

## Product Information

### Stromal Cell-Derived Factor 1 $\alpha$ /Pre-B Cell Growth Stimulating Factor

Mouse, Recombinant  
Expressed in *Escherichia coli*

Product Number **S 5816**

#### Product Description

Recombinant Mouse Stromal Cell-Derived Factor 1 $\alpha$  (SDF-1 $\alpha$ )/Pre-B Cell Growth Stimulating Factor (PBSF) is produced from a DNA sequence encoding the mature mouse SDF-1 $\alpha$  protein sequence (amino acid residues 22-89)<sup>1, 2</sup> expressed in *Escherichia coli*. Recombinant mouse SDF-1 $\alpha$  (68 amino acids) has a predicted molecular mass of approximately 8 kDa.

SDF-1 $\alpha$  and SDF-1 $\beta$  were initially identified using signal sequence trap cloning.<sup>1-3</sup> With this method, cDNAs have been cloned using mouse bone marrow stromal cell lines and human stromal cell lines as cytokines that support the proliferation of a stromal cell-dependent pre-B-cell line.<sup>1-3</sup> SDF-1 $\alpha$  and SDF-1 $\beta$  cDNAs encode precursor proteins of 89 and 93 amino acid residues, respectively. SDF-1 is highly conserved among species with only one amino acid substitution between the human and mouse proteins and 92% homology.<sup>3</sup> SDF-1 $\alpha$  and SDF-1 $\beta$  (together known as SDF-1/PBSF) are encoded by a single gene and arise from alternative splicing. The two proteins are identical except for the four amino acid residues that are present in the carboxy-terminus of SDF-1 $\beta$  and absent from SDF-1 $\alpha$ . The amino acid sequence of SDF-1 identifies the protein as a member of the CXC family of chemokines ( $\alpha$  subfamily) that lacks the ELR domain. Unlike other chemokine  $\alpha$  and  $\beta$  subfamily members that cluster on chromosomes 4 and 17, respectively, the gene for SDF-1 has been mapped to chromosome 10q11.1.

SDF-1 functions as a pre-B cell growth-stimulating factor in the presence of IL-7. It is a potent chemoattractant for T-lymphocytes, monocytes, and pro- and pre-B cells, but not neutrophils.<sup>1, 4</sup> SDF-1 is a ligand for CXCR4 (fusin/LESTR) receptor that functions as a co-receptor for lymphocyte-tropic HIV-1 strains.<sup>4, 5</sup> By signaling through the receptor, SDF-1 may serve as an inhibitor of HIV-1 which utilizes the LESTR/fusin receptor as a point of entry.<sup>4</sup> Mice lacking SDF-1 or CXCR4 have been shown to have impaired B-lymphopoiesis,<sup>6</sup> myelopoiesis,<sup>6</sup> vascular development,<sup>7</sup>

cardiogenesis,<sup>7</sup> and abnormal neuronal cell migration<sup>6, 8</sup> and patterning<sup>8</sup> in the central nervous system.

SDF-1, unlike other chemokine family members, is constitutively expressed in a wide variety of tissues including pancreas, spleen, ovary, and small intestine.<sup>1-3</sup>

#### Reagent

Recombinant Mouse Stromal Cell-Derived Factor 1 $\alpha$  (SDF-1 $\alpha$ ) is supplied as approximately 10  $\mu$ g of protein lyophilized from a 0.2  $\mu$ m filtered solution in 30% acetonitrile and 0.1% trifluoroacetic acid (TFA) containing 0.5 mg bovine serum albumin.

#### Preparation Instructions

Reconstitute the contents of the vial using sterile phosphate-buffered saline (PBS) containing 0.1% human serum albumin or bovine serum albumin. Prepare a stock solution of at least 10  $\mu$ g/ml.

#### Storage/Stability

Prior to reconstitution, store at  $-20^{\circ}\text{C}$ . Reconstituted product may be stored at  $2^{\circ}\text{C}$  to  $8^{\circ}\text{C}$  for up to one month. For prolonged storage, freeze in working aliquots at  $-20^{\circ}\text{C}$ . Avoid repeated freezing and thawing. Do not store in a frost-free freezer.

#### Product Profile

Recombinant Mouse Stromal Cell-Derived Factor 1 $\alpha$  (SDF-1 $\alpha$ ) is measured by its ability to chemoattract cultured human lymphocytes and mouse BaF3 cells transfected with human CXCR4.

The ED<sub>50</sub> for this effect is typically 3 to 9 ng/ml (human lymphocytes) and 0.15-0.6 ng/ml (mouse BaF3 cells).

The ED<sub>50</sub> is defined as the effective concentration of growth factor that elicits a 50% increase in cell growth in a cell based bioassay.

Purity: >97 % as determined by SDS-PAGE, visualized by silver stain.

Endotoxin: <0.1 ng/μg determined by the LAL (*Limulus* amoebocyte lysate) method.

#### References

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4. Bleul, C., et al., The lymphocyte chemoattractant SDF-1 is a ligand for LESTR/fusin and blocks HIV-1 entry. *Nature*, **382**, 829-833 (1996).
5. Oberlin, E. et al., The CXC chemokine SDF-1 is the ligand for LESTR/fusin and prevents infection by T-cell-line-adapted HIV-1. *Nature*, **382**, 833-835 (1996).
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7. Tachibana, K., et al., The chemokine receptor CXCR4 is essential for vascularization of the gastrointestinal tract. *Nature*, **393**, 591-594 (1998).
8. Zou, Y.R., et al., Function of the chemokine receptor CXCR4 in haematopoiesis and in cerebellar development. *Nature*, **393**, 595-599 (1998).

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