CXCL14/BRAK Protein, Human

Cat. No.:	HY-P72683
Synonyms:	C-X-C motif chemokine 14; BRAK; MIP-2G; CXCL14; NJAC; SCYB14
Species:	Human
Source:	E. coli
Accession:	O95715 (S35-E111)
Gene ID:	9547
Molecular Weight:	Approximately 13-15 kDa

PROPERTIES

AA Sequence	S K C K C S R K G P K I R Y S D V K K L E M K P K Y P H C E E K M V I I T T K S V S R Y R G Q E H C L H P K L Q S T K R F I K W Y N A W N E K R R V Y E E
Biological Activity	Measured by its ability to chemoattract THP-1 cells. The ED_{50} for this effect is approximately 0.5965 ng/mL, corresponding to a specific activity is 1.676×10^6 U/mg.
Appearance	Lyophilized powder
Formulation	Lyophilized from a 0.2 μm filtered solution of 20 mM TrisHCl, 1M NaCl, pH 8.5 or 50 mM Tris-HCL, 300 mM NaCl, pH 8.0.
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. For long term storage it is recommended to add a carrier protein (0.1% BSA, 5% HSA, 10% FBS or 5% Trehalose).
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	The chemokine CXCL14 is a highly conserved, homeostatic chemokine which is constitutively expressed in several normal tissues including adipose, brain, breast, cervix, lung, kidney, and skin. CXCL14 is involved in infectious and inflammatory diseases, angiogenesis, and cancer[1][2]. Among chemokines, CXCL14 is highly conserved in mammals with only two amino acids difference between mice and humans. CXCL14 has four conserved cysteine residues that form disulfide bonds7. Also, in common, the first 22 amino acids of the N-terminus are strongly hydrophobic and act as a signal peptide, which is cleaved prior to secretion. Like other chemokines, CXCL14 is a chemoattractant, especially for monocytes, and induces maturation and migration of dendritic

cells (DCs). However, the CXCL14-related migration of monocyte in the absence of prostaglandin E2 (PGE2) is weak, showing that PGE2 is required for CXCL14-related chemotaxis. Responsiveness of monocytes to CXCL14 and PGE2 is specific, and B and T cells do not have any chemotactic response. In addition to monocytes, CXCL14 specifically increases chemotaxis of CD56+ natural killer (NK) cells. Responsible for immune cell recruitment and maturation, as well as impacting epithelial cell motility, CXCL14 contributes to the establishment of immune surveillance within normal epithelial layers. Overall, CXCL14 is responsible for the infiltration of immune cells, maturation of dendritic cells, upregulation of major histocompatibility complex (MHC)-I expression, and cell mobilization. Although fibroblast-derived CXCL14 has a tumor-supportive role, epithelial-derived CXCL14 mainly inhibits tumor progression[1][2].

Many previous studies on CXCL14 have shown contradictory functions of CXCL14: tumor suppression vs. promotion, increased vs. decreased cell migration, angiogenesis vs. angiostasis, and CXCR4 inhibition vs. activation vs. no effect. CXCL14 inhibits chemotaxis of endothelial cells by directly binding to IL-8 and FGF2, thus hindering their interaction with high-affinity receptors on human vascular endothelial cells. Moreover, CXCL14 broadly modulates chemotaxis, differentiation, and activation of various types of immune cells. Furthermore, CXCL14 also shows antimicrobial activity that effectively clears infection of Streptococcus pneumoniae in respiratory tracts[2].

REFERENCES

[1]. Arezoo Gowhari Shabgah, et al. Chemokine CXCL14; a double-edged sword in cancer development. Int Immunopharmacol. 2021 Aug;97:107681.

[2]. Joseph A Westrich, et al. The multifarious roles of the chemokine CXCL14 in cancer progression and immune responses. Mol Carcinog. 2020 Jul;59(7):794-806.

[3]. Galina V Shurin, et al. Loss of new chemokine CXCL14 in tumor tissue is associated with low infiltration by dendritic cells (DC), while restoration of human CXCL14 expression in tumor cells causes attraction of DC both in vitro and in vivo. J Immunol. 2005 May 1;174(9):5490-8.

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