

Thesis Title : Comparative study of enzymatic reagents using cholesterol oxidase from *Nocardia*, *Streptomyces* and *Pseudomonas* species for total serum cholesterol determination

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### ABSTRACT

Enzymatic method for serum cholesterol determination, commonly used in most of clinical laboratories, is more specific than chemical method. Disadvantage of this enzymatic method is due to its cost, especially the cost of cholesterol oxidase. In the present study, the reaction patterns of enzymatic reagent type I, II and III using respective cholesterol oxidase isolated from *Nocardia*, *Streptomyces* and *Pseudomonas* sp. were compared; and the effects of each chemical component in enzymatic reagent to different sources of cholesterol oxidase were also studied. Selection of enzymatic reagent suitable for total serum cholesterol determination for the clinical laboratory was also discussed. The results of cholesterol determined by all three types of enzymatic reagents in the Labsystem FP-901 Analyzer correlated well with those obtained by either the SMA II method and the Labsystem method using Commercial Enzymatic Reagent ( $r = 0.96-0.98$ ). Costs of cholesterol oxidase for final working enzymatic reagent type I (*Nocardia* sp.) is the most expensive (13 bahts/mL of reagent); while, the cheapest reagent is enzymatic reagent type II (*Streptomyces* sp.)

(4.4 bahts/mL of reagent). Enzymatic reagents for serum cholesterol determination using cholesterol oxidase from *Streptomyces* and *Pseudomonas* sp. gave satisfactory results with the expense of 66 and 60 percent lower than the enzymatic reagent using cholesterol oxidase from *Nocardia* sp. Enzymatic reagent using cholesterol oxidase from *Streptomyces* is suitable for total serum cholesterol determination in the clinical laboratory.