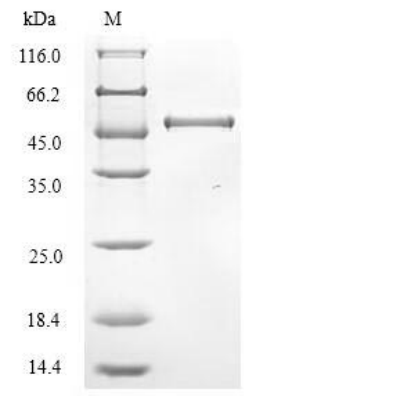
Recombinant Bovine coronavirus Hemagglutinin-esterase (HE)

Product Code	CSB-YP323648BJK
Relevance	Structural protein that makes short spikes at the surface of the virus. Contains receptor binding and receptor-destroying activities. Mediates de-O-acetylation of N-acetyl-9-O-acetylneuraminic acid, which is probably the receptor determinant recognized by the virus on the surface of erythrocytes and susceptible cells. This receptor-destroying activity is important for virus release as it probably helps preventing self-aggregation and ensures the efficient spread of the progeny virus from cell to cell. May serve as a secondary viral attachment protein for initiating infection, the spike protein being the major one. Ses to be a 'luxury' protein that is not absolutely necessary for virus infection in culture. However, its presence in the virus may alter its pathogenicity. May become a target for both the humoral and the cellular branches of the immune syst.
Abbreviation	Recombinant Bovine coronavirus Hemagglutinin-esterase
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°C/-80°C. The shelf life of lyophilized form is 12 months at -20°C/-80°C.
Uniprot No.	P15776
Alias	E3 glycoprotein
Product Type	Recombinant Protein
Immunogen Species	Bovine coronavirus (strain Mebus) (BCoV) (BCV)
Purity	Greater than 90% as determined by SDS-PAGE.
Sequence	FDNPPTNVVSHLNGDWFLFGDSRSDCNHVVNTNPRNYSYMDLNPALCDSGKI SSKAGNSIFRSFHFTDFYNYTGEGQQIIFYEGVNFTPYHAFKCTTSGSNDIWM QNKGLFYTQVYKNMAVYRSLTFVNVPYVYNGSAQSTALCKSGSLVLNNPAYIA REANFGDYYYKVEADFYLSGCDEYIVPLCIFNGKFLSNTKYYDDSQYYFNKDT GVIYGLNSTETITTGFDFNCHYLVLPSGNYLAISNELLLTVPTKAICLNKRKDFTP VQVVDSRWNNARQSDNMTAVACQPPYCYFRNSTTNYVGVYDINHGDAGFTSI LSGLLYDSPCFSQQGVFRYDNVSSVWPLYSYGRCPTAADINTPDVPICVYDPL PLILLGILLGVAVIIIVVLLLYFMVDNGTRLHDA
Research Area	Others
Source	Yeast
Target Names	HE
Protein Names	Recommended name: Hemagglutinin-esterase Short name= HE protein EC= 3.1.1.53Alternative name(s): E3 glycoprotein
Expression Region	19-424aa
Notes	Repeated freezing and thawing is not recommended. Store working aliquots at

	4°C for up to one week.
Tag Info	N-terminal 6xHis-tagged
Mol. Weight	47.7kDa
Protein Length	Full Length of Mature Protein

Image



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

Description

Hemagglutinin-esterase (HE) is a glycoprotein found in various viruses, including coronaviruses and influenza viruses. In coronaviruses, HE acts as a second viral attachment protein alongside the spike protein, facilitating the initiation of infection [1]. It plays a crucial role in receptor binding, receptor destroying, and membrane fusion activities in influenza C viruses, while influenza A and B viruses have separate proteins for these functions [2]. HE has been identified as a structural protein in SARS-CoV-2, contributing to the entry and release processes of the virus [3].

The enzymatic activity associated with HE is linked to its homodimeric structure, influencing virus evolution and interactions with host cells [4]. Studies have shown functional similarities between HE proteins of different viruses, such as infectious salmon anaemia virus, toroviruses, and influenza C virus, indicating a conserved role across viral families [5]. The HEF protein in influenza D virus has been highlighted for its exceptional stability and multifunctionality in receptor binding, destroying, and membrane fusion [6].

In terms of viral classification, influenza C viruses possess the hemagglutinin-esterase-fusion (HEF) protein as their primary surface glycoprotein, distinguishing them from influenza A and B viruses [7]. The genetic and antigenic diversity of influenza D viruses in cattle has been linked to the presence of distinct lineages of HE proteins [7]. Furthermore, the HE gene in coronaviruses is positioned adjacent to the spike protein gene, emphasizing its significance in viral structure and function [8].

References:

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[2] B. Hause, M. Ducatez, E. Collin, Z. Ran, R. Liu, Z. Shenget al., "Isolation of a

novel swine influenza virus from oklahoma in 2011 which is distantly related to human influenza c viruses", Plos Pathogens, vol. 9, no. 2, p. e1003176, 2013. https://doi.org/10.1371/journal.ppat.1003176
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[6] J. Yu, B. Hika, R. Liu, Z. Sheng, B. Hause, L. Fenget al., "The hemagglutinin-esterase fusion glycoprotein is a primary determinant of the exceptional thermal and acid stability of influenza d virus", Msphere, vol. 2, no. 4, 2017. https://doi.org/10.1128/msphere.00254-17
[7] E. Collin, Z. Sheng, Y. Lang, W. Ma, B. Hause, & L. Feng, "Cocirculation of two distinct genetic and antigenic lineages of proposed influenza d virus in cattle", Journal of Virology, vol. 89, no. 2, p. 1036-1042, 2015. https://doi.org/10.1128/jvi.02718-14
[8] D. Brian, B. Hogue, & T. Kienzle, "The coronavirus hemagglutinin esterase glycoprotein",, p. 165-179, 1995. https://doi.org/10.1007/978-1-4899-1531-3_8

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.