IMMUNOLOGICAL SCIENCES Product Data Sheet

GRF-10544 **Recombinant Human Epidermal Growth Factor**

Size: 500 ug

Synonyms: Urogastrone, URG, EGF.

Introduction: Epidermal growth factor has a profound effect on the differentiation of specific cells in vivo and is a potent mitogenic factor for a variety of cultured cells of both ectodermal and mesodermal origin. The EGF precursor is believed to exist as a membrane-bound molecule which is proteolytically cleaved to generate the 53-amino acid peptide hormone that stimulates cells to divide. EGF stimulates the growth of various epidermal and epithelial tissues in vivo and in vitro and of some fibroblasts in cell culture.

Description: Epidermal Growth Factor Human Recombinant produced in E.Coli is a single, non-glycosylated, polypeptide chain containing 53 amino acids and having a molecular mass of 6.2kDa. The EGF is purified by proprietary chromatographic techniques.

Source: Escherichia Coli.

Physical Appearance Sterile Filtered White lyophilized (freeze-dried) powder.

Formulation The protein was lyophilized from a concentrated (1mg/ml) solution containing PBS pH-7.4.

Solubility It is recommended to reconstitute the lyophilized Epidermal Growth Factor in sterile 18MΩ-cm H2O not less than 100µg/ml, which can then be further diluted to other aqueous solutions.

Stability: Lyophilized Epidermal Growth Factor Recombinant although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution EGF should be stored at 4°C between 2-7 days and for future use below -18°C.
For long term storage it is recommended to add a carrier protein (0.1% HSA or BSA). Please prevent freeze-thaw cycles.

Purity: Greater than 98.0% as determined by:
(a) Analysis by HPLC
(b) Analysis by SDS-PAGE

Amino acid sequence: NSDSECPLSH DGYCLHDGVC MYIEALDKYA CNCVVGYIGE RCQYRDLKWW ELR.

Biological Activity: The ED_{50} as determined by a cell proliferation assay using murine Balb/c 3T3 cells is less than 0.1 ng/ml, corresponding to a specific activity of $>1.0x10^7$ IU/mg.

Background: In the sphere of biomedical studies, epidermal boom factor (EGF) is a cornerstone that gives precious insights into the mechanisms underlying tissue healing, differentiation, and mobile proliferation. In this article we will explore the characteristics and uses of epidermal growth factor (EGF).

Epidermal growth factor (EGF) is a 6-kDa protein consisting of 53 amino acid residues and 3 intramolecular disulfide linkages. Human tissues, such as platelets, the parotid gland, and the submandibular gland, are rich in EGF. EGF, which was first discovered in human urine and the submaxillary glands of mice, functions as a major modulator of cell proliferation by attaching to its receptor, EGFR, which is found on the cell membrane. EGF triggers autophosphorylation of transmembrane protein tyrosine kinase EGFR upon binding, hence initiating downstream signaling cascades through pathways such as phosphatidylinositol and ras.

Beyond the cell membrane, EGF has a variety of roles as it also initiates cytoplasmic processes such actin depolymerization and membrane ruffle formation. Studies indicate that EGF and its receptor might possibly be important components of the nucleus, highlighting the complexity of EGF-mediated cellular responses.

By attaching to the epidermal growth factor receptor (EGFR), EGF promotes the survival, differentiation, and multiplication of cells. This connection is essential for boosting many physiological processes and stimulating cell proliferation. The preservation of oro-esophageal and stomach tissue integrity is greatly supported by salivary EGF, which is regulated by dietary inorganic iodine. Its actions include the healing of gastric and oral ulcers, the inhibition of gastric acid secretion, the stimulation of DNA synthesis, and the protection of mucosal surfaces against harmful substances such as bile acids, gastric acid, and bacteria. Salivary EGF's role extends to repairing gastric tissue and addressing oro-esophagal issues, showcasing its healing ability in resolving oral and gastrointestinal ailments, including ulcers.

EGF functions by forming a strong bond with the cell surface's epidermal growth factor receptor (EGFR), which triggers ligand- induced dimerization. This incident sets off the intrinsic protein-tyrosine kinase activity of EGFR, which in turn initiates a signal transduction cascade inside the cell. Numerous biochemical changes are brought about by this cascade, such as increased intracellular calcium levels, increased glycolysis and protein synthesis, and increased expression of particular genes, most notably the EGFR gene. These carefully planned alterations eventually promote DNA synthesis and cell division, illuminating the complex process by which EGF directs basic biological functions and modulates cellular responses.