

DESCRIPTION

Source	Mouse myeloma cell line, NS0-derived		
	Mouse Hip (Lys24 - Arg678 & Asp52 - Arg678) Accession # AAD31172	IEGRMDGGGSGGGSGGGS	10-His tag
	N-terminus		C-terminus
N-terminal Sequence Analysis	Lys24 & Asp52		
Predicted Molecular Mass	76 kDa and 73 kDa		

SPECIFICATIONS

SDS-PAGE	80-90 kDa and 58-64 kDa, reducing conditions
Activity	Measured by its ability to inhibit Sonic Hedgehog (Shh) induction of alkaline phosphatase production in C3H10T1/2 mouse embryonic fibroblast cells. The ED ₅₀ for this effect is typically 1.5-7.5 µg/mL in the presence of 5 µg/mL rmShh.
Endotoxin Level	<1.0 EU per 1 µg of the protein by the LAL method.
Purity	>90%, by SDS-PAGE under reducing conditions and visualized by silver stain.
Formulation	Lyophilized from a 0.2 µm filtered solution in PBS. 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. <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

Hedgehog signaling proteins act as mitogens, morphogens, or inducing factors in many different cell types during embryonic development. They aid in growth, patterning, and morphogenesis in both vertebrates and insects (1). Hip (Hedgehog-interacting protein) is a type I transmembrane protein identified for its ability to bind biologically active Sonic Hedgehog. It is comprised of 700 amino acids (aa) and includes a hydrophobic signal sequence, two EGF-like domains near the C-terminus, and a 22 aa membrane-spanning region at the C-terminal end (2). Hip has only been identified in vertebrates and binds all three mammalian Hedgehogs: sonic (Shh), desert (Dhh), and Indian (Ihh). Like the Hedgehog receptor Patched, Hip is a transcriptional target of Hedgehog signaling (2). Unlike Patched, Hip's ability to bind hedgehogs is not involved in transducing a signal intracellularly, rather it regulates the availability of Hedgehog ligand extracellularly (3). Transgenic mice overexpressing Hip in proliferating chondrocytes display skeletal defects similar to those observed in Ihh mutant mice. These results indicate that Hip is involved in attenuating Hedgehog signaling (2). The expression pattern of Hip correlates with its ability to interact with all three mammalian Hedgehogs. It is expressed in a variety of organs, adjacent with sites of hedgehog expression. For instance, Shh is expressed in the epithelium of the lung, and Hip is found in the underlying lung mesenchyme (2). In fact, Hip knock-out mice exhibit neonatal lethality with respiratory failure due to defective branching morphogenesis. This phenotype correlates with altered expression of Shh markers suggesting an increase in Shh signaling (3). Interestingly, other developmental mechanisms that rely on normal Shh signaling, such as dorsal-ventral patterning of the neural tube, development of the somites, and organ laterality appeared histologically normal in Hip^{-/-} mice (3). Mouse and human Hip share 94% aa identity through the entire protein sequence (4). R&D Systems' recombinant Hedgehog-interacting protein is a potent antagonist of Shh signaling *in vitro*.

References:

1. Ingham, P.W. and A.P. McMahon (2001) *Genes & Dev* **15**:3059.
2. Chuang, P-T. and A.P. McMahon (1999) *Nature* **397**: 17.
3. Chuang, P-T. *et al.* (2003) *Genes & Dev.* **17**:342.
4. Bak, M. *et al.* (2001) *Cytogenet. Cell Genet.* **92**:300.