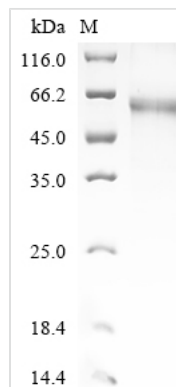




Recombinant Human Thyrotropin receptor (TSHR), partial

Product Code	CSB-BP025131HU1
Abbreviation	Recombinant Human TSHR 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.	P16473
Form	Liquid or Lyophilized powder
Storage Buffer	If the delivery form is liquid, the default storage buffer is Tris/PBS-based buffer, 5%-50% glycerol. If the delivery form is lyophilized powder, the buffer before lyophilization is Tris/PBS-based buffer, 6% Trehalose.
Product Type	Recombinant Protein
Immunogen Species	Homo sapiens (Human)
Purity	Greater than 85% as determined by SDS-PAGE.
Sequence	GMGCSSPPCECHQEEDFRVTCKDIQRIPSLPPSTQTLKLIETHLRTIPSHAFSN LPNISRIYVSIDVTLLQQLSHSFYNLSKVTHIEIRNTRNLTYIDPDALKELPLLKFL GIFNTGLKMFDPDLTKVYSTDIFFILEITDNPYMTSIPVNAFQGLCNETLTLKLYNN GFTSVQGYAFNGTKLDAVYLNKNKYLTVIDKDAFGGVYSGPSLLDVSQTSVTA LPSKGLEHLKELIARNTWTLKKLPLSLSFLHLTRADLSYP SHCCAFKNQKKIRGI LESLMCNESSMQSLRQRKSVNALNSPLHQEYEENLGDSIVGYKEKSKFQDTH NNAHYVVFEEQEDEIIGFGQELKNPQEETLQAFDSHYDYTCGDSEDMVCTP KSDEFNPCEDIMG
Research Area	Neuroscience
Source	Baculovirus
Target Names	TSHR
Expression Region	21-413aa
Notes	Repeated freezing and thawing is not recommended. Store working aliquots at 4°C for up to one week.
Tag Info	C-terminal 10xHis-tagged
Mol. Weight	48.7 kDa
Protein Length	Partial
Image	



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

Description

The recombinant human TSHR protein is produced by cloning the TSHR gene with the C-terminal 10xHis tag gene into an expression vector. After transformation into baculovirus, the vectors are induced to express as TSHR protein using IPTG. The recombinant TSHR protein is extracted and purified by Ni-NTA affinity chromatography. The His tag on the protein allows for selective binding to nickel ions, ensuring efficient purification. The TSHR protein is then analyzed via SDS-PAGE, showing a purity level of over 90%.

The human TSHR is a critical component of the hypothalamic-pituitary-thyroid (HPT) axis, functioning primarily as a GPCR that mediates the effects of thyroid-stimulating hormone (TSH) on thyroid follicular cells [1][2]. TSHR is predominantly expressed in the thyroid gland, where it plays a pivotal role in regulating thyroid hormone synthesis and secretion.

The activation of TSHR by TSH initiates a cascade of intracellular signaling pathways, primarily involving the Gs and Gq proteins, which lead to the production of cAMP and the mobilization of intracellular calcium, respectively. This signaling is crucial for the synthesis of thyroid hormones, T3 and T4, which are essential for metabolic regulation [3][4]. Dysregulation of TSHR signaling is implicated in several thyroid disorders, particularly autoimmune conditions such as Graves' disease, where autoantibodies against TSHR stimulate excessive thyroid hormone production, resulting in hyperthyroidism [5-7]. Mutations in the TSHR gene can lead to congenital hypothyroidism and other thyroid dysgenesis syndromes, underscoring the receptor's critical role in thyroid development and function [12].

References:

- [1] J. Morillo-Bernal, J. Fernández-Santos, J. Utrilla, M. Miguel, R. García-Marín, & I. Martín-Lacave, Functional expression of the thyrotropin receptor in c cells: new insights into their involvement in the hypothalamic?pituitary?thyroid axis, *Journal of Anatomy*, vol. 215, no. 2, p. 150-158, 2009. <https://doi.org/10.1111/j.1469-7580.2009.01095.x>
- [2] A. Haas, G. Kleinau, I. Hoyer, S. Neumann, J. Furkert, C. Rutz, et al. Mutations that silence constitutive signaling activity in the allosteric ligand-binding site of the thyrotropin receptor, *Cellular and Molecular Life Sciences*, vol. 68, no. 1, p. 159-167, 2010. <https://doi.org/10.1007/s00018-010-0451-2>
- [3] X. Cheng, Receptor modulators associated with the hypothalamus -pituitary-



thyroid axis, *Frontiers in Pharmacology*, vol. 14, 2023.

<https://doi.org/10.3389/fphar.2023.1291856>

[4] B. Faust, I. Singh, K. Zhang, N. Hoppe, A. Pinto-Duarte, Y. Muftuoglu, et al. Autoantibody and hormone activation of the thyrotropin g protein-coupled receptor, 2022. <https://doi.org/10.1101/2022.01.06.475289>

[5] A. Budavari, M. Whitaker, & R. Helmers, Thymic hyperplasia presenting as anterior mediastinal mass in 2 patients with graves disease, *Mayo Clinic Proceedings*, vol. 77, no. 5, p. 495-499, 2002. <https://doi.org/10.4065/77.5.495>

[6] M. Ahmed, Outcomes of long-term follow-up of patients receiving antithyroid medication for hyperthyroidism due to graves' disease, *The Scientific Journal of Medical Scholar*, p. 54-63, 2023. <https://doi.org/10.55675/sjms.v2i2.47>

[7] M. Jin, A. Jang, C. Kim, T. Kim, W. Kim, Y. Shong, et al. Long-term follow-up result of antithyroid drug treatment of graves' hyperthyroidism in a large cohort, *European Thyroid Journal*, vol. 12, no. 2, 2023.

<https://doi.org/10.1530/etj-22-0226>

[8] M. Castanet, S. Sura-Trueba, A. Chauty, A. Carré, N. Roux, S. Heath, et al. Linkage and mutational analysis of familial thyroid dysgenesis demonstrate genetic heterogeneity implicating novel genes, *European Journal of Human Genetics*, vol. 13, no. 2, p. 232-239, 2004.

<https://doi.org/10.1038/sj.ejhg.5201321>

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.