Recombinant Human B Lymphocyte Stimulator (rh BAFF / CD257)

**Synonyms**: BAFF, BLYS, CD257, TALL1, THANK, ZTNF4, TALL-1, TNFSF20, TNFSF13B, B-cell Activating Factor.

**Introduction**: BAFF, a member of the TNF family of ligands, is expressed in T cells, macrophages, monocytes and dendritic cells. BAFF is involved in stimulation of B and T cell function, and is an important survival and maturation factor for peripheral B cells. BAFF signals through three different TNF receptors TACI, BCMA and BAFF-R. The human BAFF gene codes for a 285 amino acid type II transmembrane protein containing a 46 amino acid cytoplasmic domain, a 21 amino acid transmembrane domain, and a 218 amino acid extracellular domain. The protein contains the TNF-like portion of the extracellular domain of BAFF. Administration of BAFF to mice disrupts splenic B-cell and T-cell zones and results in elevated levels of serum immunoglobulin.

**Description**: Recombinant human BAFF produced in E.Coli is a single, non-glycosylated polypeptide chain containing 153 amino acids and having a molecular mass of 17 kDa. The rh BAFF is purified by proprietary chromatographic techniques.

**Source**: Escherichia Coli

**Physical Appearance**: Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation**: Lyophilized from a 0.22µm filtered solution in PBS, pH 7.4

The samples of 1 µg contain Trehalose 5% (w/vol) for better recovery

**Solubility**: It is recommended to reconstitute the lyophilized rh BAFF in sterile H2O not less than 100 µg/ml, which can then be further diluated to other aqueous solutions.

**Stability**: Lyophilized rh BAFF although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh BAFF should be stored at 4° C between 2-7 days and for future use below -18° C. Please prevent freeze-thaw cycles.

**Purity**: Greater than 95.0% as determined by SDS-PAGE.

**Amino Acid Sequence**: MAVQGPEETV TQDCLQLIADI SEPPTIQKGS YTFVPWLLSF KRGSALEKE NKILVKETGY FFYYGQVLVLT DKTYAMGLHI QRRKVKHFPGD ELSLVTFLRC IQNMPETLPM NSCYSAIYK LEEGDQLQAIPRENAQISL DGDVTFGGAL KLL.

**Endotoxity**: The endotoxin level is less than 1 EU / µg determined by LAL method.

**Biological Activity**: Tested by its ability to stimulate secretion of IL-8 of human PBMCs. The ED50 for this effect is less than 10ng/ml corresponding to a specific activity of 10^5 IU/mg

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Recombinant Human Bone Morphogenetic Protein -2 (rh BMP-2)

Synonyms: BMP-2, BMP2A.

Introduction: BMPs (Bone Morphogenetic Proteins) belong to the TGF-beta superfamily of structurally related signaling proteins. BMP-2 is a potent osteoinductive cytokine, capable of inducing bone and cartilage formation in association with osteoconductive carriers such as collagen and synthetic hydroxyapatite. In addition to its osteogenic activity, BMP-2 plays an important role in cardiac morphogenesis and is expressed in a variety of tissues including lung, spleen, brain, liver, prostate ovary and small intestine. BMP-2 regulates similarly to its nearest homologue BMP-4 diverse fundamental processes during embryonic development: BMP-2 and other BMP proteins have great potential for medical therapeutic application, in particular because they allow or at least accelerate the ossification of extensive bone lesions. BMP-2 lacks the natural N-terminus which results in a 15-20 fold increase of specific activity. BMP-2 is a heparin binding protein.

Description: Recombinant human Bone Morphogenetic Protein-2 (BMP-2) is a disulfide-bonded homodimeric, non-glycosylated protein consisting of two 115 amino acid polypeptide chains with an apparent molecular weight of 26 kDa. The human BMP-2 is purified by proprietary chromatographic techniques.

Source: Escherichia Coli.

Physical Appearance: Sterile filtered white lyophilized (freeze-dried) powder.

Formulation: Lyophilised from a 0.22 µm filtered solution in 25 mM sodium acetate, pH 4.0. The aliquots of 1µg and 2 µg contain Trehalose 5% (w/vol) for better recovery.

Solubility: The lyophilised BMP-2 is soluble in distilled water and most aqueous buffer at concentrations greater than 1 mg/ml when the pH is below 6.0. Above pH 6.0 the solubility is low, but could be increased by addition of 1M NaCl or 30% 2 propanol.

Stability: Lyophilized rh BMP-2 although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution rh BMP-2 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% HSS or BSA). Please prevent freeze-thaw cycles.

Purity: Greater than 95.0% as determined by SDS-PAGE silver stained gel.

Biological Activity: Measured by the ability of BMP-2 to induce alkaline phosphatase production by C2C12 myogenic cell the specific activity is ~ 2.5x 10^3 units/mg

Endotoxicity: The endotoxin level is less than 1 EU / µg determined by LAL method

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Recombinant Human Bone Morphogenetic Protein –7 (rh BMP-7CHO)

**Synonyms:** Osteogenic Protein 1, OP-1, BMP-7

**Introduction:** The bone morphogenetics proteins (BMPs) are a family of secreted signaling molecules that can induce ectopic bone growth. Many BMPs are part of the transforming growth factor- beta (TGFB) superfamily. BMPs were originally identified by an ability of demineralized bone extract to induce endochondral osteogenesis in vivo in an extraskeletal site. Based on its expression early in embryogenesis, the BMP encoded by this gene has a proposed role in early development. In addition, the fact that this BMP is closely related to BMP 5 and BMP 7 has lead to speculation of possible bone inductive activity.

**Description:**
N-TERMINAL---human BMP-2 (Met 1-Arg 282) human BMP-7 (Ser 293-Arg 431)—C-TERMINAL

The DNA sequence encoding the human BMP-2 signal peptide and propeptide (1~282 amino acid) fused to the human BMP-7 mature chain (293~431 amino acid) was expressed in a Chinese hamster ovary cell line. The mature recombinant BMP-7 generated by the proteolytic removal of the signal peptide and propeptide contains 139 amino acid residues. The glycosylation of BMP-7 increases the molecular mass and the glycosylated proteins migrate as 25 ~ 40 kDa in SDS-PAGE under non-reducing conditions.

BMP-7 is purified by proprietary chromatographic techniques.

**Source:** Chinese Hamster Ovary Cells.

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilised from a 0.2qm filtered solution containing 1% sucrose, 1.2% mannitol, 20mM glycine and 0.05% tween 20, pH 4.

The aliquots of 1µg and 2 µg contain Trehalose 5% (w/vol) for better recovery.

**Solubility:** It is recommended to reconstitute the lyophilised BMP-7 in sterile / endotoxin free water not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Purity:** Greater than 97% as determined by SDS-PAGE and RP-HPLC.

**Stability:** Lyophilized rh BMP-7 although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh BMP-7 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 avoid freeze-thaw cycles.

**Biological Activity:** Measured in alkaline phosphatase activity assay using MC3T3-E1 cells. The ED₅₀ for this effect is < 70 ng/ml, corresponding to a Specific Activity of 14,268 IU/mg

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Recombinant Human Connective Tissue Growth Factor (rh CTGF)

**Synonyms:** CCN2, NOV2, HCS24, IGFBP8, MGC102839, CTGF

**Introduction:** Connective Tissue Growth Factor belongs to the CCN family of proteins. The CCN family presently consists of six members in human also known as: Cyr61 (Cystein rich 61), CTGF (Connective Tissue Growth Factor), Nov (Nephroblastoma Overexpressed gene), WISP-1, 2 and 3 (Wnt-1 Induced Secreted Proteins). The CCN genes encode secreted proteins associated with the Extracellular Matrix (ECM) and cell membrane. CCN proteins are matricellular proteins which are involved in the regulation of various cellular functions including: proliferation, differentiation, survival, adhesion and migration. They are expressed in the derivatives of the three embryonic sheets and are implicated in the development of kidney, nervous system, muscle, bone marrow, cartilage and bone. During adulthood, they are implicated in wound healing, bone fracture repair, and pathologies such as: fibrosis, vascular ailments and tumorigenesis. Full length secreted CCN proteins can show an antiproliferative activity, whereas truncated isoforms are likely to stimulate proliferation and behave as oncogenes. The full length protein consists of four modules: Module I shares partial identity with the N-terminal part of the Insulin-like Growth Factor Binding Proteins (IGFBPs). Module II includes a stretch of 70amino acid residues – which shares sequence identity with the Von Willebrand Factor Type C repeat (VWC). Module III contains sequences sharing identity with the Thrombospondin type 1 repeat (TSP1) (WSXCSXXCG), which is thought to be implicated in the binding of sulfated glycoconjugates and to be important for cell adhesion. Module IV, also designated CT, is encoded by exon 5. It is the leasts conserved one of the four domains at the level of nucleotide sequence, but it appears to be critical for several of the biological functions attributed to the CCN proteins. Module IV resembles the CT domain of several extracellular protein including, Von Willebrand's factor and mucins. Sequence similarities to heparin-binding motifs are also found within this domain. Proteolysis of the secreted full-length CCN proteins that has been reported in the case of CCN2 and CCN3 might result in the production of CCN-derived peptides with high affinity for ligands that full-length CNN proteins bind only poorly. Amino-truncated CCN2 isoforms were biologically active whereas no specific biological activity has been attributed to the truncated CCN3. Although the molecular processes underlying the production of these secreted isoforms is presently unknown, it is important to note that proteolysis occur at the same amino acid residues in both CCN2 and CCN3. An elevated expression of CCN2 has also been detected by Northern blotting in human invasive mammary ductal carcinomas, dermatofibromas, pyogenic granuloma, endothelial cells of angiolipomas and angioleiomyomas, and in pancreatic tumors. A study performed with chondrosarcomas representative of various histological grades established that CCN2 expression was closely correlated with increasing levels of malignancy. In agreement with CCN2 playing a role in brain tumor angiogenesis, immunocytochemistry studies indicated that both glioblastoma tumor cells and proliferating endothelial cells stained positive for CCN2. In astrocytomas, CCN2 expression was particularly elevated in high grade tumors, with a marked effect of CCN2 on cell proliferation. Downregulation of CCN2 expression in these cells was associated with a growth arrest at the G1/S transition while over-expression of CCN2 induced a two-fold increase of the number of cells in the G1 phase. Gene profiling analysis allowed to identify a set of about 50 genes whose expression might account for the proliferative activity of CCN2 in these cells. CCN2 was seen in a higher proportion of mononuclear cells of patients with acute lymphoblastic leukemia.

**Description:** rh CTGF produced in E.Coli is a single, non-glycosylated, polypeptide chain containing 98 amino acids and having a molecular mass of 11.2 kDa. The CTGF is purified by proprietary chromatographic techniques.

**Source:** Escherichia Coli.

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilized from 1mg/ml solution containing 10mM NaAcetate buffer pH-6. The samples of 1µg contain Trehalose 5% (w/vol) for better recovery

**Solubility:** Reconstitute at 0.1 mg/ml with 5mM NaAcetate, pH-6

**Stability:** Lyophilized rh CTGF, although stable at room temperature for 3 weeks, should be stored desiccated below –18° C. Upon reconstitution rh CTGF 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:** Purity of CTGF is greater than 95% as determined by SDS-PAGE.

**Endotoxicity:** The endotoxin level is less than 1 EU / µg determined by LAL method.

**Amino acid sequence:** MGKKCIRTPK ISKPPIKELS GCTSMKTYRA KFGVGVDGR CCTPHRTTTL PVEFKCPDGE VMKMNMMFIK TCACHYNCPG DNDIFESLYY RKMYGDMA

**Biological Activity:** Determined by the dose-dependent stimulation of the proliferation of HUVEC cells. The expected ED₅₀ for this effect is 1.0-2.0 µg/ml.

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Recombinant Human Epidermal Growth Factor (rh EGF)

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 of some fibroblasts in cell culture.

Description: Recombinant Human EGF produced in E.Coli is a single, non-glycosylated, polypeptide chain containing 53 amino acids and having a molecular mass of 6222 Dalton. The rh EGF is purified by proprietary chromatographic techniques.

Source: Escherichia Coli.

Physical Appearance: Sterile filtered white lyophilized (freeze-dried) powder.

Formulation: lyophilized from a concentrated solution containing PBS, pH 7.4. The aliquots/sample sizes of 1µg contain Trehalose 5% (w/vol) for better recovery.

Solubility: It is recommended to reconstitute the lyophilized rh EGF in sterile H2O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

Stability: Lyophilized rh EGF although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh 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 SEC-HPLC.
(b) Analysis by SDS-PAGE.

Amino acid Sequence: NSDSECPLSH DGYCLHDGVC MYIEALDKYA CNCVGYIGE RCQYRDLKWW ELR

Biological Activity: The ED50 calculated by the dose-dependant proliferation of murine BALB/c 3T3 cells (measured by 3H-thymidine uptake) is < 0.1 ng/ml, corresponding to a specific activity of 1 x 10^7 Units/mg.

