

Product Information

Parathyroid Hormone (1-84), Human

Recombinant, expressed in *E. coli***SAE0192**

Product Description

Synonyms: Parathyrin, PTH, Parathormone

Parathyroid hormone (PTH) is secreted by the parathyroid glands as a polypeptide of 84 amino acids. PTH acts to increase calcium concentration in the blood,¹⁻³ whereas calcitonin (a hormone produced by the parafollicular cells of the thyroid gland) acts to decrease calcium concentration. PTH acts to increase calcium concentration in the blood by acting upon PTH receptor in three parts of the body:

- In the bones: PTH enhances the release of calcium from the large reservoir contained in the bones. Bone resorption is the normal destruction of bone by osteoclasts, which are indirectly stimulated by PTH. Stimulation is indirect since osteoclasts do not have a receptor for PTH. Instead, PTH binds to osteoblasts, the cells responsible for creating bone. Binding stimulates osteoblasts to increase their expression of RANKL, which can bind to osteoclast precursors containing RANK, a receptor for RANKL. The binding of RANKL to RANK stimulates these precursors to fuse, forming new osteoclasts which ultimately enhances the resorption of bone.
- In the kidney: PTH enhances active reabsorption of calcium from distal tubules and the thick ascending limb.
- In the intestine: PTH enhances calcium absorption in the intestine by increasing the production of 1,25-dihydroxy vitamin D via upregulation of 25-hydroxyvitamin D-1 α -hydroxylase, the enzyme responsible for 1-alpha hydroxylation of 25-hydroxy vitamin D.^{4,5} The overall process affects the actual absorption of calcium (as Ca²⁺ ions) by the intestine via calbindin.

Recombinant Human full length PTH 1-84 has been investigated in anti-osteoporotic research, because of its properties as a bone formation stimulant.⁶ This increases bone turnover, stimulating osteoblasts and reducing both vertebral and non-vertebral fractures.

Precautions and Disclaimer

For R&D use only. Not for drug, household, or other uses. Please consult the Safety Data Sheet for information regarding hazards and safe handling practices.

Reagent

Parathyroid Hormone 1-84 (full length) Human Recombinant produced in *E. coli* is a single, non-glycosylated, polypeptide chain that contains 84 amino acids (MW of ~9.4 kDa), with the following amino acid sequence:

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SVSEIQLMHN LGKHLNSMER VEWLRKKLQD  
VHNFVALGAP LAPRDAGSQR PRKKEDNVLV  
ESHEKSLGEA DKADVNVLTAK AKSQ
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The product is supplied as lyophilized powder, from a 0.2 μ m filtered concentrated solution in PBS (pH 7.4).

Storage/Stability

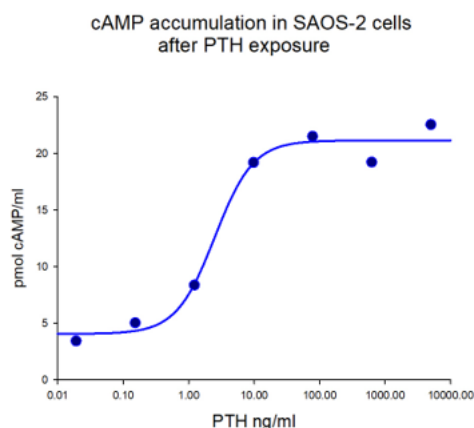
Store this product at -20 °C.

Preparation Instructions

- It is recommended to reconstitute the lyophilized PTH in ultrapure water, at not less than 100 μ g/mL. Such a stock solution can then be further diluted into other aqueous solutions.
- Upon reconstitution, PTH should be stored at:
 - 2-8 °C for up to 7 days, for short-term use
 - -20 °C for long-term future use
- For long-term storage, it is recommended to add a carrier protein (such as 0.1% HSA or BSA).
- Avoid freeze-thaw cycles.

Activity

The biological activity of this recombinant human PTH (1-84) product is demonstrated by its ability to stimulate increase of cellular cAMP levels in human bone osteosarcoma SAOS-2 cells that have been differentiated to an osteoblastic phenotype by exposure to dexamethasone,^{7,8} such as shown in the following figure.



The SAOS-2 cells were exposed to increasing concentrations of PTH for 5 minutes at 37 °C. Cellular cAMP concentration was measured using the cAMP Enzyme Immunoassay kit (Catalogue Number CA201).

References

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