

# Cloning, Expression And Purification Of Fibroblast Growth Factor-2 Using pETite N-His SUMO vector in *Escherichia coli*

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## ABSTRACT

Growth factors are specific set of polypeptides that act via association with high-affinity transmembrane receptors to induce numerous functions like cell proliferation, differentiation and survival. Fibroblast growth factors (FGFs) make up a large family of polypeptide growth factors that are found in organisms ranging from nematodes to humans. In vertebrates, the 22 members of the FGF family range in molecular mass from 17 to 34 kDa and share 13-71% amino acid identity. Basic fibroblast growth factor [basic FGF (bFGF); FGF-2] is an important member of the FGF family with a potent angiogenic capability that stimulates smooth muscle cell growth, wound healing, and tissue repair. According to aforementioned importance, we decided to clone, express and purify this protein. After codon optimization and gene synthesis using SUMO tag, the optimized FGF-2 gene was subcloned into expression vector, pET21, and transformed into *E.coli* BL21 for expression. The expression parameters were optimized to produce a high level of FGF-2. The highest level of soluble expression was obtained in 0.5 mM IPTG at 37°C for 4h following induction. The fusion protein was purified from soluble fraction of cytoplasmic proteins on a Ni-NTA agarose column and its purification was confirmed by SDS-PAGE.

**Key words:** growth factors, FGF2, recombinant proteins, *E. coli*