

Transaminase (ATA)

Cat. No. ATA-08 **Lot. No.** (See product label)

SPECIFICATION

Product Overview

Description

Transaminases: A class of enzymes that catalyze amino transferring between amino acids and keto acids. Transaminases are key biological enzymes in asymmetric synthesis and racemic resolution of chiral amines. Aminotransferase can be divided into four classes according to sequence and structure: α -, β -, γ -, and δ -. ω -aminotransferases belong to class II transaminases, commonly be used in the preparation of chiral amines and unnatural amino acids, such as β -amino acids. ω -aminotransferases: In most cases, ω -transaminase refers to a class of enzymes, that catalytic ammonia transfer reactions without α -amino acid as substrate or product. ATA is a useful tool to catalyze regio- and stereoselective synthesis of chiral amines, amino acids and their derivatives from a variety of aliphatic and aromatic ketoacids, aldehydes, ketones and ketoses.

Applications

1. Enzyme screening should be carried out for specific substrates because of the substrate specificity, and get an enzyme that catalyzes the target substrate with best catalytic effect. 2. Never contact with extreme conditions such as: high temperature, high/low pH and organic solvent with high concentration. 3. Normally, the reaction system should include substrate, buffer solution, amino donor (such as amino acids and 1-phenyl ethylamine) or receptor (such as keto acids), coenzyme (PLP), cosolvent (such as DMSO). 4. ATA should be added last into reaction system, after the pH and temperature been adjusted to the reaction condition. 5. All kinds of ATA have various optimum reaction conditions, so each of them should be further studied individually.

 Tel: 1-631-559-9269 1-516-512-3133

 Email: info@creative-biomart.com  Fax: 1-631-938-8127

 45-1 Ramsey Road, Shirley, NY 11967, USA

Advantages

1. High substrate specificity.
2. Strong chiral selectivity.
3. High conversion efficiency.
4. Less by-products.
5. Mild reaction conditions.
6. Environmentally friendly.

GENE INFORMATION

Official Symbol

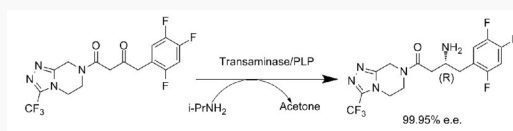
ATA

Synonyms

Transaminase; ATA

Application

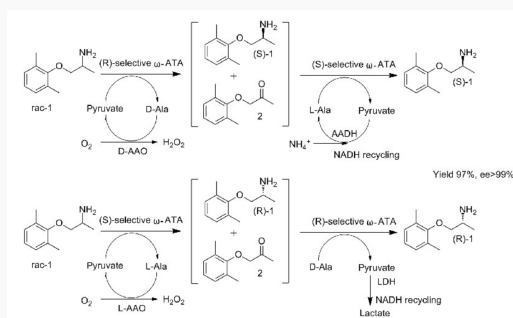
Examples



synthesis of Sitagliptin, asymmetric synthesis

Application

Examples



Mexiletine, Combination of kinetic resolution with asymmetric synthesis

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Chemical reaction scheme illustrating the biosynthesis of 2-aminopyridine derivatives. The scheme shows the conversion of PLP (pyridoxal phosphate) to an internal aldimine, then to an aldimine, and finally to an amine product. The reaction involves an enzyme (Enz) with a lysine (Lys) residue, an amine donor (R₁, R₂), and a co-product from the donor (R₃, R₄). The reaction is reversible, and the final product is an amine (R₃, R₄) and water (H₂O).

Key components and intermediates:

- PLP**: Pyridoxal phosphate, the starting material.
- Enz Lys**: Enzyme with a lysine residue, shown in a dashed box.
- Internal aldimine**: Intermediate formed by the reaction of PLP and Enz Lys.
- aldimine**: Intermediate formed by the reaction of the internal aldimine and an amine donor (R₁, R₂).
- amine product**: The final product, formed by the reaction of the aldimine and a co-product from the donor (R₃, R₄).
- P is phosphate**: A note indicating that P represents a phosphate group.