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Recombinant Human Fibroblast Growth Factor-acidic (rh FGF-a / FGF-1)

Synonyms: HBGF-1, ECGF-beta, FIBP, FGFIBP, FIBP-1, ECGF, ECGF-

Introduction: Acidic fibroblast growth factor is a member of the fibroblast growth factor (FGF) family. FGF family members possess broad mitogenic and cell survival activities, and are involved in a variety of biological processes, including embryonic development, cell growth, morphogenesis, tissue repair, tumor growth and invasion. This protein functions as a modifier of endothelial cell migration and proliferation, as well as an angiogenic factor. It acts as a mitogen for a variety of mesoderm- and neuroectoderm-derived cells in vitro, thus is thought to be involved in organogenesis. Three alternatively spliced variants encoding different isoforms have been described. The heparin-binding growth factors are angiogenic agents in vivo and are potent mitogens for a variety of cell types in vitro. There are differences in the tissue distribution and concentration of these 2 growth factors.

Description: Recombinant human FGF-acidic (FGF-1) produced in E.Coli is a single, non-glycosylated, polypeptide chain containing 141 amino acids and having a molecular mass of 15967 Dalton. The rh FGF-acidic is purified by proprietary chromatographic techniques.

Source: Escherichia Coli.

Physical Appearance: Sterile filtered white lyophilized (freeze-dried) powder.

Formulation: lyophilized from 0.22µm filtered solution in 10mM sodium phosphate, 75mM NaCl, pH 7.5. The samples of 1µg contain Trehalose 5% (w/vol) for better recovery

Solubility: It is recommended to reconstitute the lyophilized rh FGF-acidic in sterile H2O at 4 degrees Celsius at a concentration of 0.1mg - 0.25mg per 1ml. Allow sample to sit for 5 minutes at 4 degrees, spin to remove precipitant.

Stability: Lyophilized rh FGF-acidic although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh FGF-acidic 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 95.0% as determined by SDS-PAGE.

Amino acid Sequence: MFNLPPGNYK KPKLLYCSNG GHFLRLPDG TVDGTRDRSD QHIQLQLSAE SVGEVYIKST ETGQYLMAMDT DGLLYGSGQP NEECLFLERL EENHYNTYIS KKHAEKNWFV GLKKNGSCKR GPRTHYGQKA IFLPLPVSS D

Endotoxicity: The endotoxin level is less than 1 EU / µg determined by LAL method.

Biological Activity: Calculated by the dose-dependant proliferation of BAF3 cells expressing FGF receptors the ED50 is < 1 ng/ml.

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Recombinant Human Fibroblast Growth Factor-basic (rh FGF-b / FGF-2)

Synonyms: Prostaparin

Introduction: Basic fibroblast growth factor is a member of the fibroblast growth factor (FGF) family. FGF family members possess broad mitogenic and cell survival activities, and are involved in a variety of biological processes, including embryonic development, cell growth, morphogenesis, tissue repair, tumor growth and invasion. This protein functions as a modifier of endothelial cell migration and proliferation, as well as an angiogenic factor. It acts as a mitogen for a variety of mesoderm- and neuroectoderm-derived cells in vitro, thus is thought to be involved in organogenesis. Three alternatively spliced variants encoding different isoforms have been described. The heparin-binding growth factors are angiogenic agents in vivo and are potent mitogens for a variety of cell types in vitro. There are differences in the tissue distribution and concentration of these 2 growth factors.

Description: Recombinant human FGF-b produced in E.Coli is a single, non-glycosylated polypeptide chain containing 154 amino acids and having a molecular mass of 16.5 kDa. The rh FGF-b is purified by proprietary chromatographic techniques.

Source: Escherichia Coli

Physical Appearance: Sterile filtered white lyophilized (freeze-dried) powder.

Formulation: Lyophilized from a 0.22 µm filtered solution in 25 mM sodium phosphate, 200 mM NaCl, pH 7.6. The samples of 1µg contain Trehalose 5% (w/vol) for better recovery.

Solubility: It is recommended to reconstitute the lyophilized FGF-basic in sterile H₂O, not less than 100µg/ml, which can then be further diluted to other aqueous solutions.

Stability: Lyophilized rh FGF-basic although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh FGF-basic should be stored 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 95.0% as determined by SDS-page.

Amino Acid Sequence: MAAGSITTLP ALPEDGGSGA FPPGHFKDPK RLYCKNGGFF LRIHPDGRVD GVREKSDPHI KLQLQAEEGR VVSIKGVCAN RYLAMKEDGR LLASKCVTDE CFFFERLESN NYNTYRSRKY TSWYVALKRT GQYKLGSKTG PGKAILFLP MSAKS

Endotoxin level: The endotoxin level is less than 1 EU / µg determined by LAL method

Biological Activity: Tested by dose dependent stimulation of proliferation of murine 3T3 fibroblast cell line the biological activity of rh FGF-2 is 1x10^7 IU/mg

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Recombinant Human Flt3-Ligand (rh Flt3 / CD135)

**Synonyms:** Fms-related tyrosine kinase 3 ligand, Stem Cell Tyrosine Kinase 1, STK1

**Introduction:** Flt3-Ligand is a growth factor that regulates proliferation of early hematopoietic cells. Flt3-Ligand binds to cells expressing the tyrosine kinase receptor Flt3. Flt3-Ligand by itself does not stimulate proliferation of early hematopoietic cells, but synergizes with other CSFs and Interleukins to induce growth and differentiation. Unlike SCF, Flt3-Ligand exerts no activity on mast cells. Multiple isoforms of Flt3-Ligand have been identified. The predominant biologically active form is anchored to the cell surface as the extracellular domain of a transmembrane protein (209 a.a.). The membrane-bound isoform can be proteolytically cleaved to generate a biologically active soluble isoform.

**Description:** Recombinant human Flt3-Ligand produced in E.Coli is a non-glycosylated, polypeptide chain containing 155 amino acids and having a molecular mass of 17.6 kDa. The rh Flt3-Ligand is purified by proprietary chromatographic techniques.

**Source:** Escherichia Coli.

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilized from a 0.22 µm filtered solution in 50 mM Tris, 200 mM NaCl, pH 8.0. The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery

**Solubility:** It is recommended to reconstitute the lyophilized rh Flt3-Ligand in sterile H2O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh Flt3-Ligand although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh Flt3-Ligand 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 95.0% as determined by SDS-PAGE / silver stain.

**Endotoxicity:** The endotoxin level is less than 1 EU/µg determined by LAL method

**Amino acid Sequence:** TQDCSFQHSP ISSDFAVKIR ELSDYLLQDY PVTVASNLQD EELCGGLWRL VLAQRWMERL KTVAGSKMQG LLERVNTEIH FYTKCAFQPP PSCLRFVQTN ISRLQETSE QLVALKPWIT RQNFSCCLEL QCQPDSSTLP PPWSRPGLEA TAPTA

**Biological Activity:** The ED50 range is 0.5 - 1.0 ng/ml measured by its ability to promote proliferation of Flt3-transfected murine 32D cells.

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Recombinant Human Granulocyte Colony Stimulating Factor (rh G-CSF)

Synonyms: CSF-3, MGI-1G, GM-CSF beta, Pluripoietin, Filgrastim, Lenograstim

Introduction: G-CSF is a cytokine that controls the production, differentiation and function of granulocytes. The active protein is found extracellularly. Three transcript variants encoding three different isoforms have been found for this gene. Granulocyte/ macrophage colony-stimulating factors are cytokines that act in hematopoiesis by controlling the production, differentiation and function of 2 related white cell populations of the blood, the granulocytes and the monocytes- macrophages. This CSF induces granulocytes.

Description: Recombinant human G-CSF produced in E.Coli is a single, non-glycosylated, polypeptide chain containing 174 amino acids and having a molecular mass of 18.7 kDa. rh G-CSF is purified by proprietary chromatographic techniques.

Source: Escherichia Coli

Physical Appearance: Sterile filtered white lyophilized (freeze-dried) powder.

Formulation: Lyophilisated from a 0.2 µm filtered solution in 25 mM sodium phosphate, 200 mM NaCl, pH 7.5. The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery

Solubility: It is recommended to reconstitute the lyophilized rh G-CSF in sterile H2O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

Stability: Lyophilized rh G-CSF although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh G-CSF 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: 95.0% as determined by SDS-PAGE.

Amino Acid Sequence: TPLGPASSLP QSFLKKCLE QVRKIQGDGA ALQEKLCATY KLCHPEELVL LGHSGLIPWA PLSSCPQLQL QLAGCSSLQH SGLFLYQGLL QALEGISPEL GPTLTQDLQD VADFATTIWQ QMEELGMAPA LQPTQGAMPA FASAFQRRAG GVLVASHLQS FLEVSYRVAL HLAQP

Biological Activity: Calculated by the dose-dependant proliferation of murine NFS-60 indicator cells the ED50 is < 0.1 ng/ml.

Endotoxin: The endotoxin level is less than 1 EU / µg determined by LAL method.

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Recombinant Human Granulocyte Macrophage Colony Stimulating Factor (rh GM-CSF)

**Synonyms:** CSF-2, MGI-1GM, GM-CSF, Pluripoietin-alpha, Molgramostin, Sargramostim.

**Introduction:** GMCSF is a cytokine that controls the production, differentiation and function of granulocytes and macrophages. The active form of the protein is found extracellularly as a homodimer. GM-CSF has been localized to a cluster of related genes at chromosome region 5q31, which is known to be associated with interstitial deletions in the 5q- syndrome and acute myelogenous leukemia. Other genes in the cluster include those encoding Interleukins 4, 5, and 13. GM-CSF stimulates the growth and differentiation of hematopoietic precursor cells from various lineages, including granulocytes, macrophages, eosinophils and erythrocytes.

**Description:** Recombinant human GM-CSF produced in *E.Coli* is a single, non-glycosylated, polypeptide chain containing 127 amino acids and having a molecular mass of 14477 Dalton. rh GM-CSF is purified by proprietary chromatographic techniques.

**Source:** *Escherichia Coli*.

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** lyophilized from a 0.22 µm filtered solution in 25 mM Sodiumphosphate, 200 mM NaCl, pH 7.5 The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery.

**Solubility:** It is recommended to reconstitute the lyophilized rh GM-CSF in sterile H₂O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh GM-CSF should be stored desiccated below -18° C. Upon reconstitution rh GM-CSF 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:** 95.0% as determined by SDS-PAGE (silver stain).

**Amino Acid Sequence:** MAPARSPPS TQPWEHVNAI QEARRLLNLNS RDTAAEMNET VEVIEMFDL QEPTCLQTRL ELYKQGLRGS LTKLGPTLT MASHYKQHCP PTPETSCATQ IITFESFKEN KDFLLVIPF DCWEPVQE

**Biological Activity:** Tested by its ability to promote proliferation of human TF-1 cells the specific activity is 0.9 x 10^7 IU/mg.

**Endotoxin:** The endotoxin level is less than 1 EU / µg determined by LAL method

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Recombinant Human Interferon Gamma (rh IFN-gamma)

Synonyms: Immune Interferon, Type II Interferon, T cell Interferon, MAF, IFG, IFI

Introduction: IFN-gamma produced by lymphocytes activated by specific antigens or mitogens. IFN-gamma, in addition to having antiviral activity, has important immunoregulatory functions, it is a potent activator of macrophages and has antiproliferative effects on transformed cells and it can potentiate the antiviral and antitumor of the type I interferons.

Description: Recombinant human IFN-gamma produced in E.Coli is a single, non-glycosylated, polypeptide chain containing 144 amino acids and having a molecular mass of 16.9 kDa. The rh IFN-gamma is purified by proprietary chromatographic techniques.

Source: Escherichia Coli.

Physical Appearance: Sterile filtered white lyophilized (freeze-dried) powder.

Formulation: Lyophilized from a 0.22 µm filtered solution in 25mM sodium phosphate, 200 mM NaCl, pH 7.5, The aliquots of 1µg contain Trehalose 5% (w/vol) for better recovery

Solubility: It is recommended to reconstitute the lyophilized rh IFN-gamma in sterile H₂O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

Stability: Lyophilized rh IFN-gamma although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh IFN-gamma 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 95.0% as determined by SDS-PAGE.

Amino Acid Sequence: MQDPYVKAEANLKKYFNAGH SDVADNGTFLGILKNWKEE SDRKIMQSQIVSFYFKLFKN FKDDQSIQKSVETIKEDMV KFFNSNKKRDDFEKLTNYS VTDLNVQRKAIHELQVMAE LSPAAXTGGKRRSQMLFRGR RASQ

Endotoxinity: The endotoxin level is less than 1 EU / µg determined by LAL method

Biological Activity: The specific activity as determined in a viral resistance assay is < 0.05 ng/ml, corresponding to a specific activity of 2.0 x 10⁷ IU/mg.

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Recombinant Human Interleukin-1 beta (rh IL-1b/IL1F2)

**Synonyms:** Catabolin, Lymphocyte-activating factor (LAF), Endogenous Pyrogen (EP), Leukocyte Endogenous Mediator (LEM), Mononuclear Cell Factor (MCF), IL1F2.

**Introduction:** Interleukin-1b is produced by activated macrophages. IL-1b stimulates thymocyte proliferation by inducing IL-2 release, b-cell maturation and proliferation and fibroblast growth factor activity. IL-1b proteins are involved in the inflammatory response being identified as endogenous pyrogens and are reported to stimulate the release of prostaglandin and collagenase from synovial cells.

**Description:** Recombinant human IL-1 beta produced in *E.Coli* is a non-glycosylated, polypeptide chain containing 153 amino acids and having a molecular mass of 17 kDa. The rh IL-1beta is purified by proprietary chromatographic techniques.

