9051 Mira Mesa Blvd, #910094
San Diego, CA 92191
Tel: 760-390-3989

FGF23 Human

Fibroblast Growth Factor-23 Human Recombinant
GRF0100

Product Overview

Name	FGF23 Human
Description	
Fibroblast Growth Factor-23 Human Recombinant	
Accession (Primary)	Q9GZV9
Synonyms	
Tumor-derived hypophosphatemia-inducing factor, HYPF, ADHR, HPDR2, PHPTC, FGF23, FGF-23, Fibroblast Growth Factor-23.	
Introduction	
FGF-23 is a member of the fibroblast growth factor (FGF) family. FGF family members possess broad mitogenic and cell survival activities and are involved in a variety of biological processes including embryonic development, cell growth, morphogenesis, tissue repair, tumor growth and invasion. FGF-23 inhibits renal tubular phosphate transport. The FGF-23 gene was identified by its mutations associated with autosomal dominant hypophosphatemic rickets (ADHR), an inherited phosphate wasting disorder. Abnormally high level expression of FGF-23 was found in oncogenic hypophosphatemic osteomalacia (OHO), a phenotypically similar disease caused by abnormal phosphate metabolism. FGF-23 mutations have also been shown to cause familial tumoral calcinosis with hyperphosphatemia.	
Source	
Escherichia Coli.	
Physical Appearance	
Sterile Filtered white lyophilized powder.	
Formulation	
The FGF-23 protein (0.5mg/ml) was lyophilized from a 0.2 μm filtered concentrated solution in PBS, pH 7.4.	
Stability	
Lyophilized FGF-23 although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution FGF-23 should be stored at 4°C between 2-7 days and for future use below -18°C. For long term storage it is recommended to add a carrier protein (0.1% HSA or BSA). Please prevent freeze-thaw cycles.	
Purity	
Greater than 95.0% as determined by SDS-PAGE.	
Amino acid sequence	

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MYPNASPLLG SSWGGLIHLY TATARNSYHL QIHKNGHVDG APHQTIYSAL MIRSEDAGFV VITGVMSRRY LCMDFRGNIF GSHYFDPENC RFQHQTLENG YDVYHSPQYH FLVSLGRAKR AFLPGMNPPP YSQFLSRRNE IPLIHFNTPI PRRHTRSAED DSERDPLNVL KPRARMTPAP ASCSQELPSA EDNSPMASDP LGVVRGGRVN THAGGTGPEG CRPFAKFI.

Biological Activity

The biological activity of FGF-23 was measured in a cell proliferation assay using NIH/3T3 mouse embryonic fibroblasts. The ED50 for this effect is typically 0.05-0.5 µg/ml in the presence of 5 µg/ml of Recombinant Mouse Klotho and 10 µg/ml of HPR.

Solubility

It is recommended to reconstitute the lyophilized FGF-23 in sterile 18M-cm H2O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

Background

Before it was discovered in 2000, there was a hypothesis that a similar type of protein existed that performed many of the functions we see in FGF23. This was originally referred to as phosphatonin. Various effects were described and noted by researchers including inhibition of production and inhibition of secretion of parathyroid hormone. Derived from the bone Fibroblast Growth Factor 23 is a phosphaturic hormone. It increases phosphate excretion when acting on the kidney and also suppresses the biosynthesis of 1,25(OH)2D3. Mechanism Despite various research studies into the topic, many of the mechanisms for the regulations of FGF23 production remain a mystery to the scientific community. While we know that mutations in PHEX, ENPP1 and DMP1 result in the increased expression of FGF23, it is unclear why this occurs. This also means that currently, it is not possible to regulate the production of FGF23 either. We also do not know how signals from FGF23 regulate vitamin D metabolism. However, understanding these types of mechanisms could offer information needed to provide better treatment for deranged bone and mineral metabolism. Interactions Molecular interactions involving FGF-23, vitamin D and klotho do provide the solution needed to regulate phosphate levels within the body. Furthermore, an interaction between Vitamin D and FGF3 can have an impact on renal phosphate balance. As well as this, when in the presence of klotho, FGF3 does actually increase bioactivity and begins to change systemic phosphate homeostasis. Function Based on research it seems that the main function for FGF23 is the regulation of phosphate concentration in plasma. It seems to be secreted from the osteocytes due to elevated levels . When acting upon the kidneys, the hormone reduces the expression of NPT2. This is a sodium-phosphate cotransporter found in the proximal tube. As such, it appears as though FGF23 is able to reduce the reabsorption, all the while maxing the excretion of phosphate. It has also been suggested that the hormone is able to suppress 1-alpha-hydroxylase. If this is the case, it can limit its potential to activate vitamin D and thus impair the ability for calcium absorption. Structure FGF243 is located on the chromosome 12. It is composed of three exons. The crystal structure of FGF23 is completely different from the common conformation typically adopted by paracrine-acting FGFs. Instead, there is a conformation of the HPR region between beta strands 10 and 12. As well as this, there is a cleft between the other HPR-binding region, the beta1-beta12 loop and this one. This comes before a direct interaction between HPR sulfate and FGF23s backbone atoms. Due to this, endocrine function is benefitted and HPR-binding

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affinity is reduced for the lipangs. Certain mutations that cause the protein to be completely resistant to proteolytic cleavage does trigger a surge in activity of the protein and the renal phosphate loss typically found in certain human diseases including hypophosphatemic rickets. Studies have also revealed that FGF23 is overproduced in certain tumors including phosphaturic mesenchymal tumors. Furthermore a reduced level of activity for this protein is believed to lead to higher phosphate levels and familial tumor calcinosis clinical syndrome.

References

Title: Leptin stimulates fibroblast growth factor 23 expression in bone and suppresses renal 1?,25-dihydroxyvitamin D3 synthesis in leptin-deficient ob/ob Mice Publication: Journal of bone and mineral research 25.8 (2010): 1711-1723.
Link: FGF23 prospec publication

Precautions

FGF23 Human is for research use only and not for use in diagnostic or therapeutic procedures.

Target Information: (Q9GZV9)

Background

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References for protein:

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