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ProductInformation

Hedgehog-interacting Protein
Mouse, Recombinant
Expressed in mouse NSO cells

Product Number **H 5163**

Product Description

Recombinant Mouse Hedgehog-Interacting Protein is produced from a DNA sequence encoding the extracellular domain of mouse hedgehog-interacting protein (Hip)[1] fused to a polyhistidine tag at the C-terminus. The recombinant protein is expressed in a mouse myeloma cell line, NSO. Based on N-terminal sequencing, this preparation contains a mixture of at least two peptides that have Lys 24 and Asp 52, respectively, at the N-terminus. The two peptides have calculated molecular masses of approximately 76 kDa and 73 kDa, respectively. Due to glycosylation and C-terminal proteolytic processing, the recombinant mouse Hip preparation contains peptides that migrate with apparent molecular masses of 80-90 kDa and 58-64 kDa in SDS-PAGE under reducing conditions.

Hedgehog signaling proteins act as mitogens, morphogens, or inducing factors in various cell types during embryonic development. They help growth, patterning, and morphogenesis in both vertebrates and insects.[2] Hip (Hedgehog-interacting protein) is a type I transmembrane protein identified for its ability to bind biologically active Shh (sonic hedgehog). Hip (700 amino acids) includes a hydrophobic signal sequence, two EGF-like domains near the C-terminus, and a 22 amino acid membrane-spanning region at the C-terminus.[1] Mouse and human Hip share 94% amino acid identity through the entire protein sequence.[3] This preparation of recombinant Hip acts as a potent antagonist of Shh signaling *in vitro*.

The expression pattern of Hip correlates with its ability to interact with all three mammalian Hedgehogs. Hip binds sonic hedgehog (Shh), desert hedgehog (Dhh), and Indian hedgehog (Ihh). Hip is expressed in a variety of organs, adjacent to sites of hedgehog expression. For example, Shh is expressed in lung epithelium, and Hip is found in the underlying lung mesenchyme.[1] Hip, like the hedgehog receptor Patched, is a transcriptional target of hedgehog signaling.[1] Unlike Patched, Hip-hedgehog binding is not involved in transducing a signal intracellularly, rather Hip regulates the availability of hedgehog ligand extracellularly.[4] Transgenic mice overexpressing Hip in proliferating chondrocytes show skeletal defects similar to those observed in Ihh mutant mice, indicating that Hip is involved in attenuating Hedgehog signaling.[1] Hip knock-out mice display 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.[4]

Reagent

Recombinant Mouse Hedgehog-Interacting Protein is supplied as approximately 50 µg of protein lyophilized from a 0.2 µm filtered solution in phosphate buffered saline containing 2.5 mg bovine serum albumin.

Storage/Stability

Store lyophilized product at −20 °C. Upon reconstitution, freeze in working aliquots for extended use. Repeated freezing and thawing is not recommended. Do not store in a frost-free freezer.

Preparation Instructions

Reconstitute the contents of the vial using 0.2 µm filtered phosphate buffered saline (PBS) containing at least 0.1% human serum albumin or bovine serum albumin. Prepare a stock solution of at least 10 µg/ml.

Product Profile

Recombinant Mouse Hedgehog-Interacting Protein is measured by its ability to inhibit sonic hedgehog (Shh) induction of alkaline phosphatase production in C3H10T1/2 fibroblasts. The ED_{50} of recombinant mouse Hip is measured in the presence of recombinant mouse Shh (5 µg/ml).

Endotoxin: < 1.0 EU (endotoxin units)/µg protein as determined by the LAL (Limulus amebocyte lysate) method.

References

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