zymtronix™
NEXT WAVE BIOCATALYSIS

CASE STUDY

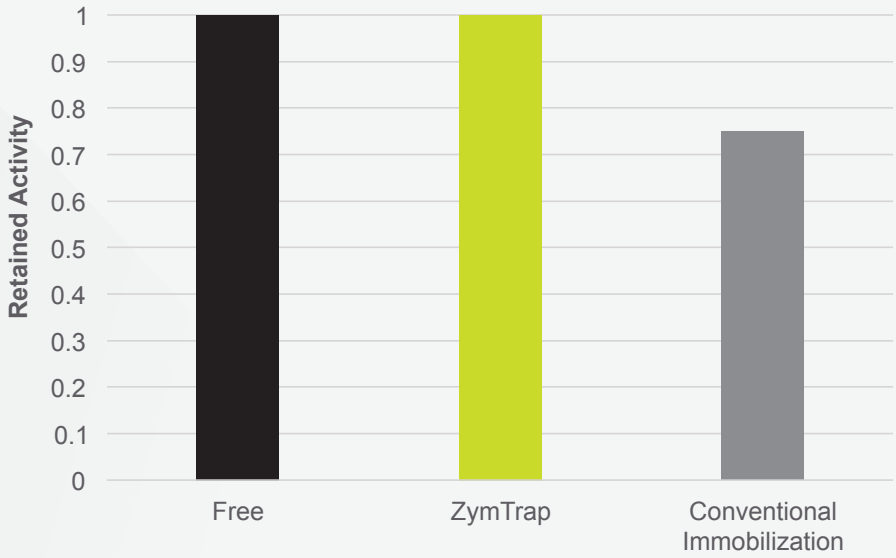
THE IMMOBILIZATION OF ω-TRANSAMINASES

4 IMMOBILIZATION OF ω-TRANSAMINASES

ω-Transaminases (EC 2.6.1.18) catalyze the transfer of amino groups from donor molecules to the position of a carboxyl group on a suitable acceptor [1]. These enzymes are observed in every organism and have a significant role in amino acid synthesis and nitrogen metabolism [1]. Due to their high stereoselectivity for substrates and stereospecificity for products, ω-transaminases can be used to make unnatural amino acids and pure chiral (i.e. exclusively “left-handed” or “right-handed”) amines or keto acids [1]. Currently, conventional chemical methods have a typical yield of only 50% for these molecules [2]. ω-Transaminases have applications in the production of active pharmaceutical intermediates, and in the foodstuffs and fragrance industries, since a “left-handed” molecule can have vastly different properties from its “right-handed” counterpart.

In an effort to capitalize on the industrial usefulness of ω-transaminase, Zymtronix has demonstrated 100% retained activity of magnetically-immobilized ω-transaminase relative to free enzyme for synthesis of acetophenone from (R)-(+)-α-methylbenzylamine (Figure 1) on its ZymTrap™ platform [3]. In comparison, conventional immobilization using biopolymer beads on E.coli containing ω-transaminase retained on average only 75% activity relative to free cells [4].

Figure 1 - ω-transaminase performance



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