**Source:** *Escherichia Coli*

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilized from a 0.22µm filtered solution in 25 mM Phosphate buffer, 100 mM NaCl, pH 7.1. The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery

**Solubility:** It is recommended to reconstitute the lyophilized rh IL-1beta in sterile H2O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh IL-1beta although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh IL-1beta 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:** 95.0% as determined by SDS-PAGE / silver stain.

**Endotoxicity:** The endotoxin level is less than 1 EU/µg determined by LAL method

**Amino acid sequence:** APVRSLNCTL RDSQQKSLVM SGPYELKALH LQGQDMEQQV VFMSFVGGE ESNDKIPVAL GLKEKLYLS CVLKDDKPTL QLESVDPKNY PKKMEKRFV FNEKIEINNL EFESQFPNW YISTSQAENM PVFLGGTKGG QDITDFTMQF VSS

**Biological Activity:** The specific activity as determined in the test of augmentation of lymphocyte proliferation assay using mouse thymus was found to be 2.0 x 10^8 IU/ mg.

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Recombinant Human Interleukin-2 (rh IL-2)

Synonyms: T-cell growth factor (TCGF), Aldesleukin, Lymphokine

Introduction: IL-2 is a secreted cytokine that is important for the proliferation of T and B lymphocytes. The receptor of this cytokine is a heterotrimeric protein complex whose gamma chain is also shared by Interleukin 4 and Interleukin 7. The expression of this gene in mature thymocytes is monoallelic which represents an unusual regulatory mode for controlling the precise expression of a single gene. The targeted disruption of a similar gene in mice leads to ulcerative colitis-like disease which suggests an essential role of this gene in the immune response to antigenic stimuli.

Description: Recombinant human IL-2 produced in *Escherichia Coli* is a single, non-glycosylated polypeptide chain containing 134 amino acids and having a molecular mass of 15.5 kDa. The rh IL-2 is purified by proprietary chromatographic techniques.

Source: *Escherichia Coli*.

Physical Appearance: Sterile filtered white lyophilized (freeze-dried) powder.

Formulation: Lyophilised from a 0.22 µm filtered solution in 25 mM sodium phosphate, 500mM NaCl, pH 5.5. The aliquots/samples of 1µg contain Trehalose 5% (w/vol) for better recovery.

Solubility: It is recommended to spin down before reconstitution. Reconstitute the lyophilized rh IL-2 in sterile water to a concentration not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

Stability: Lyophilized rh IL-2 although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh IL-2 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 95.0% as determined by SDS-PAGE Silver stain.

Endotoxicity: The endotoxin level is less than 1 EU / µg determined by LAL method.

Amino acid Sequence: MAPTSSSTIKK TQLQLEHLLL DLQMILNGIN NYKNPKLTRM LTFKFYMPKK ATELKHLQCL EEELKPLEEV LNLAQSKNFH LRPRDLISNI NVIVLELKGS ETTFMCEYAD ETATIVEFLN RWITFCQSII STLT

Biological Activity: Determined by dose dependent stimulation of proliferation of murine CTLL-2 cells the specific activity is of 1 x 10^7 IU/mg.

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Recombinant Human Interleukin-3 (rh IL-3)

**Synonyms:** MCGF (Mast cell growth factor), Multi-CSF, HCGF, P-cell stimulation factor

**Introduction:** Rh IL-3 is a potent growth promoting cytokine. This cytokine is a species specific colony stimulating factor which stimulates colony formation of megakaryocytes, neutrophils, and macrophages from bone marrow cultures. Produced by T cells, mast cells and eosinophils, IL-3 enhances thrombopoieses, phagocytosis and antibody-mediated cellular cytotoxicity. Its ability to activate monocytes suggests that IL-3 may have additional immunoregulatory roles. Many of the IL-3 activities depend upon co-stimulation with other cytokines. It is involved in a variety of cell activities such as cell growth, differentiation and apoptosis. IL-3 has been also shown to possess neurotrophic activity and may be associated with neurologic disorders.

**Description:** Recombinant Human IL-3 produced in *E.Coli* is a single, non-glycosylated polypeptide chain containing 133 amino acids and having a molecular mass of 15 kDa. The rh IL-3 is purified by proprietary chromatographic techniques.

**Source:** *Escherichia Coli.*

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** lyophilized from a sterile 0.2µm filtrated solution in 50mM NaCl, ph 7.4. The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery

**Solubility:** It is recommended to reconstitute the lyophilized rh IL-3 in sterile H₂O not less than 100 µg/ml which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh IL-3 although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh IL-3 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 95.0% as determined by SDS-PAGE.

**Endotoxicity:** The endotoxin level is less than 1 EU/µg determined by LAL method

**Amino Acid Sequence:** APMTQTPPLK TSWVNCNMI DEIITHLKPQ PLPLLDFNML NGEDQDILME NNLRPRPNEA FNRAVKSQNL ASAIESILKN LLPCPLPLATA APTRHPIHIK DGDWNEFRRK LTFYLTLEN AQAQQTTLNL AIF

**Biological activity:** The ED50 as determined by dose-dependant stimulation of TF-1 cells is <0.1ng/ml.

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Recombinant Human Interleukin-4 (rh IL-4)

Synonyms: BCGF, BCDF, B cell stimulating factor, BSF-1, Lymphocyte stimulatory factor 1

Introduction: rh IL-4 is a pleiotropic cytokine produced by activated T cells. IL-4 is a ligand for Interleukin 4 receptor. The Interleukin 4 receptor also binds to IL-13 which may contribute to many overlapping functions of this cytokine and IL-13. STAT6, a signal transducer and activator of transcription, has been shown to play a central role in mediating the immune regulatory signal of this cytokine. This gene, IL-3, IL-5, IL-13 and GM-CSF form a cytokine gene cluster on chromosome 5q, with this gene particularly close to IL-13. IL-4, IL-13 and IL-5 are found to be regulated coordinately by several long-range regulatory elements in an over 120 kilobase range on the chromosome. Two alternatively spliced transcript variants of this gene encoding distinct isoforms have been reported.

Description: Recombinant human IL-4 produced in *E.Coli* is a single, non-glycosylated polypeptide chain containing 130 amino acids and having a molecular mass of 15 kDa. The rh IL-4 is purified by proprietary chromatographic techniques.

Source: *Escherichia Coli*.

Physical Appearance: Sterile filtered white lyophilized (freeze-dried) powder.

Formulation: 0.22 µm filtered solution in 25 mM sodium phosphate, 200 mM NaCl, pH 6.5
The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery

Solubility: It is recommended to reconstitute the lyophilized rh IL-4 in sterile H₂O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

Stability: Lyophilized rh IL-4 although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution rh IL-4 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 95.0% as determined by SDS-PAGE.

Amino acid sequence: The sequence of the first five N-terminal amino acids was determined and was found to be Met-His-Lys-Cys-Asp.

Biological Activity: The specific activity is > 23.0 x 10⁶ IU/mg.

Endotoxicity: The endotoxin level is less than 1 EU / µg determined by LAL method

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Recombinant Human Interleukin-5 (rh IL-5)

**Synonyms:** T-cell replacing factor (TRF), Eosinophil differentiation factor (EDF), B cell differentiation factor II (BCDFII)

**Introduction:** The protein encoded by this gene is a cytokine that acts as a growth and differentiation factor for both B cells and eosinophils. Interleukin 5 is a main regulator of eosinopoiesis, eosinophil maturation and activation. The elevated production of IL-5 is reported to be related to asthma or hypereosinophilic syndromes. The receptor of IL-5 is a heterodimer whose beta subunit is shared with the receptors for Interleukine 3 and colony stimulating factor 2 (GM-CSF). This gene, together with those for Interleukin 4, Interleukin 13 and GM-CSF form a cytokine gene cluster on chromosome 5. IL-5 ,IL-4 and IL-13 are found to be regulated coordinately by long-range regulatory elements spread over 120 kilobases on chromosome 5q31.

**Description:** Recombinant human IL-5 produced in *E.Coli* is a single, non-glycosylated polypeptide chain containing 113 amino acids and having a molecular mass of 26.5 kDa. The rh IL-5 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 (1 mg/ml) solution with no additives. The aliquotes of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery

**Solubility:** It is recommended to reconstitute the lyophilized rh IL-5 in sterile H$_2$O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh IL-5 although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution rh IL-5 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% HSS or BSA). Please prevent freeze-thaw cycles.

**Purity:** Greater than 97.0% as determined by RP-HPLC and by SDS-PAGE.

**Amino acid sequence:** IPTEIPTSAL VKETLALLST HRTLLIANET LRIPVPVHKN HQLCTEEIFQ GIGTLESQTV QGGTVERLFK NLSLIKKYID GQKKKCGEER RRVNQFLDYL QEFLGVMNTE WIIES

**Biological Activity:** The ED$_{50}$ as determined by the dose-dependant stimulation of the proliferation of TF-1 cells was found to be < 0.15ng/ml, corresponding to a specific activity of 6x 10$^{6}$ IU/mg.

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Recombinant Human Interleukin 6 (rh IL-6)

**Synonyms:** B cell differentiation factor (BCDF), HSF, MGI-2, B-cell stimulatory factor 2 (BSF-2), Hybridoma growth factor (HPGF), CTL differentiation factor (CDF)

**Introduction:** IL-6 is a pleiotropic cytokine that plays important roles in acute phase reaction, antigen specific immune responses and hematopoiesis. Main sources of Interleukin-6 are monocytes, T-cells, fibroblasts and endothelial cells. IL-6 is a major mediator of acute phase reaction, it functions as B-cell differentiation factor (BCDF) and induces the proliferation of thymocytes. Moreover it has neurotrophic activity on certain neuronal cell types. IL-6 is also known to act as autocrine growth modulator of some tumor types.

**Description:** Recombinant human IL-6 produced in *E.Coli* is a variably glycosylated polypeptide chain containing 185 amino acids with alpha-helical structure and having a molecular mass of 21 kDa. The rh IL-6 is purified by proprietary chromatographic techniques.

**Source:** Escherichia Coli.

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilised from a 0.22 µm filtered carrier free solution in PBS pH 7.5 containing 0.25 M NaCl The aliquots of 1µg contain Trehalose 5% (w/vol) for better recovery

**Solubility:** It is recommended to reconstitute the lyophilized rh IL-6 in sterile H2O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh IL-6 although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh IL-6 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 95.0% as determined by SDS-PAGE.

