Stereoselective acyloin condensations of aromatic aldehydes with lyophilized yeast cells

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The biocatalytic synthesis of asymmetric chiral acyloins as intermediates in the production of active pharmaceutical ingredients is an attractive goal. For example, *R*-(-)-phenylacetylcarbinol (*R*-PAC), is the key chiral precursor for pseudoephedrine production. The use of pyruvate decarboxilase (PDC, E.C.4.1.1.1), a Mg(II) and thiamine diphosphate-dependent enzyme from yeasts as a biocatalyst, has been extensively studied and is now a well-recognized method for condensing aldehydes and pyruvic acid to form acyloins(α-hydroxyketones).

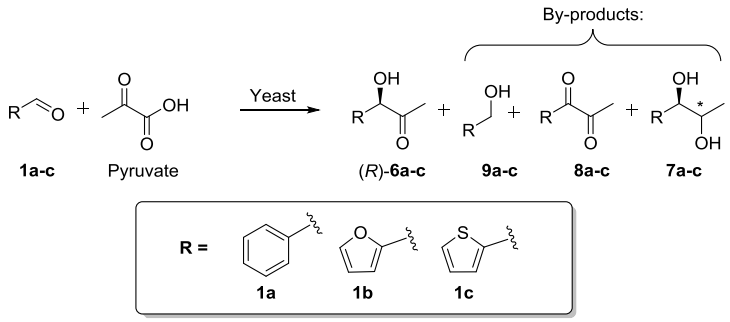

Figure 1. *Yeast promoted biotransformation of aldehydes **1a-c** for the efficient stereoselective synthesis of acyloins (R)-**6a-c**.*

In biotransformations mediated by whole cell microorganisms (**Figure 1**), by-product formation cannot be avoided. Consequently, screening for new microorganisms with high pyruvate decarboxilase and low oxido-reductase activity is still a challenging task. Moreover, by-product formation can be minimized by optimizing reaction conditions. In this work, the screening of several newly isolated yeasts in lyophilized whole cells form for acyloin production in aqueous media was investigated using aromatic and heteroaromatic aldehydes **1a-c**.

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