

## DESCRIPTION

**Source** Mouse myeloma cell line, NS0-derived  
Lys25-Asp184, with a C-terminal 10-His tag  
Accession # O70326

**N-terminal Sequence Analysis** Lys25

**Predicted Molecular Mass** 19.6 kDa

## SPECIFICATIONS

**SDS-PAGE** 23-31 kDa, reducing conditions

**Activity** Measured by its ability to inhibit alkaline phosphatase production by MC3T3-E1 mouse preosteoblast cells.  
The ED<sub>50</sub> for this effect is 0.025-0.15 µg/mL in the presence of 30 ng/mL of Recombinant Human BMP-4 (Catalog # 314-BP).

**Endotoxin Level** <0.10 EU per 1 µg of the protein by the LAL method.

**Purity** >90%, by SDS-PAGE visualized with Silver Staining and quantitative densitometry by Coomassie® Blue Staining.

**Formulation** Lyophilized from a 0.2 µm filtered solution in Acetonitrile and TFA with BSA as a carrier protein. See Certificate of Analysis for details.

## PREPARATION AND STORAGE

**Reconstitution** Reconstitute at 250 µg/mL in sterile 4 mM HCl containing at least 0.1% human or bovine serum albumin.

**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

Gremlin was identified in a *Xenopus* expression-cloning screen as a dorsalizing factor that can induce a secondary axis. A rat homolog, called Drm, was identified as a cDNA that was downregulated in v-mos transfected cells. Gremlin/Drm belongs to the DAN family of secreted glycoproteins that are BMP antagonists. Other members of the family include: cerberus, Dante, PRDC, caronte and DAN. DAN family members share a cysteine-rich domain that is structurally related to the cysteine-knot motif found in TGF-β superfamily ligands. In vitro, Gremlin/Drm binds BMP-4 and BMP-2 indicating that it might interfere with BMP signaling. Gremlin/Drm acts as a BMP-2/4 antagonist in a variety of tissues and developmental processes including: *Xenopus* animal cap explants, chick limb bud outgrowth and chondrogenesis, murine lung branching morphogenesis, and osteogenic differentiation of mouse myoblasts and bone marrow stromal cells. In addition, expression of Gremlin/Drm has been shown to be downregulated in a wide range of human cancer cell lines. Mouse, human, chick and *Xenopus* homologs of Gremlin share over 80% amino acid identity. It is likely that various DAN family members and other BMP antagonists including Noggin, Chordin, Follistatin and TSG can selectively antagonize the activities of different subsets of TGF-β superfamily ligands.

## References:

1. Hsu, D.R. *et al.* (1998) Mol. Cell 1:673.
2. Merino, R. *et al.* (1999) Development 126:5515.
3. Shi, W. *et al.* (2001) Am. J. Physiol. Lung Cell Mol. Physiol. 280:L1030.
4. Topol, L.Z. *et al.* (2000) J. Biol. Chem. 275:8785.