Product Information

3050 Spruce Street, Saint Louis, MO 63103 USA
Tel: (800) 521-8956 (314) 771-5765 Fax: (800) 325-5052 (314) 771-5757
email: techservice@sial.com sigma-aldrich.com

Cholesterol Oxidase
microbial, recombinant
expressed in *Escherichia coli*

Catalog Number **C1235**
Storage Temperature –20 °C

CAS RN 9028-76-6
EC 1.1.3.6
Synonyms: Cholesterol:oxygen oxidoreductase; 3β-hydroxy steroid oxidoreductase; CHOD; 3β-hydroxysteroid:oxygen oxidoreductase; cholesterol-O_2 oxidoreductase

Product Description
Cholesterol oxidase (CHOD) catalyzes the first step in cholesterol catabolism. Some non-pathogenic bacteria, such as *Streptomyces* are able to utilize cholesterol as a carbon source. Pathogenic bacteria, such as *Rhodococcus equi*, require CHOD to infect a host's macrophage.[1]

CHOD is bifunctional. Cholesterol is initially oxidized to cholest-5-en-3-one in an FAD-requiring step. The cholest-5-en-3-one is isomerized to cholest-4-en-3-one.[1] The isomerization reaction may be partially reversible.[2] The activity of CHOD depends on the physical properties of membrane to which the substrate is bound.[3] The net reaction is:

$$\text{Cholesterol} + O_2 \xrightarrow{\text{CHOD}} \text{cholest-4-en-3-one} + H_2O_2$$

CHOD is used to determine serum cholesterol.[4,5] It is the second most widely used enzyme in diagnostic applications after glucose oxidase.[6] CHOD also finds application in the microanalysis of steroids in food samples and in distinguishing 3-ketosteroids from 3β-hydroxysteroids.[7]

Transgenic plants expressing cholesterol oxidase are being investigated in the fight against the cotton boll weevil.[8] Cholesterol oxidase has also been used as a molecular probe to elucidate cellular membrane structures [3,9]

Cholesterol oxidase is a monomeric flavoprotein containing FAD.[1]
Molecular mass: 55 kDa (SDS-PAGE)
Cofactor: FAD

pH Optimum: 7.0

pH Stability: 5.0–0.0

K_M: 3.5×10^{-4} M (cholesterol)

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

This product is a recombinant, microbial enzyme purified from *E. coli*. It is supplied as a lyophilized powder containing ~25% protein (biuret), phosphate buffer salts, and EDTA.

Specific activity: ≥50 units/mg protein

Unit definition: one unit will convert 1.0 μmole of cholesterol to 4-cholesten-3-one per minute at pH 7.5 at 25 °C.
Note: 4-cholesten-3-one may undergo isomerization.

CHOD is assayed spectrophotometrically in a 3.0 ml reaction mixture containing 38 mM potassium phosphate, 0.009% (w/v) *o*-dianisidine, 0.017% (w/v) cholesterol, 0.33% (v/v) TRITON® X-100, 10 units of peroxidase, and 0.01–0.02 unit of cholesterol oxidase.

Other activities:
Catalase: none detected (detection limit, 1.0% of cholesterol oxidase activity)
Cholesterol esterase: none detected (detection limit, 0.01% of cholesterol oxidase activity)

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
CHOD is soluble in cold 50 mM potassium phosphate buffer, pH 7.0. Prepare solutions immediately before use.

Storage/Stability
Store product at –20 °C with desiccation. When stored at –20 °C, the enzyme retains activity for at least one year.

The activity of the enzyme in solution can decrease rapidly above 55 °C.

References

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