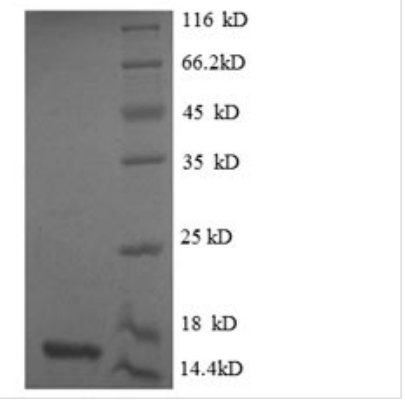
Recombinant Human Growth/differentiation factor 8 (MSTN)

Product Code	CSB-EP015057HU
Relevance	Acts specifically as a negative regulator of skeletal muscle growth.
Abbreviation	Recombinant Human MSTN protein
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.	O14793
Alias	Myostatin
Product Type	Recombinant Protein
Immunogen Species	Homo sapiens (Human)
Purity	Greater than 90% as determined by SDS-PAGE.
Sequence	DFGLDCDEHSTESRCCRYPLTVDFEAFGWDWIIAPKRYKANYCSGECEFVFL QKYPHTHLVHQANPRGSAGPCCTPTKMSPINMLYFNGKEQIIYGKIPAMVVDR CGCS
Research Area	Signal Transduction
Source	E.coli
Target Names	MSTN
Expression Region	267-375aa
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	16.4kDa
Protein Length	Full Length of Mature Protein
Image	



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

Description

To produce recombinant human MSTN protein, the MSTN gene fragment (267-375aa) with the N-terminal 6xHis-tag gene is first cloned into an expression vector, which is subsequently introduced into E. coli cells. After the E. coli cells express the protein, it is subjected to affinity chromatography purification. Once the protein is isolated, its purity is evaluated using SDS-PAGE, greater than 90%. This high purity ensures the protein's effectiveness in the research associated with MSTN signal transduction.

Human myostatin (MSTN), also known as GDF-8, is a critical regulator of skeletal muscle growth and development. It belongs to the TGF-β superfamily and is primarily produced by myocytes. Myostatin functions as a myokine, exerting autocrine and paracrine effects that inhibit muscle cell proliferation and differentiation, thereby playing a significant role in muscle mass regulation [1][2][3].

The mechanism of action of myostatin involves its binding to the activin type II receptor (ActRIIB), which activates downstream signaling pathways, particularly the Smad pathway. This leads to the upregulation of cyclin-dependent kinase inhibitors such as p21, which subsequently inhibits cell cycle progression and promotes muscle atrophy [4][5]. Myostatin's inhibitory role is further underscored by studies demonstrating that blocking its signaling can lead to muscle hypertrophy and hyperplasia, indicating its function as a negative regulator of muscle mass [5][2][6].

References:
[1] A. Ryan and G. Li. Skeletal muscle myostatin gene expression and sarcopenia in overweight and obese middle?aged and older adults, JCSM Clinical Reports, vol. 6, no. 4, p. 137-142, 2021. https://doi.org/10.1002/crt2.43
[2] M. Saitoh, J. Ishida, N. Ebner, S. Anker, J. Springer, & S. Haehling. Myostatin inhibitors as pharmacological treatment for muscle wasting and muscular dystrophy, JCSM Clinical Reports, vol. 2, no. 1, p. 1-10, 2017. https://doi.org/10.17987/jcsm-cr.v2i1.37
[3] S. Lee and A. McPherron. Regulation of myostatin activity and muscle growth, Proceedings of the National Academy of Sciences, vol. 98, no. 16, p. 9306-9311, 2001. https://doi.org/10.1073/pnas.151270098
[4] C. McFarlane, G. Hui, et al. Human myostatin negatively regulates human myoblast growth and differentiation, Ajp Cell Physiology, vol. 301, no. 1, p. C195-C203, 2011. https://doi.org/10.1152/ajpcell.00012.2011
[5] Y. Chen, C. Gregory, M. Scarborough, R. Shi, G. Walter, & K. Vandenborne. Transcriptional pathways associated with skeletal muscle disuse atrophy in humans, Physiological Genomics, vol. 31, no. 3, p. 510-520, 2007. https://doi.org/10.1152/physiolgenomics.00115.2006
[6] E. Kellum, H. Starr, et al. Myostatin (gdf-8) deficiency increases fracture callus size, sox-5 expression, and callus bone volume, Bone, vol. 44, no. 1, p. 17-23, 2009. https://doi.org/10.1016/j.bone.2008.08.126

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.