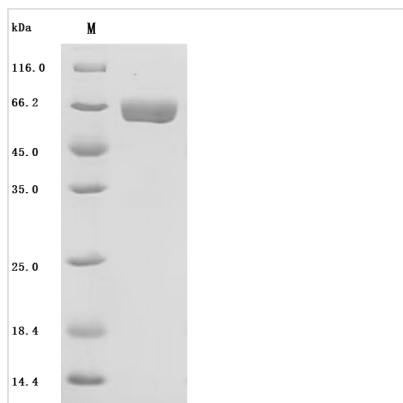




Recombinant Human Cocaine esterase (CES2) (Active)

Product Code	CSB-MP005259HU
Abbreviation	Recombinant Human CES2 protein (Active)
Storage	The shelf life is related to many factors, storage state, buffer ingredients, storage temperature and the stability of the protein itself. Generally, the shelf life of liquid form is 6 months at -20?/-80?. The shelf life of lyophilized form is 12 months at -20?/-80?.
Uniprot No.	O00748
Form	Lyophilized powder
Storage Buffer	Lyophilized from a 0.2 µm sterile filtered 20 mM Tris-HCl, 0.5 M NaCl, 6% Trehalose, pH 8.0
Product Type	Recombinant Protein
Immunogen Species	Homo sapiens (Human)
Biological Activity	Measured by its ability to hydrolyze p-nitrophenylacetate. The specific activity is >40000 pmol/min/µg.
Purity	Greater than 95% as determined by SDS-PAGE.
Sequence	QDSASPIRTTHTGQVLGSLVHVKGANAGVQTFLGIPFAKPPLGPLRFAPPEPP ESWSGVRDGTTHPAMCLQDLTAVESEFLSQFNMTFPSDSMSSEDCLYLSIYTP AHSHEGSNLPVMVWIHGGALVFGMASLYDGSM LAALENVVVVIIQYRLGVLGF FSTGDKHATGNWGYLDQVAALRWVQQNIAHFGGNPDRVTIFGESAGGTSVS SLVVSPISQGLFHGAIMESGVALLPGLIASSADVISTVVANLSACDQVDSEALVG CLRGKSKEEILAINKPFKMIPGVVDGVFLPRHPQELLASADFQPVPSIVGVNNN EFGWLIPKVMRIYDTQKEMDREASQAALQKMLTLLMLPPTFGDLLREEYIGDN GDPQTLQAQFQEMMADSMFVIPALQVAHFQCSRAPVYFYEFQHQP SWLKNIR PPHMKADHGDELFPVFRSFFGGNYIKFTEEEEQLSRKMMKYWANFARNGNP NGEGLPHWPLFDQEEQYLQLNLQPAVGRALKAHRLQFWKKALPQKIQELEEP EERHTEL
Source	Mammalian cell
Target Names	CES2
Expression Region	27-559aa
Notes	Repeated freezing and thawing is not recommended. Store working aliquots at 4? for up to one week.
Tag Info	C-terminal 10xHis-tagged
Mol. Weight	60.3 kDa
Protein Length	Full Length of Mature Protein
Image	



(Tris-Glycine gel) Discontinuous SDS-PAGE (reduced) with 5% enrichment gel and 15% separation gel.

Enzyme	Human CES2 (CSB-MP005259HU)	0.125µg/well
Substrate	4-Nitrophenyl Acetate (4-NPA) (Sigma N8130)	1mM
Reaction system	/	100µl
Reading Buffer	50 mM Tris , pH 8.0	100µl
Reaction conditions	37°C and 10min in dark	/
Assay Buffer	50 mM Tris , pH 7.5	/
Enzyme activity unit (U/mg)	>40000 pmol/min/µg	/

Activity

Measured by its ability to hydrolyze p-nitrophenylacetate. The specific activity is >40000 pmol/min/µg.

Description

Human CES2 protein is the recombinant human-derived CES2 protein, expressed by HEK293 cells, with a C-terminal 10xHis labeled tag. Its target gene corresponds to the 27-559aa of the human CES2. It has a high purity, up to 95% as determined by SDS-PAGE, and a low endotoxin level, less than 1.0 EU/ug as measured by the LAL method. It is an active protein as validated by its ability to hydrolyze p-nitrophenylacetate, with a specific activity greater than 40000 pmol/min/µg.

The human CES2 protein is a member of the carboxylesterase enzyme family, which plays a crucial role in the hydrolysis of ester and amide bonds in various substrates, including prodrugs and xenobiotics. CES2 is primarily expressed in the liver and small intestine, where it is involved in the metabolism of certain drugs, especially ester drugs, by converting them into their active forms, thereby enhancing the bioavailability of the drug [1][2]. This enzymatic activity is vital for the pharmacokinetics of these medications, influencing their efficacy and safety profiles.

In addition to its role in drug metabolism, CES2 has been implicated in lipid metabolism and homeostasis. Studies have shown that CES2 helps prevent liver steatosis by modulating lipolysis and endoplasmic reticulum stress, particularly under conditions of metabolic stress such as obesity and diabetes [3][4]. The expression of CES2 is downregulated in these conditions, which may contribute to the development of non-alcoholic fatty liver disease (NAFLD) [4]. The enzyme's activity can be influenced by various factors, including genetic polymorphisms and environmental conditions, which may lead to variability in drug metabolism among individuals [5].

References:

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Carboxylesterase 2 prevents liver steatosis by modulating lipolysis, endoplasmic reticulum stress, and lipogenesis and is regulated by hepatocyte nuclear factor 4 alpha in mice, Hepatology, vol. 63, no. 6, p. 1860-1874, 2016.

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Human carboxylesterase 2 reverses obesity-induced diacylglycerol accumulation and glucose intolerance, Cell Reports, vol. 18, no. 3, p. 636-646, 2017. <https://doi.org/10.1016/j.celrep.2016.12.070>

[5] J. Liu, X. Shang, S. Huang, Y. Xu, J. Lu, Y. Zhang, et al. Construction and characterization of crispr/cas9 knockout rat model of carboxylesterase 2a gene, Molecular Pharmacology, vol. 100, no. 5, p. 480-490, 2021.

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Endotoxin	Less than 1.0 EU/ug as determined by LAL method.
Reconstitution	We recommend that this vial be briefly centrifuged prior to opening to bring the contents to the bottom. Please reconstitute protein in deionized sterile water to a concentration of 0.1-1.0 mg/mL. We recommend to add 5-50% of glycerol (final concentration) and aliquot for long-term storage at -20°C/-80°C. Our default final concentration of glycerol is 50%. Customers could use it as reference.
Shelf Life	The shelf life is related to many factors, storage state, buffer ingredients, storage temperature and the stability of the protein itself. Generally, the shelf life of liquid form is 6 months at -20°C/-80°C. The shelf life of lyophilized form is 12 months at -20°C/-80°C.