Animal-Free SDF-1 alpha/CXCL12 Protein, Mouse (His)

Cat. No.:	HY-P700219AF
Synonyms:	CXCL12; Stromal cell-derived factor 1; SDF-1; 12-O-tetradecanoylphorbol 13-acetate repressed protein 1; TPAR1; C-X-C motif chemokine 12; Pre-B cell growth-stimulating factor; PBSF; Thymic lymphoma cell-stimulating factor; TLSF; Sdf1
Species:	Mouse
Source:	E. coli
Accession:	P40224 (G21-K89)
Gene ID:	20315
Molecular Weight:	Approximately 8.97 kDa

PROPERTIES

AA Sequence	M G K P V S L S Y R C P C R F F E S H I A R A N V K H L K I L N T P N C A L Q I V A R L K N N N R Q V C I D P K L K W I Q E Y L E K A L N K
Biological Activity	Measure by its ability to chemoattract BaF3 cells transfected with human CXCR4. The ED_{50} for this effect is <0.5 ng/mL.
Appearance	Lyophilized powder.
Formulation	Lyophilized from a solution containing 1X PBS, pH 7.4.
Endotoxin Level	<0.1 EU per 1 μg of the protein by the 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	SDF-1 alpha/CXCL12 protein functions as a chemoattractant specifically active on T-lymphocytes and monocytes, excluding neutrophils. It activates the C-X-C chemokine receptor CXCR4, inducing a rapid and transient rise in intracellular calcium ions and promoting chemotaxis. Additionally, it binds to the atypical chemokine receptor ACKR3, activating the beta-arrestin pathway and acting as a scavenger receptor for SDF-1. Moreover, it binds to the allosteric site (site 2) of integrins, activating ITGAV:ITGB3, ITGA4:ITGB1, and ITGA5:ITGB1 in a CXCR4-independent manner. Acting as a positive regulator of monocyte migration and a negative regulator of monocyte adhesion through the LYN kinase, it stimulates migration of monocytes and T-lymphocytes via CXCR4 and ACKR3, while decreasing monocyte adherence to ICAM-1-coated surfaces. The SDF1A/CXCR4 signaling axis inhibits beta-2 integrin LFA-1-mediated adhesion of monocytes to ICAM-1 through LYN kinase. It plays a protective role after myocardial infarction and induces down-regulation and internalization of ACKR3. Crucially, SDF-

1 alpha/CXCL12 is indispensable during embryonic development, participating in B-cell lymphopoiesis, myelopoiesis in bone marrow, and heart ventricular septum formation. It stimulates the proliferation of bone marrow-derived B-cell progenitors in the presence of IL7, as well as the growth of stromal cell-dependent pre-B-cells. Existing in monomeric or homodimeric forms, the equilibrium is influenced by non-acidic pH, the presence of multivalent anions, and binding to CXCR4 or heparin. The monomeric form is essential for full chemotactic activity and resistance to ischemia/reperfusion injury, while the dimeric form acts as a partial agonist of CXCR4, stimulating Ca2+ mobilization without chemotactic activity, functioning instead as a selective antagonist that blocks chemotaxis induced by the monomeric form. It interacts with the N-terminus of ACKR3, integrin subunit ITGB3 via the allosteric site (site 2), and TNFAIP6 via the Link domain.

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