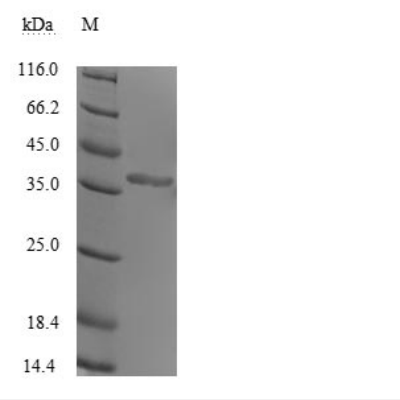
Recombinant Human rhinovirus A serotype 89 Genome polyprotein, partial

Product Code	CSB-EP362073HQDb0
Relevance	Capsid protein VP1: Forms an icosahedral capsid of pseudo T=3 symmetry with capsid proteins VP2 and VP3. The capsid is 300 Angstroms in diameter, composed of 60 copies of each capsid protein and enclosing the viral positive strand RNA genome. Capsid protein VP1 mainly forms the vertices of the capsid. Capsid protein VP1 interacts with host cell receptor to provide virion attachment to target host cells. This attachment induces virion internalization. Tyrosine kinases are probably involved in the entry process. After binding to its receptor, the capsid undergoes conformational changes. Capsid protein VP1 N-terminus (that contains an amphipathic alpha-helix) and capsid protein VP4 are externalized. Together, they shape a pore in the host membrane through which viral genome is translocated to host cell cytoplasm. After genome has been released, the channel shrinks
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.	P07210
Product Type	Recombinant Protein
Immunogen Species	Human rhinovirus A serotype 89 (strain 41467-Gallo) (HRV-89)
Purity	Greater than 85% as determined by SDS-PAGE.
Sequence	NPVENYIDSVLNEVLVVPNIQPSTSVSSHAAPALDAAETGHTSSVQPEDMIETR YVITDQTRDETSIESFLGRSGCIAMIEFNTSSDKTEHDKIGKGFKTWKVSLQEM AQIRRKYELFTYTRFDSEITIVTAAAAQGNDSGHIVLQFMYVPPGAPVPEKRDD YTWQSGTNASVFWQEGQPYPRFTIPFMSIASAYYMFYDGYDGDSAASKYGSV VTNDMGTICVRIVTSNQKHDSNIVCRIYHKAKHIKAWCPRPPRAVAYQHTHSTN YIPSNGEATTQIKTRPDVFTVTNV
Lead Time	3-7 business days
Research Area	others
Source	E.coli
Expression Region	575-866aa
Notes	Repeated freezing and thawing is not recommended. Store working aliquots at 4°C for up to one week.
Tag Info	N-terminal 10xHis-tagged
Mol. Weight	38.1 kDa
Protein Description	Partial

Image



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

Description

The genome polyprotein is a precursor molecule that is translated from a viral RNA and is subsequently cleaved into individual functional proteins. This strategy of genome expression is utilized by various positive-strand RNA viruses, including plant viruses and animal viruses [1]. The maturation process of viral polyproteins is crucial for viral replication, as it enables the synthesis of new viral genomes and the functionality of viral proteins [2]. For instance, the genome of Rubella virus encodes a polyprotein precursor, which is subsequently processed into nonstructural proteins that support viral replication [3]. Similarly, the genome of SARS-CoV-2, like other coronaviruses, encodes polyproteins that require processing into functional proteins [4].

The polyprotein is initially translated as a single large molecule, which is then processed by proteolytic cleavage into smaller, functional proteins [5]. This processing is essential for the regulation of viral replication and maturation [6]. The cleavages within the replicase polyproteins are carried out by the virus's own enzymes, highlighting the intricate mechanisms involved in polyprotein processing [7]. Moreover, the polyprotein processing is a critical step in the assembly of functional viral replication complexes, which regulate RNA synthesis in viruses such as Sindbis virus [8].

The polyprotein processing involves post-translational proteolytic cleavage, which is a mechanism utilized by potyviruses for genome expression [9]. Additionally, the hepatitis C virus genome encodes a precursor polyprotein that undergoes processing into functional proteins by both host and viral proteases [10]. This exemplifies the significance of polyprotein processing in the life cycle of diverse viruses.

References:

[1] R. Margis, C. Ritzenthaler, J. Reinbolt, M. Pinck, & L. Pinck, "Genome organization of grapevine fanleaf nepovirus rna2 deduced from the 122k polyprotein p2 in vitro cleavage products", Journal of General Virology, vol. 74, no. 9, p. 1919-1926, 1993. https://doi.org/10.1099/0022-1317-74-9-1919
[2] J. Habersetzer, M. Debbah, M. Fogeron, A. Böckmann, S. Bressanelli, & S. Fieulaine, "In vitro translation of virally-encoded replication polyproteins to recapitulate polyprotein maturation processes", Protein Expression and Purification, vol. 175, p. 105694, 2020. https://doi.org/10.1016/j.pep.2020.105694

[3] M. Sakata, H. Katoh, N. Otsuki, K. Okamoto, Y. Nakatsu, C. Limet al., "Heat shock protein 90 ensures the integrity of rubella virus p150 protein and supports viral replication", Journal of Virology, vol. 93, no. 22, 2019. https://doi.org/10.1128/jvi.01142-19
[4] Q. Li and C. Kang, "Progress in developing inhibitors of sars-cov-2 3c-like protease", Microorganisms, vol. 8, no. 8, p. 1250, 2020. https://doi.org/10.3390/microorganisms8081250
[5] C. Robaglia, M. Durand-Tardif, M. Tronchet, G. Boudazin, S. Astier-Manifacier, & F. Casse-Delbart, "Nucleotide sequence of potato virus y (n strain) genomic rna", Journal of General Virology, vol. 70, no. 4, p. 935-947, 1989. https://doi.org/10.1099/0022-1317-70-4-935
[6] S. Yost and J. Marcotrigiano, "Viral precursor polyproteins: keys of regulation from replication to maturation", Current Opinion in Virology, vol. 3, no. 2, p. 137-142, 2013. https://doi.org/10.1016/j.coviro.2013.03.009
[7] A. Lulla, V. Lulla, & A. Merits, "Macromolecular assembly-driven processing of the 2/3 cleavage site in the alphavirus replicase polyprotein", Journal of Virology, vol. 86, no. 1, p. 553-565, 2012. https://doi.org/10.1128/jvi.05195-11
[8] J. Lemm, T. Rümenapf, E. Strauss, J. Strauss, & C. Rice, "Polypeptide requirements for assembly of functional sindbis virus replication complexes: a model for the temporal regulation of minus- and plus-strand rna synthesis.", The Embo Journal, vol. 13, no. 12, p. 2925-2934, 1994. https://doi.org/10.1002/j.1460-2075.1994.tb06587.x
[9] L. Domier, K. Franklin, M. Shahabuddin, G. Hellmann, J. Overmeyer, S. Hiremathet al., "The nucleotide sequence of tobacco vein mottling virus rna", Nucleic Acids Research, vol. 14, no. 13, p. 5417-5430, 1986. https://doi.org/10.1093/nar/14.13.5417
[10] A. Owsianka, R. Clayton, L. Loomis-Price, J. McKeating, & A. Patel, "Functional analysis of hepatitis c virus e2 glycoproteins and virus-like particles reveals structural dissimilarities between different forms of e2", Journal of General Virology, vol. 82, no. 8, p. 1877-1883, 2001. https://doi.org/10.1099/0022-1317-82-8-1877

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.