**Endotoxicity:** The endotoxin level is less than 1 EU/µg determined by LAL method

**Amino acid sequence:**

```
MPVPPGEDSKDVAAPHRQPLTSSERIDQIYILDGISALRKETCNKSNMCESSKEALAENNLNPMAEKDGC
FQSFNEETCLVKITGELFEVLEYLQRNFRSEESQARAVQMVSTKVLQFKKAKNLDAITTPDPTTNASLTK
LQAQNQWLQDMTTHLILRSFKEFLQSSLRALRQM
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**Biological Activity:** The ED50 as determined by the dose-depantant stimulation of murine 7TD1 cells is < 0.1 ng/ml, corresponding to a specific activity of > 0.5x 10^8 IU/mg.

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Recombinant Human Interleukin-7 (rh IL-7)

**Synonyms:** Lymphopoietin 1 (LP-1), pre-B cell factor.

**Introduction:** IL-7 is a cytokine important for B and T cell development. This cytokine and the hepatocyte growth factor (HGF) form a heterodimer that functions as a pre-pro-B cell growth-stimulating factor. IL-7 is found to be a cofactor for V(D)J rearrangement of the T cell receptor beta (TCRB) during early T cell development. IL-7 can be produced locally by intestinal epithelial and epithelial goblet cells and may serve as a regulatory factor for intestinal mucosal lymphocytes. Knockout studies in mice suggested that IL-7 plays an essential role in lymphoid cell survival.

**Description:** Recombinant human IL-7 produced in *E.Coli* is a single, non-glycosylated polypeptide chain containing 153 amino acids and having a molecular mass of 17.4 kDa. The rh IL-7 is purified by proprietary chromatographic techniques.

**Source:** *Escherichia Coli*.

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilized from a 0.22 µm filtered solution in 25 mM Sodiumphosphate, 200 mM NaCl, pH 6.5. The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery.

**Solubility:** It is recommended to reconstitute the lyophilized rh IL-7 in sterile H2O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh IL-7 although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh IL-7 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 95.0% as determined by SDS-PAGE / silver stain.

**Endotoxicity:** The endotoxin level is less than 1 EU/µg determined by LAL method.

**Amino acid sequence:**
```
MDCDIEGKDG KQYESVLMVS IDQLLDSMKE IGSNCLNNEF NFFKRHICDA NKEGMFLFRA ARKLRQFLKM NSTGDFDLHL LKVSEGTTIL LNCTGQVKGR KPAALGEAQP TKSLEENKSL KEQKKLNLDLC FLKRLLOEIK TCWNKILMGTEKEH
```

**Biological Activity:** The ED50 as determined by the dose-dependant stimulation of murine IXN/2B cells is < 0.5 ng/ml, corresponding to a Specific Activity of 2 x 10^6 IU/mg.

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Recombinant Human Interleukin-8 /1-77a.a. (rh IL-8 /1-77a.a. / CXCL8)

**Synonyms:** Monocyte-derived neutrophil chemotactic factor, MDNCF, T-cell chemotactic factor, Neutrophil-activating protein 1, NAP-1, Granulocyte chemotactic protein 1, GCP-1, Monocyte-derived neutrophil-activating peptide, MONAP, Emocatin, K60, NAF, LECT, LUCT, 3-10C, LYNAPE, SCYB8, TSG-1, AMCF-I, b-ENAP.

**Introduction:** Interleukin-8 (IL-8) is a chemokine produced by macrophages and other cell types such as epithelial cells. It is also synthesized by endothelial cells which store IL-8 in their storage vesicles, the Weibel-Palade bodies. When first encountering an antigen the primary cells to encounter it are the macrophages who phagocytose the particle. Upon processing they release chemokines to signal other immune cells to come in to the site of inflammation. IL-8 is one such chemokine. It serves as a chemical signal that attracts neutrophils at the site of inflammation, and therefore is also known as Neutrophil Chemotactic Factor.

**Description:** Recombinant human IL-8/1-77a.a. produced in *E.Coli* is a single, non-glycosylated, polypeptide chain containing 77 amino acids and having a molecular mass of 8.9 kDa. rh IL-8 is purified by proprietary chromatographic techniques.

**Source:** *Escherichia Coli.*

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilized from a 0.22µm filtered solution in 25 mM Sodiumphosphate, pH 6.5. The aliquots/samples of 1µg contain Trehalose 5% (w/vol) for better recovery.

**Solubility:** It is recommended to reconstitute the lyophilized rh IL-8 in sterile H2O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh IL-8 although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh IL-8 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:** 95.0% as determined by SDS-PAGE.

**Amino acid sequence:** AVLPRSAKEL RCQCIKTYSK PFHPKFIKEL RVIESGPHTC NTEIIVKLSD GRELCEDPKE NWVQVRVKEKF LKRAENS

**Biological Activity:** rh IL-8/1-77a.a. is fully biologically active - tested by its capability to chemoattract human peripheral neutrophils using a concentration range of 10-100 ng/ml.

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Recombinant Human Interleukin-9 (rh IL-9)

**Synonyms:** T-cell growth factor p40, P40 cytokine.

**Introduction:** IL-9 is an immunoregulatory cytokine produced by IL-2 activated Th2 lymphocytes. IL-9 enhances the proliferation of T lymphocytes, mast cells, erythroid precursor cells and megakaryoblastic leukemia cell lines. Over-expression of IL-9 has been implicated in the pathogenesis of anaplastic lymphoma and Hodgkin's disease. Whereas murine IL-9 can function on human cells, human IL-9 is inactive on mouse cells. IL-9 is a glycoprotein with a molecular weight of 32-39 that is derived from T-cells and maps to human chromosome 5.

**Description:** Recombinant human IL-9 produced in *E.Coli* is a single, non-glycosylated single polypeptide chain containing 127 amino acids and having a molecular mass of 14 kDa. The rh IL-9 is purified by proprietary chromatographic techniques.

**Source:** *Escherichia Coli*.

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilized from a 0.2µm filtered solution in PBS, pH 7.4. The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery.

**Solubility:** It is recommended to reconstitute the lyophilized rh IL-9 in sterile water not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh IL-9 although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh IL-9 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 95.0% as determined by SDS-PAGE.

**Amino acid Sequence:** MQGCPTLAGI LDINFLINKM QEDPASKCHC SANVTSCLCL GIPSDNCTRPGFSERLSQMT NTTMQTRYPL IFSRVKKSVE VLKNKNKCPYF SCEQPCNQTT AGNALTFLKS LLEIFQKEKM RGMRGKI.

**Biological Activity:** The ED₅₀ as determined by the dose-dependant stimulation of human MO7e cells is less than 0.2 ng/ml.

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Recombinant Human Interleukin-10 (rh IL-10)

Synonyms: B-TCGF, TGIF, IL10A, Cytokine synthesis inhibitory factor (CSIF).

Introduction: IL-10 is a cytokine produced primarily by monocytes and to a lesser extent by lymphocytes. This cytokine has pleiotropic effects in immunoregulation and inflammation. It down-regulates the expression of Th1 cytokines, MHC class II Ags and costimulatory molecules on macrophages. It also enhances B cell survival, proliferation and antibody production. This cytokine can block NF-kappa B activity and is involved in the regulation of the JAK- SATA signaling pathway. Knockout studies in mice suggested the function of this cytokine as an essential immunoregulator in the intestinal tract. Human IL-10 active on murine cells, but murine IL-10 is inactive on human cells.

Description: Recombinant human IL-10 produced in E. coli is an 18.6 kDa protein of 161 amino acid residues. The rh IL-10 is purified by proprietary chromatographic techniques.

Source: Escherichia Coli

Physical Appearance: Sterile filtered white lyophilized (freeze-dried) powder. The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery.

Formulation: The protein was lyophilized from a sterile 0.2µm filtrated solution containing 25mM sodium phosphate, pH 6.5 + 200mM NaCl.

Solubility: It is recommended to reconstitute the lyophilized rh IL-10 in sterile H2O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

Stability: Lyophilized rh IL-10 although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution rh IL-10 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 95.0% as determined by SDS-PAGE.

Amino Acid Sequence: MSPGQGTQSE NSCTHFPGNL PNMLRDLRDA FSRVKTFQOM KDQLDNLLLK ESSLERFKGY LGQQALSEMI QFYLEEVMPQ AENQPDIAK HVNSLGRENKL TLRLRLRRCH RFLPCEKNSK AVEQVKNAFN KLQEKGKYYA MSEFDIFIN YIEAYMTMKIR N

Endotoxicity: The endotoxin level is less than 1 EU/µg determined by LAL method

Biological Activity: Determined by its ability to stimulate proliferation of murine MC/9 cells. The ED50 was found to be ≤ 2.0 ng/ml, corresponding to a specific activity of ≥ 5 x 10^5 IU/mg

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Recombinant Human Interleukin-11 (rh IL-11)

Synonyms: AGIF, Adipogenesis Inhibitory Factor, Oprelvekin

Introduction: IL-11 is a member of the Glycoprotein-130 family (gp130) of cytokines. These cytokines drive the assembly of multisubunit receptor complexes which all contain at least one molecule of the transmembrane signaling receptor gp130 (IL-6ST). IL-11 is shown to stimulate the T-cell-dependent development of immunoglobulin-producing B cells. It is also found to support the proliferation of hematopoietic stem cells and megakaryocyte progenitor cells.

Description: Recombinant human IL-11 produced in *E.Coli* is a single, non-glycosylated polypeptide chain containing 179 amino acids and having a molecular mass of 19.25 kDa. The rh IL-11 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 (1 mg/ml) solution with no additives. The aliquotes of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery

Solubility: It is recommended to reconstitute the lyophilized rh IL-11 in sterile H₂O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

Stability: Lyophilized rh IL-11 although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution rh IL-11 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 RP-HPLC and by SDS-PAGE.

Amino acid sequence: The sequence of the first five N-terminal amino acids was determined and was found to be Gly-Pro-Pro-Pro-Gly. N-terminal methionine has been completely removed enzymatically.

Biological Activity: The ED₅₀ as determined by the dose-dependant stimulation of the proliferation of murine 7TD1 cells was found to be < 10 ng/ml, corresponding to a specific activity of 1x 10^5 IU/mg

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Recombinant Human Interleukin-12 (rh IL-12)

**Synonyms:** NKSF, CTL maturation factor (TCMF), Cytotoxic lymphocyte maturation factor (CLMF), TSF, synonyms: NKSF, CTL maturation factor (TCMF), Cytotoxic lymphocyte maturation factor (CLMF), TSF

**Introduction:** IL-12 is a potent regulator of cell mediated immune responses and it induces IFN-γ production by NK and T cells. It is produced by activated monocytes/macrophage cells, B lymphocytes and connective tissue type mast cells. Among its biological activities IL-12 promotes the growth and activity of activated NK, CD4+ and CD8+ cells and induces the development of IFN-γ producing Th1 cells.

**Description:** Recombinant human IL-12 produced in HEK cells is a glycosylated heterodimer having a molecular weight of 57 kDa. The rh IL-12 is purified by proprietary chromatographic techniques.

**Source:** HEK cells

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** lyophilized from a 0.2µm filtered solution in PBS. The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery

**Solubility:** It is recommended to reconstitute the lyophilized rh IL-12 in sterile H₂O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh IL-12 although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh IL-12 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 95.0% as determined by SDS-PAGE.

**Endotoxicity:** The endotoxin level is less than 1 EU / µg determined by LAL method.

**Amino Acid Sequence:**

RNLPVA TPDPGMFPCL HHSQNLRAV SNMLOKART QLEFYPCTSEE IDHEDITKDK TSTVEACLPL EMTKVSCMLN SRETSFITNG SCLASRKTSF MMALCLISSI EDLKYOFQVE KTMNKA LMD PKRQIFLDQN MLAVIDELMQ ALNFNSETVP QKSSLEEPDF YKTIKLCL LHAFRIRAVT IDRVMYSYNA S IWLKEL DYYVVELDWDY PDADGEMMV TCDTPEEDGI TWTLDQSEV LGSQKTLIQ VKEFGDAGQY TCHKGGEVLH SLHLLLHKE DGIWSTDLIK DQKEPKNTKF LRCBEKNSG RFTCWWLTTI STRLFSVKS SRGSSDPQGV TCAGATLSAE VRGQNEYE YSVECQEDSA CPOAESLP EVMVDHAVKLY KENYHTSSF IRDIKPDDP KNLQKPLKN SRQVESWEY PDTWSTPHSY FSLTFCVQVQ GSKKREKKDR VFTDKTSATV ICRRNASIVS RQDRYYSSS WSEWASVPCS

**Biological Activity:** Determined by dose dependent release of rh IFN-gamma from NK cells in co-stimulation with IL-18 the ED₅₀ was determined to be less than 1 ng/ml, corresponding to a specific activity of 1 x10⁶ IU/mg.

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Recombinant Human Interleukin-13 (rh IL-13)

**Synonyms:** NC30 (human), P600 (murine)

**Description:** IL-13 is an immunoregulatory cytokine produced primarily by activated Th2 cells. IL-13 is involved in several stages of B-cell maturation and differentiation. It regulates CD23 and MHC class II expression up and promotes IgE isotype switching of B cells. IL-13 regulates macrophage activity down and inhibits thereby the production of pro-inflammatory cytokines and chemokines. IL-13 is found to be critical to the pathogenesis of allergen-induced asthma, but operates through mechanisms independent of IgE and eosinophils. IL-13, IL-3, IL-4, IL-5, and GM-CSF form a cytokine gene cluster on chromosome 5q, with this gene particularly close to IL-4.

**Description:** Recombinant human IL-13 produced in *E. Coli* is a single, non-glycosylated polypeptide chain containing 114 amino acids and having a molecular mass of 12.5 kDa. The rh IL-13 is purified by proprietary chromatographic techniques.

**Source:** *Escherichia Coli*.

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilized from a 0.22 µm filtered solution in 50 mM Tris, 50 mM NaCl, pH 8.0. The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery.

**Solubility:** It is recommended to reconstitute the lyophilized rh IL-13 in sterile H₂O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh IL-13 although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh IL-13 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 95.0% as determined by SDS-PAGE silver stained gel.

**Endotoxicity:** The endotoxin level is less than 1 EU/µg determined by LAL method.

**Amino acid sequence:** SPGPVPPSTA LRELIEELVN ITQNQKAPLC NGSMVWSINL TAGMYCAALE SLINVSGCSA IEKTQRMLSG FCPHKVSAQ FSSLHVRDTK IEVAQFVKDL LLHLKKLFRE GQFN

**Biological Activity:** The ED₅₀ as determined by the dose-dependant proliferation of TF-1 cells is < 1ng/ml, corresponding to a specific activity of >1 x 10⁶ IU/mg.

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Recombinant Human Interleukin-15 (rh IL-15)

**Synonyms:** MGC9721.

**Introduction:** IL-15 regulates T and natural killer cell activation and proliferation. IL-15 and IL-2 share many biological activities. They are found to bind common hematopoietin receptor subunits, may compete for the same receptor and thus negatively regulate each other's activity. The number of CD8+ memory cells is shown to be controlled by a balance between IL-15 and IL-2. IL-15 induces the activation of JAK kinases as well as the phosphorylation and activation of transcription activators STAT3, STAT5, and STAT6. Studies of the mouse counterpart suggested that IL-15 may increase the expression of apoptosis inhibitor BCL2L1/BCL-x(L), possibly through the transcription activation activity of STAT6 and thus prevent apoptosis. Two alternatively spliced transcript variants of this gene encoding the same protein have been reported.

**Description:** Recombinant human IL-15 produced in *E. Coli* is a single, non-glycosylated polypeptide chain containing 114 amino acids and having a molecular mass of 13007 Dalton. rh IL-15 is purified by proprietary chromatographic techniques.

**Source:** *Escherichia Coli.*

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** lyophilized from a 0.22 µm filtered solution in 25 mM sodium acetate, 300 mM NaCl, pH 7.5. The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery

**Solubility:** It is recommended to reconstitute the lyophilized rh IL-15 in sterile H2O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh IL-15 although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh IL-15 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:** 95.0% as determined by SDS-PAGE Silver Stained gel.

**Amino acid sequence:** MNWVNVISDL KKIEDLIQSM HIDATLYTES DVHPSCKVTA MKCFLELQV ISLESGDASI HDTVENIL ANNSLSSNGN VTESGCKECE ELEEKNIKEF LQSFVHIVQM FINTS

**Biological Activity:** Tested by its capability to promote proliferation of murine lymphoblast cell line CTLL-2 rh IL-15 has a biological activity of ≥ 8x10^6 IU/mg

**Endotoxin:** The endotoxin level is less than 0.1 ng per µg (1EU/µg) determined by LAL method

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Recombinant Human Interleukin-17A (rh IL-17A)

**Synonyms:** IL-17, Cytotoxic T-lymphocyte-associated antigen 8 (CTLA-8).

**Introduction:** IL-17 is a proinflammatory cytokine produced by activated T cells. IL-17 regulates the activities of NF-kappaB and mitogen-activated protein kinases. IL-17 can stimulate the expression of IL-6 and Cyclooxygenase-2 (COX-2) as well as enhance the production of nitric oxide (NO). High levels of IL-17 are associated with several chronic inflammatory diseases including rheumatoid arthritis, psoriasis and multiple sclerosis.

**Description:** Recombinant human IL-17A produced in *E.Coli* is a homodimeric, non-glycosylated polypeptide chain containing a total of 264 amino acids and having a molecular mass of 30.25 kDa. The rh IL-17A is purified by proprietary chromatographic techniques.

**Source:** *Escherichia Coli*.

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilized from a 0.22 µm filtered solution in 25 mM sodium phosphate, 200 mM NaCl, pH 7.4. The aliquots/samples of 1µg contain Trehalose 5% (w/vol) for better recovery.

**Solubility:** It is recommended to reconstitute the lyophilized rh IL-17A in sterile H2O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh IL-17A although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution rh IL-17A 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% HSS or BSA). Please prevent freeze-thaw cycles.

**Purity:** 95.0% as determined by SDS-PAGE silver stained gel.

**Endotoxin:** The endotoxin level is less than 1 EU / µg determined by LAL method.

**Amino Acid Sequence:**

