PF-4/CXCL4 Protein, Human (HEK293, His)

Cat. No.:	HY-P70618
Synonyms:	Platelet Factor 4; PF-4; C-X-C Motif Chemokine 4; Iroplact; Oncostatin-A; PF4; CXCL4; SCYB4
Species:	Human
Source:	HEK293
Accession:	P02776 (E32-S101)
Gene ID:	5196
Molecular Weight:	10-14 kDa

PROPERTIES

AA Sequence	E A E E D G D L Q C L C V K T T S Q V R P R H I T S L E V I K A G P H C P T A Q L I A T L K N G R K I C L D L Q A P L Y K K I I K K L L E S
Appearance	Lyophilized powder
Formulation	Lyophilized from a 0.2 μm filtered solution of 20 mM PB, 150 mM NaCl, 5% Trehalose, 5% Mannitol, 1 mM EDTA, 0.02% Tween 80, pH 6.0.
Endotoxin Level	<1 EU/μg, determined by LAL method.
Reconsititution	It is not recommended to reconstitute to a concentration less than 100 μg/mL in ddH_2O.
Storage & Stability	Stored at -20°C for 2 years. After reconstitution, it is stable at 4°C for 1 week or -20°C for longer (with carrier protein). It is recommended to freeze aliquots at -20°C or -80°C for extended storage.
Shipping	Room temperature in continental US; may vary elsewhere.

DESCRIPTION

Background	CXCL4, also known as PF-4 (platelet factor-4), is a member of the CXC chemokine family produced by cells of the megakaryocytic lineage. In megakaryocytes CXCL4 is synthesized, enclosed in vesicles, and transferred to the α granules from which it is secreted following platelet activation. CXCL4 expression is also found in microglia, monocytes and activated T-cells[1][2]. Mature human CXCL4 shares 70% amino acid sequence identity with mouse and rat CXCL4. CXCL4 is stored in secretory granules of blood platelets and is released in response to protein kinase C and Rac1 activation. Platelets are considered to be the major cellular source of CXCL4. In the α-granules of blood platelets CXCL4 is kept as a tetramer bound to two molecules of chondroitin sulphate. CXCL4 does not possess an ELR acid sequence at its amino terminus and therefore does not bind to CXCR1 or CXCR2. CXCL4 moderates the effects of heparin-like molecules on the endothelial cell surface of blood vessels, thereby inhibiting local antithrombin III activity, which results in a procoagulant

role of CXCL4. CXCL4 exhibits antiangiogenic properties in vitro and in vivo and inhibits tumor neovascularization through a variety of mechanisms. First, CXCL4 is able to interact directly with angiogenic growth factors, such as FGFs and VEGF, and inhibits their interaction with the cell surface receptor. Second, CXCL4 may bind proteoglycans and interfere with the proteoglycan-bystander effect on growth factor activity. Furthermore, a cell surface receptor that is expressed by human endothelial cells (ECs) in a cell cycle-dependent manner11 and mediates the antiangiogenic effects of CXCL4 has been recently identified and named as CXCR3-B. CXCL4 has been shown to modulate the proliferation, phenotype and function of immune cells. For instance, CXCL4 has been reported to promote monocyte survival and macrophage activation. CXCL4 induces migration of activated T lymphocytes[1][2][3].

CXCL4 shows pleiotropic biological functions. Firstly, CXCL4 activates platelets, modulates platelet aggregation and stimulates release of α-granule proteins. CXCL4 has a role in heparin-induced thrombocytopenia (HIT). Secondly, CXCL4 inhibits endothelial cell proliferation and migration, leading to suppression of angiogenesis. Thirdly, CXCL4 expresses immunomodulatory activities, such as down-regulation of IFN- production by type 1 T-helper (Th1) cells and up-regulation of IL-4, IL-5, and IL-13 in type 2 T-helper (Th2) cells. Fourthly, CXCL4 influences hematopoiesis, inhibiting megakaryocytopoiesis and the proliferation of committed erythroid and granulocyte-macrophage colonies, as well as of primitive $CD34^+$ progenitors. Moreover, CXCL4 is also highly upregulated in plasmacytoid dendritic cells (pDCs) in systemic sclerosis and dendritic cells (DCs) after severe trauma[1][2][3].

REFERENCES

[1]. Lasagni L, et al. PF-4/CXCL4 and CXCL4L1 exhibit distinct subcellular localization and a differentially regulated mechanism of secretion. Blood. 2007 May 15;109(10):4127-34.

[2]. Pieter Ruytinx, et al. CXCL4 and CXCL4L1 in cancer. Cytokine. 2018 Sep;109:65-71.

[3]. Gabriele Domschke, et al. CXCL4-induced macrophages in human atherosclerosis. Cytokine. 2019 Oct;122:154141.

[4]. Alsya J Affandi, et al. CXCL4 is a novel inducer of human Th17 cells and correlates with IL-17 and IL-22 in psoriatic arthritis. Eur J Immunol. 2018 Mar;48(3):522-531.

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