

Product Information

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Cholesterol Esterase from bovine pancreas

Catalog Number **C3766**

Storage Temperature $-20\text{ }^{\circ}\text{C}$

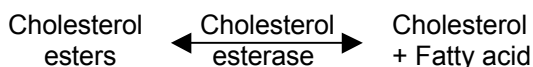
CAS RN 9026-00-0

EC 3.1.1.13

Synonyms: Bile salt activated lipase, sterol esterase, carboxyl ester lipase, steryl-ester acylhydrolase

Product Description

Excess cholesterol is stored intracellularly as cholesterol esters. Cholesterol esterase (CE) is a reversible enzyme that can hydrolyze or synthesize fatty acid esters of cholesterol and other sterols. Hydrolysis of water insoluble long chain fatty acid esters requires bile salt activation. Hydrolysis of water soluble esters of short chain fatty acids and lysophospholipids does not require activation by bile salts.¹ Cholesterol esterase catalyzes the following reaction:



While found primarily in the pancreas and pancreatic fluid, it occurs in other tissues as well. In the bovine adrenal cortex, this reaction is one of the rate limiting steps in steroidogenesis, involving the release of cholesterol from cytoplasmic cholesterol esters.² Cholesterol esterase bound to membrane-associated heparin on brush border membranes aids in the transport of cholesterol and free fatty acid across the membrane.³ This enzyme is widely used in the determination of serum cholesterol in clinical laboratories.⁴

Cholesterol esterase is a monomeric glycoprotein containing fucose residues.⁵ The interaction of cholic acid with pancreatic CE results in the formation of a 400 kDa hexamer.⁶ CE is a highly conserved protein of the α/β hydrolase family based on the nucleotide sequence from various species.¹

Molecular mass:^{7,8} 84 kDa (SDS-PAGE)

pH optimum:^{9,10} 7.0 (hydrolysis)
6.2 (esterification)

pH Range:⁷ 6–8

Temperature optimum:⁹ 37 °C

Substrates:
cholesteryl oleate¹² cholesteryl acetate¹³
4-nitrophenyl butyrate¹⁵ cholesteryl esters⁵
triacylglycerol² triolein⁵
2-(diethylamino)-4*H*-3,1-benzoxazin-4-one¹⁴
2-(diethylamino)-4*H*-thieno[2,3-*d*][1,3]oxazin-4-one¹⁴

K_M : cholesteryl oleate¹²
0.011 mM (in cholesteryl oleate vesicles)
0.099 mM (in liquid crystals)
4-nitrophenyl butyrate¹³
0.052 mM

Activators:
bisphenol A diglycidyl ether¹¹ ethanol¹³
phosphatidylcholine¹³ methanol¹³
phosphatidylethanolamine¹² *n*-butanol¹³
cAMP-dependent protein kinase, type II^{8,12}
sodium taurocholic acid⁵

Inhibitors:
bisphenol A methacrylate¹¹ Hg²⁺,⁸
diisopropylfluorophosphate⁸ PMSF⁶
enolase¹⁵ sodium fluoride⁸
phosphatidic acid¹² phosphatidylcholine¹²
p-chloromercuribenzoate⁶ phosphatidylserine¹²

K_i : bisphenol A methacrylate¹¹
0.0031 mM (pH 7.0, 22 °C)
2-(diethylamino)-4*H*-3,1-benzoxazin-4-one¹⁴
0.053 mM (pH 7.0, 25 °C)

This product (Catalog Number C3766) is partially purified from bovine pancreas and is supplied as an off-white to tan lyophilized powder containing 30–65% protein (biuret), potassium phosphate, and TRITON® X-100.

Specific activity: ≥ 200 units/g protein

Unit definition: one unit will hydrolyze 1.0 μ mole of cholesteryl oleate to cholesterol and oleic acid per minute at pH 7.0 at 37 °C in the presence of taurocholate.

Cholesterol esterase is assayed spectrophotometrically in a 3.0 ml reaction mixture containing 287 mM potassium phosphate, pH 7.0, 0.25% (w/v) taurocholic acid, 0.25% (w/v) cholic acid, 4–6 units peroxidase, 1.4 mM cholesteryl oleate, 1.7% (v/v) polyoxyethylene 9-lauryl ether, 0.14% (w/v) NaCl, 0.083% (w/v) phenol, 0.03% (w/v) 4-aminoantipyrine, 1–1.5 units cholesterol oxidase, and 0.013–0.143 unit cholesterol esterase.

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation Instructions

Cholesterol esterase is soluble in 0.4 M potassium phosphate, pH 7.0 (1 mg/ml).

Storage/Stability

Store the product at –20 °C. When stored at –20 °C, the product retains activity for at least one year.

References

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