Fibroblast Growth Factor Family (FGF)


Fibroblast Growth Factors (FGFs) are potent regulators of cell proliferation, differentiation and function and are critically important in normal development, tissue maintenance and wound repair. FGFs are also linked with several pathological conditions.1,2,3 There are at least 20 FGF members, designated FGF-1 through FGF-20, but acidic FGF and basic FGF are names commonly used for FGF-1 and FGF-2, and keratinocyte growth factor (KGF) for FGF-7. Although FGF was originally named after its fibroblast mitogenicity,4 some FGFs do not induce fibroblast growth at all. Members of the FGF family generally share 30-50% amino acid sequence homology, have two conserved cysteine residues, and bind with high affinity to heparin. Several FGF members are oncogene products, e.g., FGF-3 (int-2), FGF-4 (hst-1, K-FGF), FGF-5 and FGF-6 (hst-2). FGFs interact with four distinct FGF receptors on cells of mesodermal, ectodermal and endodermal origin, eliciting changes in migration, morphology, function or proliferation. FGFs play several roles, including angiogenesis, wound healing, tissue regeneration, embryonic development, endocrine modulation and neurotrophic support.3

Acidic FGF (aFGF) and basic FGF (bFGF) are the prototypic FGF members named because of their different isoelectric points. They share a 55% homology in amino acid sequence and similar size, depending on translation extensions and truncations (15-18 kDa for aFGF and 16-24 kDa for bFGF). Neither aFGF nor bFGF genes include a secretory signal sequence and the principle mechanism of their release into extracellular fluid has not yet been resolved. Acidic FGF has high expression levels in brain, retina, bone matrix and osteosarcomas. Basic FGF is found in a variety of tissues, including pituitary gland, neural tissue, adrenal cortex, corpus luteum, and placenta. Acidic and basic FGFs stimulate proliferation in all cells of mesodermal origin, and many cells of neuroectodermal, ectodermal, and endodermal origin. They are chemotactic and mitogenic for endothelial cells and induce the release of agents that break down basement membranes. These two FGFs appear to play significant roles in modulating such normal processes as angiogenesis, tissue repair, embryonic development, and neural function. They also appear to participate in some pathological conditions that involve excessive cell proliferation or angiogenesis, such as tumor production.

Immortalized cortical cell line in the presence of growth factors bFGF (Cat. No. F0291) and EGF (Cat. No. E9644). Cultures are predominantly GFAP staining astrocytes (red) with a few β III-tubulin staining neurons (green). Counterstaining of cell nuclei with Hoechst dye. Images of human neural stem cells courtesy of ReNeuron Limited, United Kingdom.

### Materials

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<th>Product #</th>
<th>Image</th>
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<td>Fibroblast Growth Factor-Basic human recombinant, expressed in</td>
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References