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Reversal of stereoselectivity in ERED-catalyzed reduction through a smart positioning of double bond

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PURPOSE OF THE ABSTRACT

Biocatalysis allows the environmental-friendly and cost-effective synthesis of intermediates or pharmacologically relevant compounds and is of particular interest for chiral molecules. Ene-reductases (EREDs) catalyze the asymmetric hydrogenation of alkenes in a highly stereoselective manner. We screened a large enzyme panel for the selective reduction of several key intermediates. Depending on the localization of the unsaturated C=C bond (internal vs external), we identified EREDs able to catalyze the formation of either the (R) or the (S) enantiomer with high enantiomeric excess (ee). Combining protein engineering and process development, we obtained an ERED able to fully convert the substrate to the desired product with great selectivity (> 98% ee) at lab scale.

FIGURES

FIGURE 1

FIGURE 2

KEYWORDS

Ene-reductase | Protein engineering | Process development

BIBLIOGRAPHY

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