

Cholesterol Esterase and Cholesterol Oxidase



The determination of serum cholesterol concentration is one of the most widely performed assays in biochemistry. Elevated serum cholesterol is supposed to be a risk factor in the development of arteriosclerosis and myocardial infarction.

Cholesterol in blood is predominantly esterified with fatty acids and associated with lipoproteins. Total cholesterol, i.e. the sum of free and esterified cholesterol, can be accurately and conveniently measured enzymatically using cholesterol oxidase (cat. no. 17110) and cholesterol esterase (cat. no. 17108).

Cholesterol esterase which has a broad specificity towards the various fatty acid residues is used to cleave cholesterol esters to free cholesterol. Subsequently, Cholesterol oxidase transforms the steroid alcohol into cholest-4-ene-3-one and hydrogen peroxide which can be quantitated by a spectrophotometric assay e.g. the oxidative coupling of 4-aminoantipyrine and phenol in the presence of peroxidase to form a chromogen.

References:

1. Allain, C.C. et al. (1974) Clin. Chem. 20, 470-5.
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3. Smith, A.G. & Brooks, C.J.W. (1976) J. Steroid Biochem. 7, 705-13
4. Omodeo Salé, F. (1984) Anal. Biochem. 142, 347-50

Reaction Scheme for Cholesterol/Cholesterol Esterase Estimation

Cholesterol ester + H₂O cholesterol esterase → cholesterol + fatty acid

Cholesterol + O₂ + H₂O cholesterol oxidase → cholesten-3-one + H₂O₂

2H₂O₂ + phenol + 4-aminoantipyrine peroxidase → 4-benzoquinone-monoiminophenazone + 4 H₂O

Product Name	Cat.No.
Cholesterol esterase from porcine pancreas min. 35 U/mg lyophil.	17108
Cholesterol oxidase, recombinant <i>E.coli</i> min. 300 U/ml lyophil.	17110