

SDF-1 Protein, Canine

Cat. No.:	HY-P74569
Synonyms:	Stromal Cell-Derived Factor 1; SDF-1; IRH; hIRH; PBSF; CXCL12; SDF1
Species:	Canine
Source:	E. coli
Accession:	Q3LSL4 (K22-M93)
Gene ID:	449622
Molecular Weight:	Approximately 8.6 kDa

PROPERTIES

Appearance	Solution
Formulation	Supplied as a 0.2 µm filtered solution of 50 mM Tris, 500 mM NaCl, pH 8.0.
Endotoxin Level	<1 EU/µg, determined by LAL method.
Reconstitution	N/A.
Storage & Stability	Stored at -80°C for 1 year. It is stable at -20°C for 3 months after opening. It is recommended to freeze aliquots at -80°C for extended storage. Avoid repeated freeze-thaw cycles.
Shipping	Shipping with dry ice

DESCRIPTION

Background

CXCL12 (SDF-1), is a small protein that belongs to the chemokine family, whose members have a crucial role in directing cell migration. It is ubiquitously expressed in many tissues and cell types. CXCL12 acts through two receptors, CXCR4 and CXCR7. While the former is a classic G protein-coupled transmembrane chemokine receptor, the latter primarily function as a scavenger of CXCL12. CXCL12 is a chemoattractant for T-lymphocytes and monocytes, but not neutrophils^{[1][2][3]}. CXCL12 gene in human is located on chromosome 10 (10q11.21) and recognizes seven isoforms deriving from alternative gene splicing (α, β, γ, δ, ε, θ) with α and β being the most studied and three (CXCL12α to γ) in mice. CXCL12 is described classically as a homing chemokine as it exhibits chemoattraction of tumoral cells toward the target tissues. CXCL12, although being homeostatic in classification, also takes inflammatory activities. CXCL12 binds to glycosaminoglycans (GAGs) exposed on the surface of endothelial cells through a cluster of basic residues-the BBXB motif (B for basic amino acid and X any amino acid) generating its chemotactic gradients and promoting leukocyte/cancer cell migration. CXCL12/CXCR4 axis is involved in tumor progression, angiogenesis, metastasis, and survival. CXCR7 binds with high-affinity CXCL12 and with lower-affinity CXCL11. Although CXCR7 acts as a CXCL12 scavenger through ligand internalization and degradation, it transduces the signal mainly through β-arrestin with a pivotal role in endothelial and neural cells. CXCL12 is constitutively expressed in several organs including lung, liver, skeletal muscle, brain, kidney, heart, skin, and bone marrow. CXCL12 secretion is also associated with tissue damage such as heart infarct, limb ischemia, toxic liver damage, excessive bleeding, total body irradiation, and after tissue damage related to chemotherapy. CXCR4 is expressed by endothelial cells and

pericytes of hypoxic, injured, or pathological tissues, including injured carotid arteries and atherosclerotic plaques^{[1][2]}. CXCL12 has been considered as a standard pro-inflammatory molecule for a long time, as it attracts leukocytes to inflammatory sites and contributes to their activation. CXCL12 is very important for vascularization, hematopoiesis and neuronal development, but also for HIV-infection and cancer metastasis. CXCL12 plays a classic chemokine role in immune response by attracting activated, CXCR4+ T cells and monocytes to the sites of inflammation. However, CXCL12 plays an anti-inflammatory role in neuroinflammatory demyelinating disorders of the CNS, i.e. in multiple sclerosis (MS) and its animal model experimental autoimmune encephalomyelitis (EAE). In addition, CXCL12 targeting affects tumor primary growth, mesenchymal transition, and migration but also shapes the tumor microenvironment (TME) toward immunoresponsive TME^{[1][2][3]}.

REFERENCES

[1]. Beverly A Teicher, et al. CXCL12 (SDF-1)/CXCR4 pathway in cancer. *Clin Cancer Res.* 2010 Jun 1;16(11):2927-31.

[2]. Luigi Portella, et al. CXCL12 Signaling in the Tumor Microenvironment. *Adv Exp Med Biol.* 2021;1302:51-70.

[3]. Gordana Timotijević, et al. CXCL12: role in neuroinflammation. *Int J Biochem Cell Biol.* 2012 Jun;44(6):838-41.

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