

Product Information

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Cholesterol Esterase from porcine pancreas

Catalog Number **C9464**

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

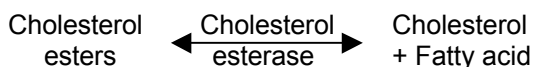
CAS RN 9026-00-0

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

Porcine cholesterol esterase exists as a 74 kDa monomeric form as well as a 167 kDa dimer. The dimer consists of two catalytic subunits, each with molecular masses ~ 9 kDa greater than the monomeric form.^{5,6}

Molecular mass:⁵ 167 kDa dimer

pH Optimum:⁷ 7.4

pH Range:⁸ 6.5–8.5

Temperature optimum:⁷ $25\text{ }^{\circ}\text{C}$

Substrates:

cholesteryl esters¹⁷ triacylglycerol²
4-nitrophenyl butyrate⁷ triolein⁹
2-(diethylamino)-4*H*-3,1-benzoxazin-4-one¹⁸
2-(diethylamino)-4*H*-thieno[2,3-*d*]oxazin-4-one¹⁸

K_M :⁷ 4-nitrophenyl butyrate
0.37 mM (with taurocholate)
0.73 mM (without taurocholate)

Activators:

ethanol⁹ methanol⁹
n-butanol⁹ sodium taurocholate¹⁰
sodium cholate¹¹

Inhibitors:

bisphenol A methacrylate¹² Hg²⁺,¹⁵
diisopropylfluorophosphate¹³ enolase¹⁴
sodium fluoride¹⁵ phosphatidic acid¹⁶
phosphatidylcholine¹⁶ phosphatidylserine¹⁶
4-nitrophenyl-*N*-substituted carbamates¹¹

K_i :

4-nitrophenyl-*N*-allyl carbamate¹¹ 0.0038 mM
4-nitrophenyl-*N*-butyl carbamate¹¹ 0.0026 mM
6-chloro-3-(2-cyclopentylethyl)-
2*H*-pyran-2-one⁷ 0.0008 mM
6-chloro-3-(2-phenylethyl)-5-methyl-
2*H*-pyran-2-one⁷ 0.00013 mM

This product (Catalog Number C9464) is partially purified from porcine pancreas and is supplied as a lyophilized powder containing $\sim 70\%$ protein (biuret), potassium phosphate, and a stabilizer.

Specific activity: $\geq 15,000$ units/g protein

Unit definition: one unit will hydrolyze 1.0 μmole of cholesteryl oleate to cholesterol and oleic acid per minute at pH 7.0 at $37\text{ }^{\circ}\text{C}$ 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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