

**DESCRIPTION**

**Source** Chinese Hamster Ovary cell line, CHO-derived  
Ala251-Gly364  
Accession # Q9NR23

**N-terminal Sequence Analysis** Ala251

**Predicted Molecular Mass** 12.9 kDa

**SPECIFICATIONS**

**SDS-PAGE** 18 kDa, reducing conditions

**Activity** Measured by its ability to induce Smad2 phosphorylation in P19 mouse embryonal carcinoma cells. Mazerbourg, S. *et al.* (2004) Mol. Endocrinol. **18**:653.  
50 ng/mL of Recombinant Human GDF-3 can effectively induce Smad2 phosphorylation.

**Endotoxin Level** <1.0 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 HCl. See Certificate of Analysis for details.

**PREPARATION AND STORAGE**

**Reconstitution** Reconstitute at 100 µg/mL in 4 mM HCl..

**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**

GDF-3 (previously called Vgr-2) is a TGF-β superfamily member belonging to the growth/differentiation factor family (1, 2). GDF-3 is expressed in undifferentiated embryonic stem (ES) cells, white adipose tissue and the brain (2-4). The 366 amino acid (aa) mouse GDF-3 contains a 22 aa signal sequence, a 230 aa propeptide and a 114 aa mature protein that contains one potential N-glycosylation site. The mature region contains a cysteine-knot structure that is conserved throughout family members. However, it lacks the fourth cysteine which is responsible for the formation of an inter-molecular disulfide bond, so GDF-3 may exist as a non-covalent homodimer (2, 5). Mature human GDF-3 shares 83%, 83% aa sequence identity with mouse and rat GDF-3. Most of GDF-3 is present as the uncleaved prepro form (6). The uncleaved and the mature forms both appear to have activity, but that activity may differ (5-8). All forms can oppose BMPs. In ES cells, inhibition of BMP2 signaling by GDF-3 maintains pluripotency (5, 7). GDF-3 also influences early cell fate decisions; for example, deletion of mouse GDF-3 produces defects in the anterior visceral endoderm of the pre-gastrulation embryo (6-8). GDF-3 cooperates with GDF-1 in embryogenesis, and the mature protein has nodal-like activity (8, 9). Although GDF family members signal through BMP receptors (ALK1, 2, 3 and 6), which activate Smads 1, 5 and 8, GDF-3 signaling through ALK4 and ALK7, which activate Smads 2 and 3, has also been reported (9, 10). In adipocytes, GDF-3 is induced by a high fat diet, promoting adipogenesis and obesity (3, 10, 11).

**References:**

1. Levine, A.J. and A.H. Brivanlou (2006) Cell Cycle **5**:1069.
2. Caricasole, A.A. *et al.* (1998) Oncogene **16**:95.
3. Wang, W. *et al.* (2004) Biochem. Biophys. Res. Comm. **321**:1024.
4. Hexige, S. *et al.* (2005) Neurosci. Lett. **389**:83.
5. Levine, A.J. *et al.* (2009) Dev. Biol. **325**:43.
6. Levine, A.J. and A.H. Brivanlou (2005) Development **133**:209.
7. Peerani, R. *et al.* (2007) EMBO J. **26**:4744.
8. Chen, C. *et al.* (2006) Development **133**:319.
9. Andersson, O. *et al.* (2007) Dev. Biol. **311**:500.
10. Andersson, O. *et al.* (2008) Proc. Natl. Acad. Sci. USA **105**:7252.
11. Shen, J.J. *et al.* (2009) Mol. Endocrinol. **23**:113.