```
MIVKAGITIP RNPGCPNSED KNFPRTVMVN LNIHNRNTNT NPKRSSDDYNY RSTSPWNLHR NEDPERYPSV IWEAKCRHLG CINADGNVDY HMNSVPIQEE ILVLRREPPH CPNSFRLEKI LVSVGCTCVT PIVHHVA
```

**Biological Activity:** The biological activity of rec. human IL-17A was tested by dose dependant stimulation of IL-6 secretion on human fibroblasts. The specific activity is ≥ 5 x 10^5 IU/mg.

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Recombinant Human Interleukin-17F (rh IL-17F)

**Synonyms:** Cytokine ML-1, Interleukin-17F precursor

**Introduction:** IL-17F is a cytokine that shares sequence similarity with IL17. IL-17F is expressed by activated T cells and has been shown to stimulate the production of several other cytokines, including IL6, IL8, and GM-CSF. IL-17F inhibits the angiogenesis of endothelial cells and induces endothelial cells to produce IL2, TGFβ1/TGFB, and monocyte chemoattractant protein-1. IL-17F induces stromal cells to produce proinflammatory and hematopoietic cytokines. Intestinal IL17F gene expression is increased in active CD. IL-17A & IL-17F alleles influence the susceptibility to and pathophysiological features of ulcerative colitis independently. IL-17F and MIF gene polymorphisms are significantly associated with the development of functional dyspepsia. The initiation of IL-17F/IL-17R signaling pathway requires the receptor ubiquitination by TRAF6. IL-17F induces expression of IFN-gamma-inducible protein 10 (IP-10) by activating Raf1-mitogen-activated protein kinase 1/2-extracellular-regulated kinase 1/2-p90 ribosomal S6 kinase-cyclic AMP response element-binding protein signaling pathway.

**Description:** Recombinant human Interleukin-17F produced in E.Coli is a homodimeric, cysteine linked, non-glycosylated polypeptide chain containing 2 x 134 amino acids and having a total molecular mass of 30.1 kDa. The human IL-17F is purified by proprietary chromatographic techniques.

**Source:** Escherichia Coli

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilized from a 0.22 µm filtered solution in 25 mM Sodiumphosphate, 200 mM NaCl, pH 7.0 The aliquots/samples of 1µg contain Trehalose 5% (w/vol) for better recovery

**Solubility:** It is recommended to reconstitute the lyophilized rh IL-17F in sterile H2O not less than 1mg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh IL-17F although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution rh IL-17F 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% HSS or BSA). Please prevent freeze-thaw cycles.

**Purity:** 95.0% as determined by SDS-PAGE silver stained gel.

**Endotoxicity:** The endotoxin level is less than 1 EU / µg determined by LAL method

**Amino acid sequence:** MRKIPKVGH TFFQPESCPP VPGGSMKLDI GIINENQRVS MSRDNIESRT SPWNYTVTWD PNRPSEVVQ AQCRNLGCIN AQGKEDISMN SVPIQQETLV VRRKHQGCSV SFQLEKVLVT VGCTCVTPVI HHVQ

**Biological Activity:** rh IL-17F is fully biologically active tested by stimulation of IL-6 production by normal human dermal fibroblasts - NHDFs.

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Recombinant Human Interleukin-19 (rh IL-19)

**Synonyms:** Melanoma differentiation association like protein, MDA1, NG.1, ZMDA1, IL-10C.

**Introduction:** IL-19 is a cytokine that belongs to the IL-10 cytokine subfamily. IL-19 is found to be preferentially expressed in monocytes. It can bind the IL-20 receptor complex and lead to the activation of the signal transducer and activator of transcription 3 (STAT3). A similar cytokine in mouse is reported to regulate the expression of IL-6 and TNF-alpha up and to induce apoptosis which suggests a role of IL-19 in inflammatory responses. Alternatively spliced transcript variants encoding the distinct isoforms have been described.

**Description:** Recombinant human IL-19 produced in *E. Coli* is a single, non-glycosylated polypeptide chain containing 155 amino acids and having a molecular mass of 17.9 kDa. Rh IL-19 is purified by proprietary chromatographic techniques.

**Source:** *Escherichia Coli*.

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilized from a concentrated solution in water containing 10mM sodium citrate pH 5.0. The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery.

**Solubility:** It is recommended to reconstitute the lyophilized rh IL-19 in sterile H₂O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh IL-19 although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh IL-19 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 95.0% as determined by SDS-PAGE.

**Amino acid sequence:** The sequence of the first five N-terminal amino acids was determined and was found to be Met-Leu-Arg-Arg-Cys.

**Endotoxicity:** The endotoxin level is less than 1 EU / µg determined by LAL method

**Biological Activity:** The activity is determined by its ability to activate STAT following receptor-ligand interaction.

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**Recombinant Human Interleukin-20 (rh IL-20)**

**Synonyms:** IL10D, ZCYTO10, Four alpha helix cytokine Zcyto10.

**Introduction:** IL-20 is a cytokine structurally related to Interleukin 10. IL-20 has been shown to transduce its signal through signal transducer and activator of transcription 3 (STAT3) in keratinocytes. A specific receptor for IL-20 is found to be expressed in skin and upregulated dramatically in psoriatic skin, suggesting a role for this protein in epidermal function and psoriasis.

**Description:** Recombinant human IL-20 produced in *E.Coli* is a single, non-glycosylated homodimeric polypeptide chain containing 2 x 153 amino acids and having a total molecular mass of 35.212 Dalton. The rh IL-20 is purified by proprietary chromatographic techniques.

**Source:** *Escherichia Coli*.

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilized from a 0.22 µm filtered solution in 25 mM sodium phosphate, 200 mM NaCl, pH 6.5. The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery.

**Solubility:** It is recommended to reconstitute the lyophilized rh IL-19 in sterile H₂O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh IL-20 although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh IL-20 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 95.0% as determined by SDS-PAGE.

**Amino acid sequence:** MLKTLNLGSC VIATNLQEIR NGFSEIRGSV QAKDGNIDIR ILRRTESLQD TKPANRCCLL RHLRLRYLDR VFKNYQTPDH YTLPKISSL A NSFLLIKDL RLCHAHMTCH CGEEAMKKYS QILSHFEKLE PQAAVVKALG ELDILLQWME ETE

**Biological Activity:** The biological activity was tested by hIL-20 induced reporter gene expression in hIL-20R transfected Ba/F3 cells.

**Endotoxin:** The endotoxin level is less than 1 EU / µg determined by LAL method.

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**Recombinant Human Interleukin-21 (rh IL-21)**

**Synonyms:** Za11

**Introduction:** IL-21 is produced by CD4+ T cells in response to antigenic stimulation. Its action enhances antigen-specific responses of immune cells. The biological effects of IL-21 include induction of differentiation of T-cells-stimulated B-cells into plasma cells and memory B-cells, stimulation (in conjunction) with IL-4 of IgG production and induction of apoptotic effects in naïve and stimulated B-cells in the absence of T-cell signaling. IL-21 additionally promotes the anti-tumor activity of CD8+ T-cells and NK cells. IL-21 exerts its effect through binding to a specific type I cytokine receptor, IL-21R, which also contains the gamma chain (γc) found in other cytokine receptors including IL-2, IL-4, IL-7, IL-9 and IL-15. The IL-21/IL-21R interaction triggers a cascade of events which includes activation of the tyrosine kinases JAK1 and JAK3, followed by activation of the transcription factors STAT1 and STAT3.

**Description:** Recombinant human IL-21 produced in *E.Coli* is a single, non-glycosylated polypeptide chain containing 133 amino acids and having a molecular mass of 15.4 kDa. The rh IL-21 is purified by proprietary chromatographic techniques.

**Source:** *Escherichia Coli*.

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilized from PBS, ph 7.4. The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery

**Solubility:** It is recommended to reconstitute the lyophilized rh IL-21 in sterile H2O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh IL-21 although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh IL-21 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 97.0% as determined by SDS-PAGE.

**Amino acid sequence:** MQDRHMIRMR QLIDIVDQLK NYVNDLVPEF LPAPEDVTN CEWSAFSCFQ KAQLKSANTG NNERIINVSI KKLKRKPPST NAGRRQKHRL TCPSCDSYEK KPPKEFLERF KSLLQKMIHQ HLSSRTHGSE DS

**Biological Activity:** The ED50 is 1 - 10ng/ml corresponding to a specific activity of 0.1 – 1x 10^6 IU/mg , determined by the dose-dependant proliferation of human peripheral blood mononuclear cells.

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Recombinant Human Interleukin-22 (rh IL-22)

Synonyms: IL-TIF, TIFa, IL-10-related T-cell-derived-inducible factor, ILTIF, IL-D110, zcyto18, TIFIL-23.

Introduction: IL-22 is a member of the IL-10 family of regulatory cytokines. Members of this family share partial homology in their amino acid sequences, but they are dissimilar in their biological functions. Produced by T lymphocytes, IL-22 inhibits IL-4 production by Th2 cells and induces acute phase reactants in the liver and pancreas. IL-22 signals through a receptor system consisting of IL-10R-beta/CRF2-4 and IL-22R, both of which are members of the class II cytokine-receptor family.

Description: Recombinant human IL-22 produced in E.Coli is a single, non-glycosylated, homodimeric polypeptide chain containing 2x146 amino acids and having a molecular mass of 33.6 kDa. Rh IL-22 is purified by proprietary chromatographic techniques.

Source: Escherichia Coli

Physical Appearance: Sterile filtered white lyophilized (freeze-dried) powder.

Formulation: Lyophilized from a 0.22 µm filtered solution in 25 mM Sodiumphosphate, 200 mM NaCl, pH 6.0. The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery.

Solubility: It is recommended to reconstitute the lyophilized rh IL-22 in sterile water not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

Stability: Lyophilized rh IL-22 although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution rh IL-22 should be stored at 4°C between 2-7 days, 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 95.0% as determined by SDS-PAGE.

Amino acid sequence: MAPISSHCRL DKSNFQPYI TNRTFMLAKE ASLADNTDV RLIGEEKFHG VSMSERCYLK QVLNFTLEE VLFPQSDRFQ PYMQEVVPFL ARLSNRLSTC HIEGDDLHIQ RNVQKLDKTV KKLGESGEIK AIGELDLLFM SLRNACI

Endotoxin: The endotoxin level is less than 1 EU / µg determined by LAL method.

Biological Activity: The biological activity was determined by the ability to activate STAT following receptor ligand interaction.

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Recombinant Human Interleukin-24 (rh IL-24 / IL-10B)

**Synonyms:** Suppression of Tumorigenicity 16 protein (ST16), Melanoma Differentiation-Associated gene 7 protein (MDA-7), C49A, FISP, Mob-5.

**Introduction:** IL-24 is a member of the IL-10 family of cytokines. It was identified as a gene induced during terminal differentiation in melanoma cells. IL-24 encoded can induce apoptosis selectively in various cancer cells. Overexpression IL-24 leads to elevated expression of several GADD family genes which correlates with the induction of apoptosis. The phosphorylation of mitogen-activated protein kinase 14 (MAPK7/P38) and heat shock 27 kDa protein 1 (HSB2/HSP27) are found to be induced by this gene in melanoma cells, but not in normal immortal melanocytes. Alternatively spliced transcript variants encoding distinct isoforms have been reported. The glycosylation is essential for activity of IL-24. IL-24 has diverse functional activities. At low concentrations it induces type I proinflammatory cytokines such as IFN-γ, IL-1β, IL-12 and TNF-α. At high concentration it is a strong inducer of apoptosis in tumor cells, but not normal cells. IL-24 is being hailed as a “magic bullet” for cancer gene therapy.

**Description:** Recombinant human IL-24 produced in yeast is a single, glycosylated, polypeptide chain containing 158 amino acids and having a molecular mass of 18 kDa. As a result of glycosilation, the protein migrates at 19.5 kDa on SDS-Page.

**Source:** Saccharomyces cerevisiae

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilized from a 0.2µm filtered solution in PBS with BSA. The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery.

**Solubility:** It is recommended to reconstitute the lyophilized rh IL-24 in sterile water not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh IL-24 although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution rh IL-24 should be stored at 4°C between 2-7 days, 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 RP-HPLC and by SDS-PAGE.

**Biological Activity:** Measured by its ability to bind to the cell receptor of Capan-1 cells resulted in STAT3 activation. The ED$_{50}$ for this effect is typically 1.0 ng/ml.

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Recombinant Human Interleukin-31 (rh IL-31)

Introduction: IL-31 produced by activated Th2-type T cells, cooperates with a heterodimeric receptor consisting of IL-31 Receptor Anatagonist and Onconstatin-M Receptor that is continuously expressed on epithelial cells and keratinocytes. IL-31 plays a role in the promotion of allergic skin disorders and in regulating other allergic diseases such as asthma. IL-31 is involved in the itching sensation and endorses the scratching behavior in NC/Nga mice with atopic dermatitis. IL-31 expression is connected with CLA(+) T cells and contributes to the development of atopic dermatitis-induced skin inflammation and pruritus. IL-31 is a powerful inducer of proinflammatory mediators in human colonic SEMFs and takes part as a proinflammatory cytokine derived from Th2 cells. Serum IL-31 levels are higher in patients with atopic dermatitis. IL-31 is involved in a broad range of immune- and non-immune cells and possesses potential pleiotropic physiological functions -including regulating hematopoiesis and immune response- causing inflammatory bowel disease, airway hypersensitivity and dermatitis.

Description: Recombinant human Interleukin-31 produced in E.Coli is a single, non-glycosylated, polypeptide chain containing 141 amino acids (24-164 a.a.) and having a molecular mass of 15.8 kDa.

Source: Escherichia Coli

Physical Appearance: Sterile filtered white lyophilized (freeze-dried) powder.

Formulation: Lyophilised from a 0.22 µm filtered solution in PBS pH 7.4
The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery

Solubility: It is recommended to reconstitute the lyophilized rh IL-31 in sterile water not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

Stability: Lyophilized rh IL-31 although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution rh IL-31 should be stored at 4°C between 2-7days, 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.

Amino Acid Sequence: SHTLPVRLLR PSDDVQKIVE ELQSLSKMLL KDVEEEKGVL VSQNYTLPCL SPDAQPNNI HSPAIRAYLK TIQQLDNKSV IDEIIEHLDK LIFQDAPETN ISVPTDTHEC KRFILTISQQ FSECMDLALK SLTSGAQQT T.

Purity: Greater than 95.0% as determined by SDS-PAGE.

Endotoxicity: The endotoxin level is less than 1 EU / µg determined by LAL method.

Biological Activity: The ED50 was determined by its ability to activate STAT following receptor ligand interaction and found to be < 5 ng/ml, corresponding to a specific activity of 200,000 units/mg.

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Recombinant Human Interferon gamma induced Protein (rh IP-10 / CXCL10)

