzyme toolbox for efficient bioconversions. This toolbox enables the production of various enantiopure alcohols, eg, ketones can be reduced by ADH LB from *Lactobacillus brevis* or ADH T from *Thermoanaerobacter* sp. with good yields and excellent enantiomeric selectivity (ee > 99 %). Asymmetric addition of hydrogen cyanide to aldehydes or ketones catalysed by hydroxynitrile lyases (HNLs) is a complementary approach to chiral compounds, involving an asymmetric addition of hydrogen cyanide to aldehydes and ketones. While (*R*)-HNL can be obtained in large amounts directly from natural sources, isolation of (*S*)-HNLs has been difficult, because cell concentration of these enzymes is much lower. Though intensive investigations have been carried out, overexpression rates for most (*S*)-selective HNLs remained poor. Recently, Jülich Fine Chemicals succeeded in the construction of a recombinant *E. coli* system which allows the large scale production of (*S*)-HNL from *Manihot esculenta* (10,000 L scale; several Giga-units of enzyme activity).