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Effect of immobilization on the enantioselective esterification of ibuprofen using lipase from Candida cylinderacea

Sankarasubramanian Krishnan
College of Pharmacy, Sri Ramakrishna Institute of Paramedical Sciences, Coimbatore - 641 044, Tamil Nadu, India, karlakkrish@gmail.com

Srinivas Raj Madhumitha
College of Pharmacy, Sri Ramakrishna Institute of Paramedical Sciences, Coimbatore - 641 044, Tamil Nadu, India

Periyasamy Bharathi
College of Pharmacy, Sri Ramakrishna Institute of Paramedical Sciences, Coimbatore - 641 044, Tamil Nadu, India

Thengungal Kochupapy Ravi
College of Pharmacy, Sri Ramakrishna Institute of Paramedical Sciences, Coimbatore - 641 044, Tamil Nadu, India

Research Article

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Sankarasubramanian Krishnan*, Srinivas Raj Madhumitha, Periyasamy Bharathi, Thengungal Kochupapy Ravi

Email: karlakkrish@gmail.com

Abstract

The S-enantiomer of ibuprofen [2-(4-isobutylphenyl) propionic acid] contributes to most of the racemate's anti-inflammatory activity. Reports suggest that, in the case of *in vitro* synthesis of prostaglandins, the S-(+) enantiomer is almost 160 times more active than its antipode. In order to circumvent the undesired effects of the R-enantiomer of the profens, it is ideal to use the pure S-enantiomer. The ester of ibuprofen has also been reported to be used as a pro-drug. In this context the stereoselective esterification of ibuprofen was carried out using immobilized lipase from *Candida cylinderacea* using chitosan-xanthan and calcium alginate respectively. The effect of the immobilized lipase and free lipase on enantioselective esterification of ibuprofen using amyl alcohol as primary alcohol and isooctane as a solvent was also studied. The conversion of ibuprofen to its ester was monitored by thin layer chromatography (TLC) and high performance TLC (HPTLC) methods. Our result showed that, free lipase exhibited higher esterification than immobilized lipase. Free lipase from *Candida cylindracea* showed 24% more activity than lipase immobilized in chitosan-xanthan and 36% more activity than lipase immobilized in calcium alginate.

Key words: Ibuprofen, stereoselective esterification, chitosan-xanthan, immobilized lipase

Sankarasubramanian Krishnan*
Professor and Head, Department of Pharmaceutical Biotechnology, College of Pharmacy, Sri Ramakrishna Institute of Paramedical Sciences, Coimbatore - 641 044, Tamil Nadu, India

Srinivas Raj Madhumitha, Periyasamy Bharathi, Thengungal Kochupapy Ravi
College of Pharmacy, Sri Ramakrishna Institute of Paramedical Sciences, Coimbatore - 44, Tamil Nadu, India.India

* Corresponding Author

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