**Synonyms:** Small inducible cytokine B10, 10 kDa interferon-gamma-induced protein, Gamma-IP10, chemokine (C-X-C motif) ligand 10, C7, IFI10, INP10, crg-2, mob-1, SCYB10, gIP-10.

**Introduction:** IP-10 is a small cytokine belonging to the CXC chemokine family. IP-10 is secreted by several cell types in response to IFN-γ. These cell types include monocytes, endothelial cells and fibroblasts. IP-10 has been attributed to several roles, such as chemoattraction for monocytes and T cells, promotion of T cell adhesion to endothelial cells, anti tumor activity and inhibition of bone marrow colony formation and angiogenesis. The gene for IP-10 is located on human chromosome 4 in a cluster among several other CXC chemokines. IP-10 elicits its effects by binding to the cell surface chemokine receptor CXCR3. The three-dimensional crystal structure of this chemokine has been determined under 3 different conditions to a resolution of up to 1.92Å.

**Description:** Recombinant human IP-10 produced in *E. Coli* is a single, non-glycosylated polypeptide chain containing 77 amino acids and having a molecular mass of 8.5 kDa. rh IP-10 is purified by proprietary chromatographic techniques.

**Source:** *Escherichia Coli*.

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

**Formulation:** Lyophilized from a 0.22 µm filtered solution in 50 mM sodium phosphate, 50 mM NaCl, pH 7.7. The aliquots/samples of 1µg contain Trehalose 5% (w/vol) for better recovery.

**Solubility:** It is recommended to reconstitute the lyophilized rh IP-10 in sterile H₂O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh IP-10 although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh IP-10 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 95.0% as determined by SDS-PAGE.

**Amino acid sequence:** VPLSRTVRCT CISISNQPVN PRSLEKLEII PASQFCPRVE IIAITMKKKGE KRCLNPESKA IKNLLKAVSK EMSKRSP

**Endotoxicity:** The endotoxin level is less than 1 EU / µg determined by LAL method.

**Biological Activity:** Determined by its ability to chemoattract human T-lymphocytes in a concentration range of 10 – 100 ng/ml the ED₅₀ range is 5.0 - 20 ng/mL.

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www.immunotools.com
Recombinant Human Leukemia Inhibitory Factor (rh LIF)

**Synonyms:** CDF, HILDA, D-FACTOR, Differentiation-stimulating factor, Melanoma-derived LPL inhibitor, MLPLI, Emfilermin, DIA

**Introduction:** Leukemia Inhibitory Factor is a lymphoid factor that promotes long-term maintenance of embryonic stem cells by suppressing spontaneous differentiation. LIF has several functions such as cholinergic neuron differentiation, control of stem cell pluripotency, bone & fat metabolism, mitogenesis of factor dependent cell lines & promotion of megakaryocyte production in vivo. Human and mouse LIF exhibit a 78% identity in its amino acid sequence. Human LIF is as active on human cells as is it on mouse cells, though mouse LIF is about 1000 fold less active on human cells than human LIF.

**Description:** Recombinant human Leukemia Inhibitory Factor produced in E.Coli is a single, non-glycosylated, polypeptide chain containing 180 amino acids and having a molecular mass of 19.7kDa. The human LIF is purified by proprietary chromatographic techniques.

**Source:** Escherichia Coli.

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** lyophilized from a 0.22 µm filtered solution in PBS, pH 7.5. The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery

**Solubility:** It is recommended to reconstitute the lyophilized rh LIF in sterile H₂O not less than 1mg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh LIF although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution rh LIF 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% HSS or BSA). Please prevent freeze-thaw cycles.

**Purity:** Greater than 95.0% as determined by SDS-PAGE silver stained gel.

**Amino acid sequence:** SPLPITPVNA TCAIRHPCHN NLNMQIRSQL AQLNGSANAL FILYYTAQGE PFPNLDKLC GPNVTDFFPF HANGTEKAKL VEYRIVVYL GTSLGNITRD QKLNPSALS LHSKLNATAD ILRGGLSNVL CRLCSKYHVG HVDTVYGPDT SGKDVFQKKK LGCQLLGKYK QIIAVLAQAF

**Biological Activity:** Determined by LIF induced STAT3 activation in murine C2C12 cells the ED50 is < 0.01 ng/ml, corresponding to a specific activity of 100M IU/mg.

**Endotoxicity:** The endotoxin level is less than 1 EU / µg determined by LAL method

**Due to patent rights it is prohibited to use rh LIF for commercial purposes in the USA.**

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Recombinant Human Monocyte Chemotactic Protein-1 (CCL2 / rh MCP-1)

**Synonyms:** Small inducible cytokine A2, Monocyte chemoattractant protein 1, Monocyte chemotactic and activating factor, MCAF, Platelet-derived growth factor-inducible protein JE.

**Introduction:** MCP-1 is a small cytokine belonging to the CC chemokine family that is also known as monocyte chemotactic protein-1 (MCP-1). It is found at the site of tooth eruption and bone degradation. In the bone MCP-1 is expressed by mature osteoclasts and osteoblasts and is under the control of nuclear factor κB (NFκB). MCP-1 recruits immune cells, such as monocytes, to sites of tissue injury and infection. It is produced as a protein precursor containing signal peptide of 23 amino acids and a mature peptide of 76 amino acids. It is a monomeric polypeptide, with a molecular weight of approximately 13kDa. As with many other CC chemokines MCP-1 is located on chromosome 17 in humans. The cell surface receptors that bind MCP-1 are CCR2 and CCR5.

**Description:** Recombinant human MCP-1 produced in *E.Coli* is a non-glycosylated polypeptide chain containing 76 amino acids and having a molecular mass of 8607 Dalton. The rh MCP-1 is purified by proprietary chromatographic techniques.

**Source:** *Escherichia Coli*.

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilized from a 0.22 µm filtered solution in 25 mM sodium phosphate, 400 mM NaCl, pH 7.4. The aliquots/samples of 1µg contain Trehalose 5% (w/vol) for better recovery.

**Solubility:** It is recommended to reconstitute the lyophilized rh MCP-1 in sterile H₂O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh MCP-1 although stable at room temperature for 3 weeks, should be stored desiccated below −18° C. Upon reconstitution rh MCP-1 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 95.0% as determined by SDS-PAGE.

**Amino acid Sequence:** QPDAINAPVT CCYNFTNRKI SVQRLASYRR ITSSKCPKEA VIFKTIVA KE ICADPKQKWV QDSMDHLDKQ TQTPKT

**Endotoxicity:** The endotoxin level is less than 1 EU / µg determined by LAL method.

**Biological Activity:** rh MCP-1 is fully biologically active when compared to standard. The specific activity as determined by the ability of MCP-1 to chemoattract human monocytes using a concentration of 5-20 ng/ml.

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www.immunotools.com
Recombinant Human Monocyte Chemotactic Protein-2 (rh MCP-2 / CCL8)

**Synonyms:** Small inducible cytokine A8, Monocyte chemoattractant protein 2, chemokine (C-C motif) ligand 8, HC14

**Introduction:** The MCP proteins belong to the CC chemokine family and signal through CCR2 and - with the exception of MCP-1 - other CCR receptors. The MCP proteins chemoattract and activate monocytes, activated T cells, basophils, NK cells, and immature dendritic cells. The MCP family cross-reacts across species. The CCL8 is produced as a precursor containing 109 amino acids, which is cleaved to produce mature CCL8 containing 75 amino acids. The gene for CCL8 is encoded by 3 exons and is located within a large cluster of CC chemokines on chromosome 17q11.2 in humans. CCL8 elicits its effects by binding to several different cell surface receptors called chemokine receptors. These receptors include CCR1, CCR2B and CCR5.

**Description:** Human Recombinant Monocyte Chemotactic Protein-2 produced in E.Coli is a non-glycosylated, polypeptide chain containing 76 amino acids (including the four highly conserved cysteine residues present in the CC chemokines) and having a molecular mass of 8.9 kDa.

**Source:** *Escherichia Coli.*

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilized from a 0.22 µm filtered solution in 50 mM Sodiumphosphate, 50 mM NaCl, pH 7.8. The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery.

**Solubility:** It is recommended to reconstitute the lyophilized MCP-2 in sterile H2O not less than 100µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized MCP-2 although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution CCL8 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 95.0% as determined by SDS-PAGE / silver stain

**Endotoxicity:** The endotoxin level is less than 1 EU/µg determined by LAL method.

**Amino acid sequence:** QPDVSIPIT CCFNVIRKI PIQRLESYTR ITNIOQPKVEA VIFKTKRGKE VCADPKERWV RDSMKHLDQI FQNLKP

**Biological Activity:** Determined by its ability to induce chemotaxis of human PBMCs within a concentration range of 10 - 100 ng/ml.

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Recombinant Human Monocyte Chemotactic Protein-3 (rh MCP-3 / CCL7)

**Synonyms:** Small inducible cytokine A7, Monocyte chemoattractant protein 3, chemokine (C-C motif) ligand 7, MARC

**Introduction:** The MCP proteins belong to the CC chemokine family and signal through CCR2 and - with the exception of MCP-1 - other CCR receptors. The MCP proteins chemoattract and activate monocytes, activated T cells, basophils, NK cells, and immature dendritic cells. The MCP family cross-reacts across species. CCL7 specifically attracts monocytes and regulates macrophage function. It is produced by certain tumor cell lines and by macrophages. This chemokine is located on chromosome 17 in humans, in a large cluster containing many other CC chemokines and is most closely related to CCL2 (previously called MCP-1).

**Description:** Human Recombinant Monocyte Chemotactic Protein-3 produced in E.Coli is a non-glycosylated, polypeptide chain containing 76 amino acids (including the four highly conserved cysteine residues present in the CC chemokines) and having a molecular mass of 9 kDa.

**Source:** *Escherichia Coli.*

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilized from a 0.22 µm filtered solution in 50 mM Sodiumphosphate, 50 mM NaCl, pH 7.8. The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery.

**Solubility:** It is recommended to reconstitute the lyophilized MCP-3 in sterile H2O not less than 100µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized MCP-3 although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution CCL7 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 95.0% as determined by SDS-PAGE / silver stain

**Endotoxicity:** The endotoxin level is less than 1 EU/µg determined by LAL method

**Amino acid sequence:** QPVGINTSTT CCYRFINKKI PKQRLESYRR TTSSHCPREA VIFKTKLDKE ICADPTQKWV QDFMKHLDKK TQTPKL

**Biological Activity:** Determined by its ability to induce chemotaxis of human PBMCs within a concentration range of 10 - 100 ng/ml.

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Recombinant Human Macrophage Colony Stimulating Factor (rh M-CSF)

Introduction: Granulocyte/ Macrophage Colony- Stimulating Factors are cytokines that act in hematopoiesis by controlling the production, differentiation and function of 2 related white cell populations of the blood, the granulocytes and the monocytes- macrophages. M-CSF induces cells of the monocyte/ macrophage lineage. It plays a role in immunological defenses, bone metabolism, lipoproteins clearance, fertility and pregnancy.

Description: Recombinant human M-CSF produced in *E. coli* is a disulfide linked homodimer, non-glycosylated, polypeptide chain containing 2 x 159 amino acids and having a total molecular mass of 36.8 kDa. rh M-CSF is purified by proprietary chromatographic techniques.

Source: *Escherichia Coli*.

Physical Appearance: Sterile filtered white lyophilized (freeze-dried) powder.

Formulation: lyophilized from a 0.22 filtered carrier free solution in 50 mM Tris and 200 mM NaCl, pH 10.0. The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery.

Solubility: It is recommended to reconstitute the lyophilized rh M-CSF in sterile H₂O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

Stability: Lyophilized rh M-CSF although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh M-CSF should be stored at 4° C between 2-7 days and for future use below -18° C. Please prevent freeze-thaw cycles.

Purity: 95.0% as determined by SDS-PAGE / silver stain.

Endotoxicity: The endotoxin level is less than 1 EU/µg determined by LAL method

Amino Acid Sequence: MEEVSEYCSH MIGSGHLQSL QRLIDSQMET SCQITFEFVD QEQLKDPVCY LKKAFLLVQD IMEDTMRFRD NTPNAIAIVQ LQELSLRLKS CFTKDYEEHD KACVRTFYET LQLLEKVKN VFNETKNLDD KDWNIFSNC NNSFAECSSQ GHERQSEGS.

Biological Activity: The ED₅₀ tested by receptor driven reporter gene expression in Ba/F3 c-fms transfectants was found to be < 2.0 ng/ml.

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Recombinant Human Macrophage Inflammatory Protein-1 alpha (rh MIP-1alpha / CCL3)

**Synonyms:** Small inducible cytokine A3, SCYA3, Tonsillar lymphocyte LD78 alpha protein, LD78ALPHA.

**Introduction:** Macrophage Inflammatory Proteins (MIP) belong to the family of chemotactic cytokines known as chemokines. In humans there are two major forms. Both are major factors produced by macrophages after they are stimulated with bacterial endotoxins. They activate human granulocytes (neutrophils, eosinophils, and basophils) which can lead to acute neutrophilic inflammation. They also induce the synthesis and release of other pro-inflammatory cytokines such as Interleukin 1 (IL-1), IL-6 and TNF-α from fibroblasts and macrophages. The genes for MIP-1alpha and MIP-1beta are both located on human chromosome 17.

**Description:** Recombinant human MIP-1alpha produced in *E.Coli* is a single, non-glycosylated, polypeptide chain containing 70 amino acids and having a molecular mass of 7820 Dalton. rh MIP-1alpha is purified by proprietary chromatographic techniques.

**Source:** *Escherichia Coli*.

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilized from 0.22 µm filtered solution in 25 mM Sodiumphosphate
The aliquots/samples of 1µg contain Trehalose 5% (w/vol) for better recovery

**Solubility:** It is recommended to reconstitute the lyophilized rh MIP-1 alpha in sterile H$_2$O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh MIP-1alpha, although stable at room temperature for 3 weeks, should be stored desiccated below –18° C. Upon reconstitution rh MIP-1alpha 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 95.0% as determined by SDS-PAGE.

**Amino acid Sequence:** ASLAAADTPTA CCFSYTSRQI PQNFIADYFE TSSQCSKPGV IFLTKRSRQV CADPSEEWVQ KYVSDELSA

**Biological Activity:** The activity is calculated by the ability of chemo-attraction of human monocytes using a range of 1-10 ng/ml.

**Endotoxicity:** The endotoxin level is less than 1 EU / µg determined by LAL method

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Recombinant Human Platelet-derived Growth Factor AA (rh PDGF-AA)

**Synonyms:** Glioma-derived growth factor (GDGF), Osteosarcoma-derived Growth Factor (ODGF), PDGF-1.

**Introduction:** PDGFs are disulfide-linked dimers consisting of two 12.0-13.5 kDa polypeptide chains, designated PDGF-A and PDGF-B chains. The three naturally occurring PDGFs; PDGF-AA, PDGF-BB and PDGF-AB, are potent mitogens for a variety of cell types including smooth muscle cells, connective tissue cells, bone and cartilage cells, and some blood cells. The PDGFs are stored in platelet alpha-granules and are released upon platelet activation. The PDGFs are involved in a number of biological processes, including hyperplasia, chemotaxis, embryonic neuron development, and respiratory tubule epithelial cell development. Two distinct signaling receptors used by PDGFs have been identified and named PDGFR-alpha and PDGFR-beta. PDGFR-alpha is high-affinity receptor for each of the three PDGF forms. On the other hand, PDGFR-beta interacts with only PDGF-BB and PDGF-AB.

**Description:** Recombinant human PDGF-AA is a non-glycosylated, disulfide-linked homodimer of two A-chains (2 x 125 amino acids) having a molecular mass of 28.5 kDa.

**Source:** *Escherichia Coli*

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilized from a 0.22 µm filtered solution in 100mM acetic acid. The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery

**Solubility:** It is recommended to reconstitute the lyophilized rh PDGF-AA in sterile H₂O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh PDGF-AA although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh PDGF-AA 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 95.0% as determined by SDS-PAGE.

**Amino acid sequences:**

