Pichia glucozyma: a powerful biocatalyst for enantioselective reduction of ketones

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The asymmetric reduction of prochiral ketones using isolated or cell-bound ketoreductases is a well-recognised method for the preparation of chiral alcohols. The major drawback encountered with enzymatic reduction using isolated enzymes is the necessity for cofactor recycling, which can be circumvented by two-enzyme or one-enzyme recycling methodologies. Whole cells exhibit as a major advantage that cofactors are already present and can be intrinsically recycled *via* the oxidation of a second substrate. Beside the easily available *Saccharomyces cerevisiae*, other microbial species have been widely employed for asymmetric reductions or more generally as sources for new selective ketoreductases, since there is still a need for new biocatalysts able to perform stereoselective reductions with different or ameliorated chemo-, regio- and stereoselectivity. Non-conventional yeasts are plentiful sources of different carbonyl reductases and during our past works on enantioselective carbonyl reduction we have found that whole cells of the yeast *Pichia glucozyma* CBS 5766 (now reclassified as *Ogataea glucozyma*) catalysed the stereoselective reduction of different ketones, often showing remarkable results in terms of activity and stereoselectivity. In this work, we have studied the potential of whole cells of *Pichia glucozyma* CBS 5766 for the reduction of various ketones with cells grown under optimised conditions. Enantioselective reduction of aromatic ketoesters and preparation of intermediates for chemo-enzymatic synthesis of steroids and prostaglandins are among the biotransformations studied. Purification and characterization of ketoreductases from *P. glucozyma* are under study.

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