RECOMBINANT BOVINE FIBROBLAST GROWTH FACTOR 2 (FGF2)

Bovine Fibroblast Growth Factor 2 (FGF2) is a protein encoded by the FGF2 gene in Bos taurus (cattle). It is a member of the fibroblast growth factor family and plays a critical role in cell proliferation, differentiation, angiogenesis, and wound healing. Bovine FGF2 exists in multiple isoforms generated by alternative initiation of translation, including low molecular weight (~17 kDa) and high molecular weight variants. The 17 kDa isoform is predominantly cytosolic and acts through cell surface receptors, whereas the 22, 22.5, 24 and 34 kDa isoforms are nuclear and may signal independent of transmembrane receptor pathways.

FGF-2 has been proposed to play an important role in the development and function of multiple organ systems including the lungs, reproductive system, nervous system, skin, eye, hematopoietic system, muscles, bones, and the digestive system. In addition, FGF-2 is important for homeostatic functions and tissue regeneration. It also acts as a promising therapeutic agent for a variety of conditions, including cardiac repair, nerve injury recovery, bone regeneration, and respiratory diseases. Due to its crucial biological functions and its role in serum-free media formulations, FGF2 remains one of the most studied and applied growth factors in both regenerative medicine and sustainable meat production technologies. FGF2 is a key growth factor used in the cellular agriculture industry, particularly in the production of cell-cultured meat. Traditionally derived from serum, growth factors like FGF2 are now increasingly produced through recombinant methods to enable serum-free culture systems.

Recombinant Bovine FGF2 from Resolve Biotech is a biologically active 17 kDa protein, expressed in *E.coli* and purified using conventional ion-exchange and affinity chromatography techniques.

Technical Specifications

A. Purity:

Resolve's Recombinant Bovine FGF2 is >95% pure as determined by reducing and non-reducing SDS-PAGE (Figure 1).

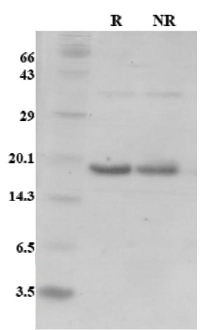

Figure 1. SDS-PAGE gel image of Resolve's Recombinant FGF2
Lane 1: Ladder,
Lane 2: FGF2 in reducing conditions
Lane 3: FGF2 in non-reducing conditions

B. Western Blot

Resolve's Recombinant FGF-2 has been validated using anti-FGF2 antibody as shown in figure 2.

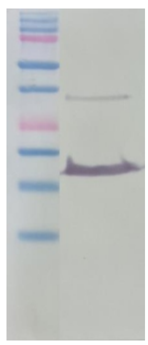

Figure 2. Western blot image of Resolve's Recombinant FGF2
Lane 1: Ladder, Lane 2: FGF2

C. Biological Activity

Fibroblast Growth Factor 2 (FGF2) is a key regulator of tissue development, repair, and regeneration by promoting cellular processes such as proliferation, survival, and differentiation. FGF2 binds to specific fibroblast growth factor receptors (FGFRs), including FGFR1c, FGFR2c, FGFR3c, and FGFR1b. Heparan sulfates act as essential cofactors, stabilizing the FGF2-FGFR interaction and facilitating receptor dimerization and autophosphorylation. This activation triggers multiple downstream signaling pathways, most notably MAPK/ERK and PI3K/AKT, which regulate gene expression and drive cell cycle progression and survival. In NIH3T3 fibroblast cells, FGF2 stimulates proliferation through autocrine and paracrine signaling mechanisms, playing a vital role in maintaining tissue homeostasis and supporting repair processes.

Resolve's Recombinant Bovine FGF2 is a biologically active protein as measured in a cell proliferation assay using NIH-3T3 cells. (Figure 3). The ED50 for this effect is <4 ng/mL.

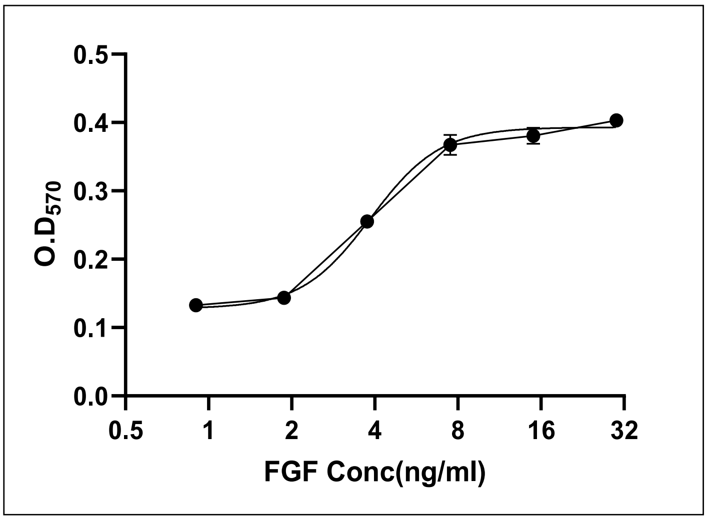

Figure 3: FGF2 mediated proliferation assay using NIH-3T3 cells

References

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2.Li L. et. al., (2024) Scaling up production of recombinant human basic fibroblast growth factor in an Escherichia coli BL21(DE3) plysS strain and evaluation of its pro-wound healing efficacy. Front. Pharmacol. 14:1279516.

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