

DESCRIPTION

Source Mouse myeloma cell line, NS0-derived
Tyr25-Val251 (Arg179Gln), with a C-terminal 6-His tag
Accession # Q9EPC2

N-terminal Sequence Analysis Tyr25

Predicted Molecular Mass 26.1 kDa

SPECIFICATIONS

SDS-PAGE 30-32 kDa, reducing conditions

Activity Measured in a cell proliferation assay using BaF3 mouse pro-B cells transfected with human FGF RIIIc.
The ED₅₀ for this effect is typically 0.2-1.2 µg/mL in the presence of rmKlotho (Catalog # 1819-KL) and heparin.

Measured in a cell proliferation assay using NIH-3T3 mouse embryonic fibroblast cells.
The ED₅₀ for this effect is typically 0.3-1.5 µg/mL in the presence of 10 µg/mL of rmKlotho (R&D Systems, Catalog # 1819-KL) and 10 µg/mL of heparin.

Endotoxin Level <1.0 EU per 1 µg of the protein by the LAL method.

Purity >95%, by SDS-PAGE under reducing conditions and visualized by silver stain.

Formulation Lyophilized from a 0.2 µm filtered solution in MOPS, Na₂SO₄, EDTA and DTT. See Certificate of Analysis for details.

PREPARATION AND STORAGE

Reconstitution Reconstitute at 100 µg/mL in sterile PBS.

Shipping The product is shipped at ambient temperature. Upon receipt, store it immediately at the temperature recommended below.

Stability & Storage Use a manual defrost freezer and avoid repeated freeze-thaw cycles.

- 12 months from date of receipt, -20 to -70 °C as supplied.
- 1 month, 2 to 8 °C under sterile conditions after reconstitution.
- 3 months, -20 to -70 °C under sterile conditions after reconstitution.

BACKGROUND

Fibroblast growth factor 23 (FGF-23) is a 30 - 32 kDa member of the FGF gene family. Based on its structure, it is further classified as an FGF19 subfamily member. This subfamily includes FGF-19, -21, and -23. Like all other FGF subfamilies, FGF-19 subfamily members contain a 120 amino acid (aa) core FGF domain that exhibits a β-trefoil structure (1, 2). Unlike other FGF subfamilies, FGF-19 subfamily members exist as highly diffusible molecules that is attributed to poor ECM/heparin sulfate binding (3, 4, 5, 6). The cDNA for mouse FGF-23 predicts a 251 aa polypeptide that contains a 24 aa signal sequence and a 227 aa mature region (7). Mature mouse FGF-23 shows 72% aa identity to human FGF-23 (8). The FGF-19 subfamily shares an unusual receptor configuration. The standard model for FGF signaling requires an FGF:FGFR:heparin sulfate complex. Given FGF-23's minimal association with heparin, a substitute termed (α-) Klotho has evolved that serves the same function. Although FGF-23 binds to the widely expressed "c" isoforms of FGFR1 and 3 plus FGFR4, Klotho has a restricted distribution that limits FGF-23 activity (10, 11, 12). It should be noted that heparin-dependency has been reported for FGF-19 signaling, and this observation may extend to FGF-23 (13). The FGF-19 subfamily is considered endocrine in nature. All three subfamily members impact some aspect of metabolism and all three are induced by a nuclear receptor heterodimer that includes the retinoid X receptor (14, 15, 16). FGF-23 is considered a phosphatonin; that is, a molecule that reduces circulating plasma phosphate. It is produced by osteocytes and osteoblasts in response to high circulating phosphate levels, elevated parathyroid hormone that induces hypercalcemia, and circulatory volume loading. Upon binding to FGF-23 receptors on renal proximal tubular epithelium, two basic changes are seen. First, the enzyme responsible for generating the active form of vitamin D is suppressed, resulting in decreased levels of bioactive vitamin D. Since vitamin D promotes intestinal phosphate absorption, plasma phosphate declines. Second, the transporters responsible for phosphate resorption on renal epithelium are down regulated, resulting in decreased uptake from urine and again a decline in blood phosphorus (17, 18).

References:

1. Itoh, N. and D.M. Ornitz (2004) Trends Genet. **20**:563.
2. Mohammadi, M. *et al.* (2005) Cytokine Growth Factor Rev. **16**:107.
3. Fukumoto, S. (2007) Endocr. J. Sep 14; [Epub ahead of print].
4. Huang, X. *et al.* (2006) Mol. Carcinog. **45**:934.
5. Goetz, R. *et al.* (2007) Mol. Cell. Biol. **27**:3417.
6. Harmer, N.J. *et al.* (2004) Biochemistry **43**:629.
7. Yamashita, T. *et al.* (2000) Biochem. Biophys. Res. Commun. **277**:494.
8. Shimada, T. *et al.* (2001) Proc. Natl. Acad. Sci. USA **98**:6500.
9. Kato, K. *et al.* (2006) J. Biol. Chem. **281**:18370.
10. Zhang, X. *et al.* (2006) J. Biol. Chem. **281**:15694.
11. Urakawa, I. *et al.* (2006) Nature **444**:770.
12. Hurosu, H. *et al.* (2006) J. Biol. Chem. **281**:6120.
13. Wu, X. *et al.* (2007) J. Biol. Chem. **282**:29069.
14. Moore, D.D. (2007) Science **316**:1436.
15. Ogawa, Y. *et al.* (2007) Proc. Natl. Acad. Sci. USA **104**:7432.
16. Kurosu, H. *et al.* (2007) J. Biol. Chem. **282**:26687.
17. Razzaque, M.S. and B. Lanske (2007) J. Endocrinol. **194**:1.
18. Liu, S. *et al.* (2007) Curr. Opin. Nephrol. Hypertens. **16**:329.