

# Product Information

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## Cholesterol Esterase from *Pseudomonas* sp.

Catalog Number **C1403**

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

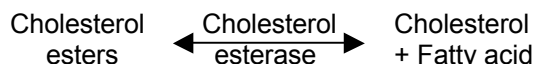
CAS RN 9026-00-0

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.<sup>1</sup> Cholesterol esterase catalyzes the following reaction:



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.<sup>2</sup> This enzyme is widely used in the determination of serum cholesterol in diagnostic laboratories.<sup>3</sup>

Molecular mass:  $\sim 300\text{ kDa}$

pH optimum: 7.6

pH range: 7.0–9.0

Temperature optimum:  $40\text{ }^{\circ}\text{C}$

Isoelectric point (pI):  $5.95 \pm 0.05$

Substrates (relative reaction rate): CE hydrolyzes long-chain and unsaturated fatty acid esters at a greater rate than short-chain and saturated fatty acid esters.

Linoleate (18:2)	100	Caprylate (8:0)	59
Oleate (18:1)	105	Caproate (6:0)	17
Stearate (18:0)	8.0	Propionate (3:0)	21
Palmitate (16:0)	34	Acetate (2:0)	2.9

$K_M$ :  $70\text{ }\mu\text{M}$  (cholesteryl oleate, pH 7.5)

Activators: cholic acid, glycocholic acid, BSA,  $\text{Mg}^{2+}$ , 0.3% (v/v) TRITON<sup>®</sup> X-100

Inhibitors:  $\text{Ag}^+$ ,  $\text{Hg}^{2+}$ , ionic detergents

This product is supplied as an off-white to tan lyophilized powder.

Specific activity:  $\geq 200,000$  units/g protein (biuret)

Unit definition: one unit will hydrolyze  $1.0\text{ }\mu\text{mole}$  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  $-20\text{ }^{\circ}\text{C}$ . When stored at  $-20\text{ }^{\circ}\text{C}$ , the enzyme retains activity for at least two years.

Reconstituted cholesterol esterase will remain stable at pH 6.0–6.5 for at least 25 hours at  $25\text{ }^{\circ}\text{C}$ .

## References

1. Hui, D.Y., and Howles, P. N., Carboxyl ester lipase: structure-function relationship and physiological role in lipoprotein metabolism and atherosclerosis. *J. Lipid Res.*, **43**, 2017-30 (2002).
2. Cook, K.G., *et al.*, Hormone-sensitive cholesterol ester hydrolase of bovine adrenal cortex: identification of the enzyme protein. *FEBS Lett.*, **132**, 10-14 (1981).
3. Allain, C.C., *et al.*, Enzymatic determination of total serum cholesterol. *Clin. Chem.*, **20**, 470-75 (1974).
4. Uwajima, T, *et al.*, Purification and properties of extracellular cholesterol esterase ester hydrolase of *Pseudomonas fluorescens*. *Agric. Biol. Chem.*, **39**, 1511-1512 (1975).

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