Recombinant Human Indian Hedgehog

Accession #	Q14623
Alternate Names	IhhBDA1; BDA1Indian hedgehog homolog (Drosophila); HHG2; HHG-2 Indian hedgehog homolog
Source	Human embryonic kidney cell, HEK293-derived human Indian Hedgehog/Ihh protein
Protein sequence	Cys28-Gly202 (Cys28Ile-Ile), with an N-terminal Met
M.Wt	19.7 kDa
Appearance	Solution protein.
Stability & Storage	Avoid repeated freeze-thaw cycles. It is recommended that the protein be aliquoted for optimal storage. 12 months from date of receipt, -20 to -70 °C as supplied.
Concentration	0. 2 mg/mL
Formulation	Dissolved in sterile PBS buffer.
Reconstitution	We recommend that this vial be briefly centrifuged prior to opening to bring the contents to the bottom. This solution can be diluted into other aqueous buffers.
Biological Activity	Activity in progress
Shipping Condition	Shipping with dry ice.
Handling	Centrifuge the vial prior to opening.
Usage	For Research Use Only! Not to be used in humans.

Quality Control

Purity	> 95%, determined by SDS-PAGE.
Endotoxin	<0.010 EU per 1 ug of the protein by the LAL method.

Description

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) [1]. Hedgehog proteins are important signaling molecules during embryonic development and are highly conserved within and across species [1]. Mouse and human Ihh share 100% amino acid identity in the signaling domain, while mouse Ihh and Shh share 90% amino acid identity in the N-terminal signaling domain. Ihh mRNA expression is detected in fetal lung, gut, stomach, liver, kidney, pancreas and strongly in cartilage - in growth regions of the developing bone [2, 3]. Ihh, along with parathyroid hormone related protein, regulate the rate of chondrocyte proliferation and differentiation [4]. Ihh is also involved in yolk sac vasculogenesis, playing an important role in differentiation of epiblast cells into endothelial and red blood

cells [5]. Mouse Ihh cDNA encodes a 411 amino acid (aa) polypeptide with a predicted 27 aa signal peptide. This polypeptide is cleaved to generate a 45 kDa precursor protein that undergoes the same post-translation processing as Shh [3]. An autocatalytic reaction yields a 19 kDa amino-terminal domain Ihh-N protein that retains all known signaling capabilities, and a 23 kDa carboxy-terminal domain Ihh-C protein [3]. Since hydrophobic modifications to Shh, including the substitution of the N-terminal cysteine residue with two hydrophobic isoleucine residues, can also increase its potency [6], a similar modification was made for Ihh. This modified form also shows increased potency in a bioassay measuring induction of alkaline phosphatase. At the cell surface, Hedgehog activity is mediated by a multicomponent receptor complex involving the 12-pass transmembrane protein Patched (Ptc) which binds Hedgehogs with high affinity and Smoothened (Smo), a signaling seven transmembrane G-protein coupled receptor [1].

Reference

[1]. Ingham, P. and A. McMahon (2001) Genes & Dev. 15:3059.

[2]. Marigo, V. et al. (1995) Genomics 28:44.

[3]. Valentini, R.P. et al. (1997) J Biol Chem. 272:8466.

[4]. Vortkamp, A. et al. (1996) Science 273:613.

[5]. Byrd, N. et al. (2002) Development 129:361.

[6]. Taylor, F.R. et al. (2001) Biochemistry 40: 4359.