

DESCRIPTION

Source *E. coli*-derived
His245-Leu354, with an N-terminal Met
Accession # P43021

N-terminal Sequence Analysis Met

Structure / Form Disulfide-linked homodimer

Predicted Molecular Mass 13 kDa (monomer)

SPECIFICATIONS

Activity Measured by its ability to induce Smad2 phosphorylation in P19 mouse embryonal carcinoma cells. Yeo, C. *et al.* (2001) *Mol. Cell.* 7:949. Approximately 100 ng/mL of Recombinant Mouse Nodal can effectively induce Smad2 phosphorylation.

Endotoxin Level <0.01 EU per 1 µg of the protein by the LAL method.

Purity >97%, by SDS-PAGE under reducing conditions and visualized by silver stain.

Formulation Lyophilized from a 0.2 µm filtered solution in Acetonitrile and TFA. See Certificate of Analysis for details.

PREPARATION AND STORAGE

Reconstitution Reconstitute at 100 µg/mL in sterile 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

Nodal is a secreted protein that is a member of the Transforming Growth Factor-β (TGF-β) superfamily. Nodal was named for its localized expression in the mouse node during gastrulation, and is first detected in the early primitive streak during mesoderm formation. Expression of the Nodal gene occurs asymmetrically in the left, but not right, lateral plate during somitogenesis. Nodal proteins play crucial roles in mesoderm formation and both anterior-posterior and left-right axis formation during vertebrate development. Members of the Nodal gene family include mouse Nodal, chick cNR-1, frog Xnr1-4, and zebrafish cyclops. Biologically active Nodal is a disulfide-linked homodimer and contains all seven of the cysteine residues necessary for formation of the "cysteine knot" characteristic of TGF-β-related molecules. Mouse Nodal is 34 - 39% homologous in the conserved region to other TGF-β superfamily members. Nodal has been shown to signal through a mechanism related to the Activin pathway, and signaling is mediated through both Smad2 and 3. Nodal signaling utilizes type II Activin receptors, together with ALK4/ActRIB, or the orphan type I receptor ALK7. Nodal interacts extracellularly with members of other protein families, including Cerberus, Lefty, and EGF-CFC ligands, such as Cripto. While the Cerberus and Lefty families act as Nodal antagonists, the EGF-CFC molecules act as co-receptors to facilitate Nodal signaling. The resulting concert of regulated Nodal activity allows for the precise control of mesoderm formation, neural patterning, and axis positioning and patterning during early vertebrate development.

References:

1. Kumar, A. *et al.* (2001) *J. Biol. Chem.* **276**:656.
2. Reissmann, E. *et al.* (2001) *Genes & Dev.* **15**: 2010.
3. Schier, A. and M. Shen (1999) *Nature* **403**:385.
4. Zhou, X. *et al.* (1993) *Nature* **361**:543.