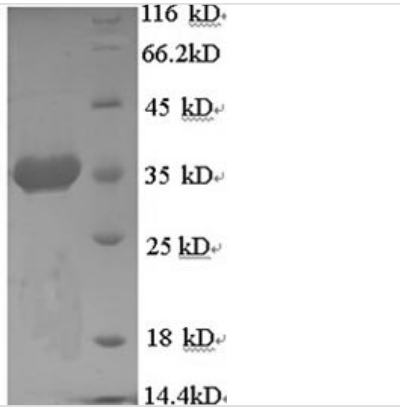
Recombinant Human Endoplasmic reticulum chaperone BiP (HSPA5), partial

Product Code	CSB-EP010827HU1
Relevance	Probably plays a role in facilitating the assbly of multimeric protein complexes inside the endoplasmic reticulum. Involved in the correct folding of proteins and degradation of misfolded proteins via its interaction with DNAJC10, probably to facilitate the release of DNAJC10 from its substrate.
Abbreviation	Recombinant Human HSPA5 protein, partial
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.	P11021
Product Type	Recombinant Proteins
Immunogen Species	Homo sapiens (Human)
Purity	Greater than 90% as determined by SDS-PAGE.
Sequence	EDVGTVVGIDLGTTYSCVGVFKNGRVEIIANDQGNRITPSYVAFTPEGERLIGD AAKNQLTSNPENTVFDAKRLIGRTWNDPSVQQDIKFLPFKVVEKKTKPYIQVDI GGGQTKTFAPEEISAMVLTKMKETAEAYLGKKVTHAVVTVPAYFNDAQRQATK DAGTIAGLNVMRIINEPTAAAIAYGLDKREGEKNILVFDLGGGTFDVSLLTIDNG VFEVVATNGDTHLGGEDFDQRVMEHFIKLYKKKTGKDVRKDNRAVQKLRREV E
Research Area	Others
Source	E.coli
Target Names	HSPA5
Expression Region	25-293aa
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	33.6kDa
Protein Length	Partial
Image	



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

Description

Steps for preparing the recombinant human endoplasmic reticulum chaperone BiP (HSPA5) protein include synthesizing the gene that encodes the partial HSPA5 protein (25-293aa) and co-cloning the gene in a suitable vector with the N-terminal 6xHis-tag gene, followed by transforming the constructed vector into E.coli cells for protein expression. The obtained protein is purified from the cell lysate through affinity chromatography. Its purity is up to 90% as measured by SDS-PAGE.

HSPA5, also known as BiP or GRP78, is a crucial protein belonging to the Hsp70 family. It acts as a master chaperone protein primarily located in the endoplasmic reticulum (ER). HSPA5 plays a vital role in protein folding processes by responding to the accumulation of misfolded or unfolded proteins in the ER [1][2]. It interacts with other chaperone proteins like DNAJC10 to facilitate correct protein folding or degradation of misfolded proteins [1]. Moreover, HSPA5 regulates gene expression and alternative splicing related to inflammatory and immune responses [3].

Research indicates that HSPA5 is a calcium-binding protein that influences calcium transfer between the ER and mitochondria, thereby contributing to maintaining mitochondrial function [3]. HSPA5 has been identified as a key player in various diseases, such as nonalcoholic fatty liver disease and cancer [2][4]. Studies have shown that HSPA5 can bind directly to specific proteins like TDP-43, mitigating toxicity associated with neurodegenerative diseases [5][6]. Additionally, HSPA5 has been linked to apoptosis regulation, making it a potential target for cancer therapies [7].

References:

[1] T. Li, New progresses on cell surface protein hspa5/bip/grp78 in cancers and covid-19, Frontiers in Immunology, vol. 14, 2023. https://doi.org/10.3389/fimmu.2023.1166680
[2] A. Rehati, B. Abuduaini, L. Zhao, D. Chen, & F. He, Identification of heat shock protein family a member 5 (hspa5) targets involved in nonalcoholic fatty liver disease, Genes and Immunity, vol. 24, no. 3, p. 124-129, 2023. https://doi.org/10.1038/s41435-023-00205-y
[3] H. Fan, L. Xue, Y. Liu, D. Zuo, F. Gao, H. Liet al., Hspa5 regulates the expression and alternative splicing of inflammatory and immune response genes.,, 2021. https://doi.org/10.21203/rs.3.rs-397944/v1
[4] L. Booth, J. Roberts, & P. Dent, Hspa5/dna k may be a useful target for

human disease therapies, Dna and Cell Biology, vol. 34, no. 3, p. 153-158, 2015. https://doi.org/10.1089/dna.2015.2808
[5] L. François-Moutal, D. Scott, A. Ambrose, C. Zerio, K. Dissanayake, D. Mayet al., Heat shock protein grp78/bip/hspa5 binds directly to tdp-43 and mitigates toxicity associated with neurodegenerative disease pathology,, 2021. https://doi.org/10.21203/rs.3.rs-1090289/v1
[6] L. François?Moutal, D. Scott, A. Ambrose, C. Zerio, M. Rodriguez-Sanchez, K. Dissanayakeet al., Heat shock protein grp78/bip/hspa5 binds directly to tdp-43 and mitigates toxicity associated with disease pathology, Scientific Reports, vol. 12, no. 1, 2022. https://doi.org/10.1038/s41598-022-12191-8
[7] F. Uckun, S. Qazi, Z. Ozer, A. Garner, J. Pitt, H. Maet al., Inducing apoptosis in chemotherapy?resistant b?lineage acute lymphoblastic leukaemia cells by targeting hspa5, a master regulator of the anti?apoptotic unfolded protein response signalling network, British Journal of Haematology, vol. 153, no. 6, p. 741-752, 2011. https://doi.org/10.1111/j.1365-2141.2011.08671.x
[8] M. Komatsu, P62 bodies: phase separation, nrf2 activation, and selective autophagic degradation, Iubmb Life, vol. 74, no. 12, p. 1200-1208, 2022. https://doi.org/10.1002/iub.2689
[9] D. Lee, D. Kim, S. Kim, S. Jeong, J. Kim, S. Shimet al., Park7 modulates autophagic proteolysis through binding to the n-terminally arginylated form of the molecular chaperone hspa5, Autophagy, vol. 14, no. 11, p. 1870-1885, 2018. https://doi.org/10.1080/15548627.2018.1491212

Shelf Life

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