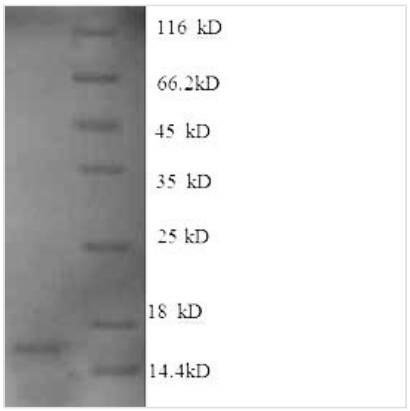
Recombinant Human Growth/differentiation factor 15 (GDF15), partial

Product Code	CSB-EP859530HU
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.	Q99988
Alias	Macrophage inhibitory cytokine 1 ;MIC-1NSAID-activated gene 1 protein ;NAG-1NSAID-regulated gene 1 protein ;NRG-1;Placental TGF-betaPlacental bone morphogenetic protein;Prostate differentiation factor
Product Type	Recombinant Protein
Immunogen Species	Homo sapiens (Human)
Purity	Greater than 90% as determined by SDS-PAGE.
Sequence	RNGDHCPLGPGRCCRLHTVRASLEDLGWADWVLSPREVQVTMCIGACPSQF RAANMHAQIKTSLHRLKPDTVPAPCCVPASYNPMVLIQKTDTGVSLQTYDDLL AKDCHCI
Lead Time	3-7 business days
Research Area	Cardiovascular
Source	E.coli
Gene Names	GDF15
Expression Region	198-308aa
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	16.2kDa
Protein Description	Partial

Image



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

Description

The recombinant human GDF15 protein with an N-terminal 6xHis tag is produced by co-cloning its gene fragment (198-308aa) with the tag gene into an expression vector. The recombinant vectors are transformed into E. coli cells, which are subsequently grown and induced with IPTG to express the recombinant GDF15. Cells are lysed to release the GDF15 protein, which is then purified using affinity chromatography. The recombinant GDF15 protein is subjected to SDS-PAGE analysis, where the gel confirms that the purity of the final product exceeds 90%.

Human GDF15 is a member of the TGF-β superfamily, which plays a significant role in various physiological and pathological processes. It is primarily produced in the liver, although it is also expressed in other tissues, including the heart, lungs, and skeletal muscle [1][2]. GDF15 is known for its involvement in cellular responses to stress, inflammation, and injury, making it a critical biomarker for several diseases, including cancer, cardiovascular diseases, and metabolic disorders [1][3].

GDF15 is well-known for its role in the regulation of energy homeostasis and appetite. It has been shown to influence appetite regulation by acting on the central nervous system, particularly in the hypothalamus, where it can suppress the production of pro-inflammatory cytokines, thus facilitating metabolic adaptations during stress [4][5]. Furthermore, GDF15 levels are elevated in conditions such as obesity and non-alcoholic fatty liver disease (NAFLD), suggesting its potential role as a protective mechanism against inflammation and metabolic dysfunction [6][7]. Studies have indicated that GDF15 may enhance hepatic triglyceride export, thereby mitigating liver damage in individuals with NAFLD [6].

GDF15 has been implicated in tumor growth and progression. Research has demonstrated that GDF15 can stimulate the growth and invasion of ovarian cancer cells, highlighting its potential role as a tumor-promoting factor [8]. Additionally, elevated serum levels of GDF15 have been associated with poor prognosis in various cancers, including hepatocellular carcinoma (HCC), where it correlates with disease stage and patient outcomes [9]. This dual role of GDF15 as both a biomarker and a potential therapeutic target in cancer underscores its significance in oncological research.

References:

[1] Y. Fujita, M. Ito, T. Kojima, S. Yatsuga, Y. Koga, & M. Tanaka. Gdf15 is a novel biomarker to evaluate efficacy of pyruvate therapy for mitochondrial diseases, Mitochondrion, vol. 20, p. 34-42, 2015. https://doi.org/10.1016/j.mito.2014.10.006
[2] M. Zhang, A. Bagán, D. Martínez, E. Barroso, X. Palomer, S. Vázquez, et al. Design and synthesis of ampk activators and gdf15 inducers, Molecules, vol. 28, no. 14, p. 5468, 2023. https://doi.org/10.3390/molecules28145468
[3] H. Chung, J. Kim, H. Kim, M. Kwon, S. Kim, M. Shong, et al. Gdf15 deficiency exacerbates chronic alcohol- and carbon tetrachloride-induced liver injury, Scientific Reports, vol. 7, no. 1, 2017. https://doi.org/10.1038/s41598-017-17574-w

[4] M. Fejzo, O. Sazonova, J. Sathirapongsasuti, I. Hallgrímsdóttir, V. Vacic, K. MacGibbon, et al. Placenta and appetite genes gdf15 and igfbp7 are associated with hyperemesis gravidarum, Nature Communications, vol. 9, no. 1, 2018. https://doi.org/10.1038/s41467-018-03258-0
[5] S. Lehmann, B. Kochlik, M. Kleinert, ?. Schimrigk, U. Müller?Werdan, & K. Norman, The effect of dextrose or protein ingestion on circulating growth differentiation factor 15 and appetite in older compared to younger women, Nutrients, vol. 14, no. 19, p. 4066, 2022. https://doi.org/10.3390/nu14194066
[6] B. Galuppo, C. Agazzi, B. Pierpont, J. Chick, Z. Li, S. Caprio, et al. Growth differentiation factor 15 (gdf15) is associated with non-alcoholic fatty liver disease (nafld) in youth with overweight or obesity, Nutrition and Diabetes, vol. 12, no. 1, 2022. https://doi.org/10.1038/s41387-022-00187-2
[7] B. Koo, S. Um, D. Seo, S. Joo, J. Bae, J. Park, et al. Growth differentiation factor 15 predicts advanced fibrosis in biopsy?proven non?alcoholic fatty liver disease, Liver International, vol. 38, no. 4, p. 695-705, 2017. https://doi.org/10.1111/liv.13587
[8] S. Griner, J. Joshi, & R. Nahta, Growth differentiation factor 15 stimulates rapamycin-sensitive ovarian cancer cell growth and invasion, Biochemical Pharmacology, vol. 85, no. 1, p. 46-58, 2013. https://doi.org/10.1016/j.bcp.2012.10.007
[9] Y. Myojin, H. Hikita, M. Sugiyama, Y. Sasaki, K. Fukumoto, S. Sakaneet al., Hepatic stellate cells in hepatocellular carcinoma promote tumor growth via growth differentiation factor 15 production, Gastroenterology, vol. 160, no. 5, p. 1741-1754.e16, 2021. https://doi.org/10.1053/j.gastro.2020.12.015

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.