Recombinant Human Hip

Catalog Number: 9280-HP

DESCRIPTION

Source Chinese Hamster Ovary cell line, CHO-derived

Human Hip (Phe18-Asp670) Accession # Q96QV1	HP	GGGSGGGSGGGS	HHHHHH

N-terminus C-terminus

N-terminal Sequence Analysis Lys24

Predicted Molecular Mass 75 kDa

SPECIFICATIONS

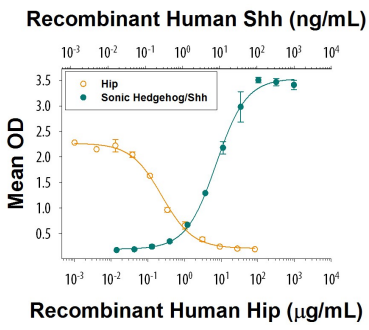
SDS-PAGE	77-89 kDa, reducing conditions
Activity	Measured by its ability to inhibit Sonic Hedgehog (Shh) induction of alkaline phosphatase production in C3H10T1/2 mouse embryonic fibroblast cells. Recombinant Human Hip (Catalog # 9280-HP) inhibits a constant dose of 20 ng/mL of Recombinant Human Sonic Hedgehog/Shh Protein, High Activity (Catalog # 8908-SH) in a C3H10T1/2 mouse embryonic fibroblast cell alkaline phosphatase induction assay with an ED_{50} = 0.1-0.6 µg/mL.
Endotoxin Level	<0.10 EU per 1 µg of the protein by the LAL method.
Purity	>95%, by SDS-PAGE visualized with Silver Staining and quantitative densitometry by Coomassie® Blue Staining.
Formulation	Lyophilized from a 0.2 µm filtered solution in PBS and NaCl. See Certificate of Analysis for details.

PREPARATION AND STORAGE

Reconstitution	Reconstitute at 500 µg/mL in 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.** ● 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.

DATA

Bioactivity



Recombinant Human Sonic Hedgehog/Shh (Catalog # 8908-SH) induces alkaline phosphatase production in C3H10T1/2 cells (green line). Recombinant Human Hip (Catalog # 9280-HP) inhibits a constant dose of 20 ng/mL of Recombinant Human Sonic Hedgehog/Shh Protein, High Activity (Catalog # 8908-SH) in C3H10T1/2 mouse embryonic fibroblasts with an ED_{50} = 0.1-0.6 µg/mL (orange line).

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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-attachment helix at the C-terminal end (2, 3). Mouse and human Hip share 94% aa sequence identity through the entire protein sequence (4). Alternative splicing generates a soluble isoform that lacks the C-terminal half of the protein (5). 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 (6). 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 (6). 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 (6). Hip is also expressed in vascular endothelial cells but is down-regulated during angiogenesis and in various tumors (7, 8).

References:

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