

Development of novel immobilized catalase delivery system through nanoencapsulation in Brij® niosomes.

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Abstract

One of the main challenges for successful pharmaceutical application of Catalase (CAT) is maintaining its stability. Physical immobilization of CAT through nano-encapsulation was proposed to resolve this challenge. CAT encapsulating niosomes (e-CAT) were prepared using different types of Brij® in presence of cholesterol (Ch). Kinetic parameters, pH optimum, thermal stability and reusability of CAT were determined. Results revealed that encapsulation enhanced CAT catalytic efficiency (V_{max}/K_m). Free CAT and e-CAT had pH optimum at 7.0. e-CAT exhibited improved thermal stability where it retained 50% residual activity at 60 °C. Free CAT lost its activity after 3 consecutive operational cycles however, e-CAT retained 60% of its initial activity following 12 cycles. Based on these encouraging results, CAT immobilization demonstrated a promising novel delivery system that enhances its operational stability.

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