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Product Information

NOGGIN/Fc CHIMERA

Mouse, Recombinant

Expressed in mouse NSO cells

Product Number **N 6784**

Product Description

Noggin is a 26 kDa secreted protein, originally cloned based on its dorsalizing activity in *Xenopus*. Mouse noggin cDNA encodes a 232 amino acid precursor with a 19 amino acid putative signal peptide that is cleaved to generate the 213 amino acid mature protein. Recombinant mouse Noggin/Fc chimera is a disulfide-linked homodimeric glycoprotein comprised of a signal peptide from human CD33 (Met 1–Ala 16), amino acids 20–232 of mouse noggin, and a polypeptide linker, fused to the Fc region of human IgG (Pro 100–Lys 330). Mouse Noggin/Fc has Leu 20 at the amino terminus and has a calculated molecular mass of approximately 50 kDa. Due to glycosylation, the protein migrates as an approximately 55–60 kDa protein in SDS-PAGE under reducing conditions. Mature mouse noggin shares a 99% and 83% homology with human and *Xenopus* noggin respectively. Mammalian noggin is active in induction assays on *Xenopus* embryos.^{1,2}

Noggin is required for cartilage morphogenesis and joint formation. It is also an inhibitor of bone morpho-genic proteins (BMPs) signaling which is necessary for the growth and patterning of neural tube and somite. Studies indicate that noggin may play a critical role in the formation of gradients of BMP activity. Noggin is produced in the mesoderm in developing embryos and has been shown to have a high affinity to BMP binding protein. When Noggin binds to BMPs, inhibition occurs, preventing BMPs from interacting with receptors on the cell surface.^{3,4} Studies indicate that noggin plays a critical role in the formation of gradients of BMP activity. Knockout mice lacking expression of noggin die at birth from multiple defects including bony fusion of the appendicular skeleton.⁵

Noggin has a high binding affinity to heparin and heparan sulfate proteoglycans at the cell surface. Heparan sulfate-bound noggin remains active and capable of binding BMP4 at the plasma membrane. Noggin can also be competitively displaced by heparin when bound to cells that express heparan sulfate proteoglycan.⁴

Reagent

Recombinant Mouse Noggin/Fc chimera is supplied as 50 µg of protein lyophilized from a sterile-filtered PBS.

Preparation Instructions

Reconstitute the vial contents with sterile PBS containing at least 0.1% human or bovine serum albumin. Stocks should be at least 50 µg/ml.

Storage/Stability

Lyophilized samples are stable at least six months at –20 °C. Upon reconstitution, store at 2 to 4 °C for up to one month. For extended storage, store in working aliquots at –20 °C. Repeated freeze-thaw cycles should be avoided. Do not store in a frost-free freezer.

Product Profile

Noggin/Fc binds to and inhibits recombinant human BMP4 induced alkaline phosphatase production by ATDC5 cells. The concentration range is 0.3 to 1.0 µg/ml in the presence of 75 ng/ml rhBMP4. Optimal dilutions should be determined by each laboratory for each application. Purity: >95% by SDS-PAGE under reducing conditions and visualized by silver stain.

References

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3. Brunet, L. J., et al, Noggin, Cartilage Morpho-genesis, and Joint formation in the Mammalian Skeleton. *Science*, **280**, 1455-1457 (1998).
4. Paine-Saunders, et al., Heparan Sulfate Proteoglycans Retain Noggin at the Cell Surface. *J. Biol. Chem.*, Nov. 12 (e-pub) (2001).
5. Minina, E. et al., BMP and Ihh/PThrP signaling interact to coordinate chondrocyte proliferation and differentiation. *Development*, **128**, 4523-4534 (2001).

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