```
SIEEAVPAVC  KTRTVIYEIP  RSQVDPTSAN  FLIWWPCVEV  KRCTGCCNTS
SVKCQPSRVH  HRSVKVAKYE  YVRKKPKLKE VQVRLEEHLE  CACATTSLNPDYREEDTGRPYRESGKKRRKRKLKPT
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**Endotoxicity:** The endotoxin level is less than 1 EU / µg determined by LAL method.

**Biological Activity:** Determined by the dose-dependent stimulation of thymidine uptake by BALB/c 3T3 cells the ED50 is < 1 ng/ml, corresponding to a specific activity of > 1 x 10⁶ units/mg.

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Recombinant Human Platelet-derived Growth Factor BB (rh PDGF-BB)

**Synonyms:** Small inducible cytokine A3, SCYA3, Tonsillar lymphocyte LD78 alpha protein, LD78ALPHA.

**Introduction:** Macrophage Inflammatory Proteins (MIP) belong to the family of chemotactic cytokines known as chemokines. In humans there are two major forms. Both are major factors produced by macrophages after they are stimulated with bacterial endotoxins. They activate human granulocytes (neutrophils, eosinophils and basophils) which can lead to acute neutrophilic inflammation. They also induce the synthesis and release of other pro-inflammatory cytokines such as Interleukin 1 (IL-1), IL-6 and TNF-α from fibroblasts and macrophages. The genes for MIP-1alpha and MIP-1beta are both located on human chromosome 17.

**Description:** Recombinant human MIP-1alpha produced in *E.Coli* is a single, non-glycosylated, polypeptide chain containing 70 amino acids and having a molecular mass of 7820 Dalton. rh MIP-1alpha is purified by proprietary chromatographic techniques.

**Source:** *Escherichia Coli*.

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilized from 0.22 µm filtered solution in 25 mM Sodiumphosphate. The aliquots/samples of 1µg contain Trehalose 5% (w/vol) for better recovery.

**Solubility:** It is recommended to reconstitute the lyophilized rh MIP-1 alpha in sterile H₂O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh MIP-1alpha, although stable at room temperature for 3 weeks, should be stored desiccated below −18° C. Upon reconstitution rh MIP-1alpha 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 95.0% as determined by SDS-PAGE.

**Amino acid Sequence:** ASLAADTPTA CCFSYTSRQI PQNFIADYFE TSSQCSKPGV IFLTKRSRQV CADPSEEWVQ KYVSDELSA

**Biological Activity:** The activity is calculated by the ability of chemo-attraction of human monocytes using a range of 1-10 ng/ml.

**Endotoxicity:** The endotoxin level is less than 1 EU / µg determined by LAL method

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Recombinant Human Rantes (rh Rantes / CCL5)

Synonyms: Regulation upon Activation Normal T cell Express Sequence, SIS-delta

Introduction: RANTES is a CC-chemokine that can signal through the CCR1, CCR3, CCR5 and US28 (cytomegalovirus receptor) receptors. It is chemotactic for T cells, eosinophils and basophils and plays an active role in recruiting leukocytes into inflammatory sites. With the help of particular cytokines (i.e. IL-2 and IFN-γ) that are released by T cells Rantes also induces the proliferation and activation of certain natural killer (NK) cells to form CHAK (CC-Chemokine-activated killer) cells. It is also a HIV-suppressive factor released from CD8+ T cells. This chemokine has been localized to chromosome 17 in humans.

Description: Recombinant human Rantes produced in E.Coli is a single, non-glycosylated polypeptide chain containing 68 amino acids and having a molecular mass of 7.8 kDa. The rh Rantes is purified by proprietary chromatographic techniques.

Source: Escherichia Coli

Physical Appearance: Sterile filtered white lyophilized (freeze-dried) powder.

Formulation: Lyophilized from a 0.22 µm filtered solution in 25 mM NaP, 250 mM NaCl, pH 7.5

The aliquots/samples of 1µg contain Trehalose 5% (w/vol) for better recovery

Solubility: It is recommended to reconstitute the lyophilized rh Rantes in sterile H2O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

Stability: Lyophilized rh Rantes although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh Rantes 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 95.0% as determined by SDS-PAGE / silver stain.

Endotoxicity: The endotoxin level is less than 1 EU / µg determined by LAL method

Amino acid Sequence: SPYSSDTTPC CFAYIARPLP RAHIKEYFYT SGKCSNPADV FVTRKNRQVC ANPEKKWVRE YINSLEMS

Biological Activity: Biological activity was determined by its ability to chemoattract human blood monocytes at a concentration between 1 – 10 ng/ml

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Recombinant Human sCD40 Ligand/TRAP (rh sCD40L / CD154)

**Synonyms:** solubile CD40-L, Tumor necrosis factor ligand superfamily member 5 (TNFSF5), TNF-related activation protein (TRAP), T cell antigen Gp39

**Introduction:** rh sCD40L is a membrane glycoprotein and differentiation antigen expressed on the surface of T-cells. The sCD40L stimulates B-cell proliferation and secretion of all immunoglobulin isotypes in the presence of cytokines. The sCD40L has been shown to induce cytokine production and tumoricidal activity in peripheral blood monocytes. It also costimulates proliferation of activated T-cells and this is accompanied by the production of IFN-gamma, TNF-alpha and IL2.

**Description:** rh sCD40L/TRAP produced in *E. Coli* is a non-glycosylated, polypeptide chain containing 149 amino acids and having a molecular mass of 16308 Dalton. The sCD40L/TRAP is purified by proprietary chromatographic techniques.

**Source:** *Escherichia Coli*.

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** 0.22 µm filtered solution in 25 mM sodium phosphate, 100 mM NaCl, pH 7.7,

**Solubility:** It is recommended to reconstitute the lyophilized rh sCD40L/TRAP in sterile water not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh sCD40L/TRAP although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Reconstituted rh sCD40L/TRAP 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 RP-HPLC and by SDS-PAGE.

**Amino Acid Sequence:** MQKGDQNPOI AAHVISEASS KTTYTMSNNL VTLENKQLT VKRQGLYYIY AQVTFTCSNRE ASSQAPFIAS LWLKSPGRFE RILRRAANTH SSACKPCGQS IHLLGVFELQ PGASVFVNVT DPSQVSHGFT FTSGLLKL

**Endotoxicity:** The endotoxin level is less than 1 EU / µg determined by LAL method.

**Biological Activity:** The ED₅₀ as determined by the dose-dependant stimulation of IL-12 & IL-8 induction by PMB (peripheral mononuclear cells) was found to be 10 - 100 ng/ml.

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Recombinant Human Stem Cell Factor (rh SCF)

**Synonyms:** Kit ligand Precursor, KL-1, C-kit ligand, Mast cell growth factor, MGF, Steel Factor, SF

**Introduction:** Stem cell factor is a cytokine which binds CD117(c-Kit). SCF exists in two forms, cell surface bound SCF and soluble (or free) SCF. Soluble SCF is produced by the cleavage of surface bound SCF by metalloproteases. SCF is a growth factor important for the survival, proliferation, and differentiation of hematopoietic stem cells and other hematopoietic progenitor cells. One of its roles is to change the BFU-E (burst-forming unit-erythroid) cells which are the earliest erythrocyte precursors in the erythrocytic series into the CFU-E (colony-forming unit-erythroid). In vitro and in vivo SCF can stimulate the proliferation of mature, as well as the proliferation and maturation of immature, mast cells. On purified primitive human and mouse hematopoietic precursors, SCF acts in a synergistic manner with various growth factors, such as IL-1, IL-3, IL-6, IL-7 and Epo, to induce myeloid, erythroid and lymphoid lineage colony formation.

