

DESCRIPTION

Source	<i>E. coli</i> -derived Cys24-Gly197, with a C-terminal 6-His tag Accession # Q15465
N-terminal Sequence Analysis	Cys24
Predicted Molecular Mass	20 kDa

SPECIFICATIONS

SDS-PAGE	23 kDa, reducing conditions
Activity	Measured by its ability to induce alkaline phosphatase production by C3H10T1/2 mouse embryonic fibroblast cells. Nakamura, T. <i>et al.</i> (1997) <i>Biochem. Biophys. Res. Commun.</i> 237 :465. The ED ₅₀ for this effect is typically 1–5 µg/mL.
Endotoxin Level	<1.0 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 NaH ₂ PO ₄ , NaCl and DTT with BSA as a carrier protein. See Certificate of Analysis for details.

PREPARATION AND STORAGE

Reconstitution	Reconstitute at 100 µg/mL in sterile PBS 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. <ul style="list-style-type: none"> ● 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

The *hedgehog* (*hh*) gene encoding a secreted protein was originally identified in *Drosophila* as a segment polarity gene. The vertebrate homologues of Hh comprise several proteins including sonic hedgehog (Shh), Indian hedgehog (Ihh), and Desert hedgehog (Dhh). Hedgehog proteins are important signaling molecules during embryonic development. Shh genes are highly conserved and have been identified in a variety of species including human, mouse, frog, fish, and chicken. Mouse and human Shh are 92% identical at the amino acid sequence level. Shh is expressed in key embryonic tissues such as the Hensen's node, the zone of polarizing activity in the posterior limb bud, the notochord, and the floor plate of the neural tube. Shh is involved in regulating the patterning of the developing central nervous system, somite, and limb. Shh plays an important role in the development of particular tissues such as whisker, hair, foregut, tooth and bone. Evidence also suggests that Shh is involved in regulating stem cell fates of neural and hematopoietic lineages, and that aberrant Shh signaling is implicated in basal cell carcinomas and other diseases.

Human Shh cDNA encodes a 45 kDa precursor protein. An autocatalytic reaction yields a 19 kDa amino-terminal domain Shh-N protein containing cholesterol and palmitate, and a 25 kDa carboxy-terminal domain Shh-C protein. The N-terminal domain retains all known signaling capabilities, while the C-terminal domain is responsible for the intramolecular processing, acting as a cholesterol transferase. Shh can act as both a short-range contact dependent factor and as a long-range, diffusible morphogen. At the cell surface, Shh activity is mediated by a multicomponent receptor complex involving the 12-pass transmembrane protein Patched (Ptc) which binds Shh with high affinity and Smoothened (Smo), a signaling seven transmembrane G-protein coupled receptor. In the absence of Shh, Ptc represses Smo activity. The binding of Shh to Ptc, releases the basal repression of Smo by Ptc (1 - 5).

References:

1. Carpenter, D. *et al.* (1998) *Proc. Natl. Acad. Sci. USA* **95**:13630.
2. Perrimon, N. (1995) *Cell* **80**:517.
3. Weed, M. *et al.* (1997) *Matrix Biol.* **16**:53.
4. Mullor, J. *et al.* (2002) *Trends Cell Biol.* **12**:562.
5. Ingham, P. and A. McMahon (2001) *Genes & Dev.* **15**:3059.