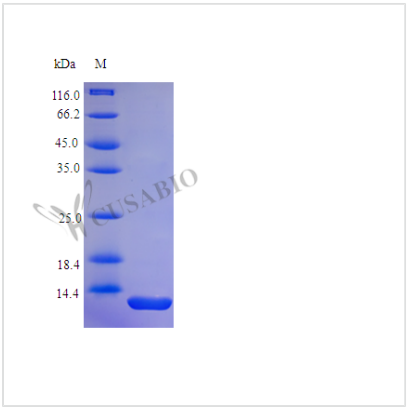
Recombinant Human Parathyroid hormone protein (PTH) (Active)

Product Code	CSB-AP000051HU
Abbreviation	Recombinant Human PTH protein (Active)
Uniprot No.	P01270
Form	Lyophilized powder
Storage Buffer	Lyophilized from a 0.2 μm filtered PBS, pH 7.4
Product Type	Hormone
Immunogen Species	Homo sapiens (Human)
Biological Activity	Fully biologically active when compared to standard. The ED50 as determined by its ability to induce cAMP accumulation in murine MC3T3E1 cells is less than 50 ng/ml, corresponding to a specific activity of >2.0x10^4 IU/mg.
Purity	>97% as determined by SDS-PAGE.
Sequence	SVSEIQLMHN LGKHLNSMER VEWLRKKLQD VHNFVALGAP LAPRDAGSQR PRKKEDNVLV ESHEKSLGEA DKADVNVLTK AKSQ
Research Area	Signal Transduction
Source	E.coli
Target Names	PTH
Expression Region	32-115aa
Notes	Repeated freezing and thawing is not recommended. Store working aliquots at 4°C for up to one week.
Tag Info	Tag-Free
Mol. Weight	9.4 kDa
Protein Length	Full Length of Mature Protein
PubMed ID	6950381; 6220408; 15489334; 7829495; 4833516; 15340161; 4521809; 728431; 1125201; 4474131; 4721748; 21076856; 2069952; 8344299; 7797503; 10623601; 10837469; 18375760; 2212001; 10523031; 18056632
Image	



Description

The gene fragment encoding the 32-115aa of the human parathyroid hormone protein (PTH) is inserted into an expression vector to produce a recombinant plasmid. The recombinant plasmid is transfected into E. coli cells, which are cultured to induce the expression of the target protein. The culture supernatant is harvested and purified via affinity chromatography to obtain the recombinant human PTH protein, achieving over 97% purity as confirmed by SDS-PAGE. This recombinant PTH protein has been validated to be biologically active. It induced cAMP accumulation in murine MC3T3E1 cells, with the ED50 less than 50 ng/ml corresponding to a specific activity of >2.0x104 IU/mg. Its endotoxin content is less than 1.0 EU/μg as measured by the LAL method.

Human PTH is a critical polypeptide hormone that plays a vital role in regulating calcium and phosphate homeostasis in the body. It is synthesized and secreted by the chief cells of the parathyroid glands, primarily in response to low serum calcium levels. PTH exerts its effects by binding to specific receptors, primarily the PTH1R, which activates various signaling pathways that influence bone metabolism and renal function [1].

PTH promotes the mobilization of calcium from bones, enhances renal tubular reabsorption of calcium, and stimulates the conversion of vitamin D into its active form, calcitriol, which increases intestinal absorption of calcium [1]. Additionally, PTH has been shown to have anabolic effects on bone when administered intermittently, leading to increased bone mass and strength, particularly in populations at risk for osteoporosis [2][3]. This anabolic action is mediated by stimulating osteoblasts, the cells responsible for bone formation [2].

PTH is also implicated in various pathological conditions, particularly in chronic kidney disease (CKD) and primary hyperparathyroidism. In CKD, the inability of the kidneys to excrete phosphate leads to secondary hyperparathyroidism, characterized by elevated levels of PTH as the body attempts to maintain calcium homeostasis [4][5]. This condition can result in bone disease and cardiovascular complications due to the dysregulation of calcium and phosphate metabolism [4]. Furthermore, studies have indicated that elevated PTH levels may correlate with increased cardiovascular risks, highlighting the hormone's systemic implications beyond bone health [4].

References:

[1] A. Pioszak and H. Xu, Molecular recognition of parathyroid hormone by its g

protein-coupled receptor, Proceedings of the National Academy of Sciences, vol. 105, no. 13, p. 5034-5039, 2008. https://doi.org/10.1073/pnas.0801027105
[2] R. Jilka, Molecular and cellular mechanisms of the anabolic effect of intermittent pth, Bone, vol. 40, no. 6, p. 1434-1446, 2007. https://doi.org/10.1016/j.bone.2007.03.017
[3] R. Jilka, C. O'Brien, A. Ali, P. Roberson, R. Weinstein, & S. Manolagas, Intermittent pth stimulates periosteal bone formation by actions on post-mitotic preosteoblasts, Bone, vol. 44, no. 2, p. 275-286, 2009. https://doi.org/10.1016/j.bone.2008.10.037
[4] H. Fujii, Association between parathyroid hormone and cardiovascular disease, Therapeutic Apheresis and Dialysis, vol. 22, no. 3, p. 236-241, 2018. https://doi.org/10.1111/1744-9987.12679
[5] S. Herawati, Y. Kandarini, & I. Prabawa, The correlation between estimated glomerular filtration rate and parathyroid hormone levels in predialysis-chronic kidney disease adult patients at sanglah general hospital, bali, indonesia, Open Access Macedonian Journal of Medical Sciences, vol. 9, no. B, p. 470-474, 2021. https://doi.org/10.3889/oamjms.2021.6097

Endotoxin	Less than 1.0 EU/μg as determined by LAL method.
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.