Murine or rat soluble SCF is highly homologous to human soluble SCF (approximately 80%). Whereas both rat and mouse SCF are active on human cells, the human protein is much less active on mouse or rat cells.

**Description:** Recombinant human SCF produced in *E.Coli* is a single, non-glycosylated polypeptide chain containing 165 amino acids and having a molecular mass of 18.4 kDa. The rh SCF is purified by proprietary chromatographic techniques.

**Source:** *Escherichia Coli*.

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilized from a 0.22µm filtered solution in water containing 10 mM acetic acid. The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery.

**Solubility:** It is recommended to reconstitute the lyophilized rh SCF in sterile H2O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh SCF although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh SCF 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 95.0% as determined by SDS-PAGE.

**Amino Acid Sequence:**

```
MEGICRNRVT NNVKDVTKLV ANLPKDYMIT LKYVPGMVDVL PSCHWISEMV VQLSDSLTDL LDKFSNISEG LSNSIIKDL VNIVDDLLVEC VKENSSDKLK KSFKSPEPRL FTPEEFFRIF NRSIDAFKDF VVASETSDCV VSSTLSPEKD SRVSVTKPFM LPPVA
```

**Endotoxicity:** The endotoxin level is less than 1 EU / µg determined by LAL method.

**Biological Activity:** The ED_{50} as determined by the dose-dependant stimulation of human TF-1 cells is < 2 ng/ml, corresponding to a specific activity of 5 x 10^3 IU/mg.

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Recombinant Human Stromal Cell-Derived Factor-1 alpha (rh SDF-1alpha / rh CXCL12α)

**Synonyms:** Pre-B cell growth-stimulating factor (PBSF), chemokine (C-X-C motif) ligand 12, SCYB12, TLSF-a.

**Introduction:** SDF-1 produced in two forms, SDF-1α/CXCL12α and SDF-1β/CXCL12b, by alternate splicing of the same gene. The SDF-1 proteins belong to the group of CXC chemokines, whose initial pair of cysteines are separated by one intervening amino acid. SDF-1alpha is strongly chemotactic for lymphocytes and has been implicated as an important cell co-ordinator during development. During embryogenesis it directs the migration of hematopoietic cells from foetal liver to bone marrow. Mice which were knocked-out for SDF-1 gene were lethal before the birth or within just 1 hour of life. As another role, SDF-1alpha alters also the electrophysiology of neurons. SDF-1 was shown to be expressed in many tissues in mice (including brain, thymus, heart, lung, liver, kidney, spleen and bone marrow). The receptor for this chemokine is CXCR4. This SDF-1-CXCR4 interaction used to be considered exclusive (unlike for other chemokines and their receptors), but recently it was suggested that SDF-1 is also bound by CXCR7 receptor. In human and mouse both SDF-1 and CXCR4 show high identity of sequence: 99% and 90%, respectively.

**Description:** Recombinant human SDF-1 alpha produced in *E.Coli* is a non-glycosylated, polypeptide chain containing 68 amino acids and having a molecular mass of 8008 Dalton. The rh SDF-1 alpha is purified by proprietary chromatographic techniques.

**Source:** *Escherichia Coli.*

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilized from a 0.22 μm filtered solution in 50 mM Sodiumphosphate, 50 mM NaCl, pH 7.8. The aliquots of 1μg and 2μg contain Trehalose 5% (w/vol) for better recovery.

**Solubility:** It is recommended to reconstitute the lyophilized rh SDF-1alpha in sterile H₂O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh SDF-1 alpha although stable at room temperature for 3 weeks, should be stored desiccated 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:** 95.0% as determined by SDS-PAGE.

**Amino acid Sequence:** KPVSLSYRCP CRFFESHVAR ANVKHLKILN TPNCALQIVA RLKNNNRQVC IDPKLKWIQE YLEKALNK

**Endotoxicity:** The endotoxin level is less than 1 EU / µg determined by LAL method.

**Biological Activity:** The specific activity as determined by its ability to chemoattract human peripheral T cells activated with PHA and IL-2 using a concentration of 20 - 80 ng/ml.

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Recombinant Human Stromal Cell-Derived Factor-1 beta  
(rh SDF-1 beta / rh CXCL12β)

**Synonyms:** Pre-B cell growth-stimulating factor, PBSF, hIRH, TPAR1, SCYB12, TLSF-b.

**Introduction:** SDF-1 is produced in two forms, SDF-1α/CXCL12a and SDF-1β/CXCL12b, by alternate splicing of the same gene. The SDF-1 proteins belong to the group of CXC chemokines whose initial pair of cysteines are separated by one intervening amino acid. SDF-1 is strongly chemotactic for lymphocytes and has been implicated as an important cell co-ordinator during development. During embryogenesis it directs the migration of hematopoietic cells from foetal liver to bone marrow. Mice which were knocked-out for SDF-1 gene were lethal before the birth or within just 1 hour of life. As another role, SDF-1 alters also the electrophysiology of neurons. SDF-1 was shown to be expressed in many tissues in mice (including brain, thymus, heart, lung, liver, kidney, spleen and bone marrow). The receptor for this chemokine is CXCR4, which was previously called fusin. This SDF-1-CXCR4 interaction used to be considered exclusive (unlike for other chemokines and their receptors), but recently it was suggested that SDF-1 is also bound by CXCR7 receptor. The gene for SDF-1 is located on human chromosome 10. In human and mouse both SDF-1 and CXCR4 show high identity of sequence: 99% and 90%, respectively.

**Description:** Recombinant human SDF-1 beta produced in E.Coli is a non-glycosylated, polypeptide chain containing 72 amino acids and having a molecular mass of 8.5 kDa. The SDF-1b is purified by proprietary chromatographic techniques.

**Source:** Escherichia Coli.

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilized from a concentrated solution in water containing no additives. The aliquots of 1µg and 2µg contain Trehalose 5% (w/vol) for better recovery

**Solubility:** It is recommended to reconstitute the lyophilized rh SDF-1beta in sterile H₂O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized rh SDF-1 beta although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution rh SDF-1 beta 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 RP-HPLC and by SDS-PAGE.

**Amino acid Sequence:** The sequence of the first five N-terminal amino acids was determined and was found to be Lys-Pro-Val-Ser-Leu.

**Endotoxicity:** The endotoxin level is less than 1 EU / µg determined by LAL method.

**Biological Activity:** The specific activity as determined by its ability to chemoattract human peripheral T cells activated with PHA and IL-2 using a concentration of 20 - 80 ng/ml.

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www.immunotools.com
Recombinant Human Tumor Necrosis Factor-alpha (rh TNF-alpha)

Synonyms: Tumor necrosis factor ligand superfamily member 2, Cachectin, DIF, TNFSF2, Necrosin, Cytotoxin.

Introduction: Tumor necrosis factor is a cytokine involved in systemic inflammation and is a member of a group of cytokines that all stimulate the acute phase reaction. TNFalpha is mainly secreted by macrophages. TNFalpha causes apoptotic cell death, cellular proliferation, differentiation, inflammation, tumorigenesis and viral replication and is also involved in lipid metabolism and coagulation. TNF's primary role is in the regulation of immune cells. Dysregulation and in particular overproduction of TNFalpha have been implicated in a variety of human diseases- autoimmune diseases, insulin resistance and cancer.

Description: Recombinant human TNF-alpha produced in *Escherichia Coli* is a single, non-glycosylated polypeptide chain containing 158 amino acids and having a molecular mass of 17483.77 Dalton. The rh TNF-alpha is purified by standard chromatographic techniques.

Source: *Escherichia Coli*

Physical Appearance: Sterile filtered white lyophilized (freeze-dried) powder.

Formulation: Lyophilised from a 0.2 µm filtered solution in 25mM sodium acetate pH 6.5 containing 200mM NACl. The aliquots of 1µg contain Trehalose 5% (w/vol) for better recovery.

Solubility: It is recommended to reconstitute the lyophilized rh TNF-alpha in sterile H_2O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

Stability: Lyophilized rh TNF-alpha although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh TNF-alpha 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 95.0% as determined by SDS-PAGE.

Amino Acid Sequence: The sequence of the first five N-terminal amino acids was determined and was found to be Met-Val-Arg-Ser-Ser.

Biological Activity: The ED_{50} as determined by the cytolysis of murine L929 cells in the presence of Actinomycin D is < 0.05 ng/ml, corresponding to a specific activity of 2 x 10^{7} IU/mg.

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Recombinant Human Thymic Stromal Lymphopoietin (rh TSLP)

**Synonyms:** none

**Introduction:** TSLP protein is a hemopoietic cytokine which signals throughout a heterodimeric receptor complex composed of the thymic stromal lymphopoietin receptor & the Interleukin-7 receptor alpha chain. TSLP impacts myeloid cells thus induces the discharge of T cell-attracting chemokines from monocytes & increases the growth of CD11c(+) dendritic cells. TSLP is mainly expressed in the heart, liver and prostate. TSLP is related in its biological activities with IL-7 and binds with the heterodimeric receptor complex consisting of the Interleukin-7 receptor alpha chain & the TSLPR. Similar to IL-7, TSLP enhances phosphorylation of STAT3 and STAT5, though uses kinases excluding JAKs for its activation. TSLP induces the release of T cell-attracting chemokines such as TARC & MDC from monocytes & triggers CD11c(+) dendritic cells. TSLP activated dendritic cells primes naive T cells to manufacture pro-allergic cytokines such as Interleukin-4, Interleukin-5, Interleukin-13 and TNF-alpha whereas down-regulating Interleukin-10 and IFN-gamma play a role in the initiation of allergic inflammation.

**Description:** Recombinant human Thymic Stromal Lymphopoietin produced in E.Coli is a single, non-glycosylated polypeptide chain containing 132 amino acids and having a molecular mass of 15 kDa.

**Source:** Escherichia Coli.

**Physical Appearance:** Sterile filtered white lyophilized (freeze-dried) powder.

**Formulation:** Lyophilized from a 0.22µm filtered solution in phosphate buffered saline, pH 7.2.

**Reconstitution:** It is recommended to reconstitute the lyophilized TSLP in sterile H₂O not less than 100µg/ml, which can then be further diluted to other aqueous solutions.

**Stability:** Lyophilized TSLP although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution TSLP 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:** 95.0% as determined by SDS-PAGE / silver stain.

**Endotoxicity:** The endotoxin level is less than 1 EU/µg determined by LAL method.

**Amino acid sequence:** MYDFTNCDFE KIKAAYLSTI SKDLITYMSG TKSTEFNNTV SCSNRPHCLT EQSLTFNPT AGCASLAKEM FAMKTKAALA IWCPGYSETQ INATQAMKKR RKRKVTTNKC LEQVSQLQGL WRRFRNPLLK QQ

**Biological Activity:** By testing its ability to induce STAT activation in Ba/F3 h TSLPR transfectants the ED_{50} is found to be < 0.3 ng/ml.

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Recombinant Human Vascular Endothelial Growth Factor (rh VEGF)

Synonyms: VEGF-165, Vascular permeability factor (VPF)

Introduction: Vascular endothelial growth factor is an important signaling protein involved in both vasculogenesis and angiogenesis. As its name implies, VEGF activity has been mostly studied on cells of vascular endothelium, although it does have effects on a number of other cell types (e.g., stimulation of monocyte/macrophage migration, neurons, cancer cells, kidney epithelial cells). VEGF mediates increased vascular permeability, induces angiogenesis, vasculogenesis and endothelial cell mitogenesis and cell migration. VEGF is also a vasodilator and increases microvascular permeability and was originally referred to as vascular permeability factor. Elevated levels of this protein are linked to POEMS syndrome, also known as Crow-Fukase syndrome. Mutations in this gene have been associated with proliferative and nonproliferative diabetic retinopathy.

Description: Recombinant human VEGF-A produced in E.Coli is a double, non-glycosylated, polypeptide chain containing 165 amino acids and having a molecular mass of 38.2 kDa. The rh VEGF-A is purified by proprietary chromatographic techniques.

Source: Escherichia Coli

Physical Appearance: Sterile filtered white lyophilized (freeze-dried) powder.

Formulation: Lyophilized from a concentrated (1 mg/ml) solution containing 50 mM acetic acid. The aliquots of 1 µg and 2 µg contain Trehalose 5% (w/vol) for better recovery.

Solubility: It is recommended to reconstitute the lyophilized rh VEGF-A in sterile water or aqueous buffers not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

Stability: Lyophilized rh VEGF-A although stable at room temperature for 3 weeks, should be stored desiccated below -18° C. Upon reconstitution rh VEGF-A 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 95.0% as determined by SDS-PAGE.

Endotoxicity: The endotoxin level is less than 1 EU/µg determined by LAL method.

Biological Activity: The ED_{50} for stimulation of ^3H-thymidine incorporation and cell proliferation by human umbilical vein endothelial cells for VEGF-A has been determined to be in the range of 1-2 ng/ml.

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</tr>
</tbody>
</table>