BCA-1/CXCL13 Protein, Human

Cat. No.:	HY-P7131
Synonyms:	rHuBCA-1/CXCL13; C-X-C motif chemokine 13; BCA1; BLC; SCYB13
Species:	Human
Source:	E. coli
Accession:	O43927 (V23-P109)
Gene ID:	10563
Molecular Weight:	Approximately 10.3 kDa

PROPERTIES

AA Sequence	V L E V Y Y T S L R C R C V Q E S S V F I P R R F I D R I Q I L P R G N G C P R K E I I V W K K N K S I V C V D P Q A E W I Q R M M E V L R K R S S S T L P V P V F K R K I P
Biological Activity	Full biological activity determined by a chemotaxis bioassay using human B cells is in a concentration range of 1.0-10 ng/mL.
Appearance	Lyophilized powder
Formulation	Lyophilized after extensive dialysis against 20 mM PB, pH 7.4, 100 mM NaCl.
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	CXCL13, also known as B lymphocyte chemoattractant, is originally identified in stromal cells in B cell follicles as regulating homing of B cells and subsets of T cells. CXCL13 plays a key role in orchestrating cell migration within spatially distinct regions of the secondary lymphoid organs. It strongly attracts B lymphocytes while promoting migration of only small numbers of T cells and macrophages. CXCL13 and its receptor, CXCR5, play fundamental roles in inflammatory, infectious, cancer and immune responses[1][2][3]. The amino acid sequence of human CXCL13 protein has low homology with mouse CXCL13 protein.

CXCL13 exerts its functions through its receptor CXCR5. CXCR5 is highly expressed on mature recirculating B-lymphocytes, a subpopulation of follicular helper T cells (TFH) and skin-derived migratory dendritic cells (DCs), and controls their migration into secondary lymphoid organs towards the gradient of CXCL13. As the loss of the BLR1/CXCR5 receptor is sufficient to disrupt organization of follicles in spleen and Peyer's patches, BCA-1 may act as a B cell homing chemokine. Human BCA-1 competes with radiolabeled IFN-γ inducible protein 10 (IP-10) for binding to the human CXCR3 receptor expressed in Ba/F3 and 293EBNA cell lines. Furthermore, human BCA-1 is an efficacious attractant for human CXCR3 transfected cells. BCA-1 does oes not induce calcium release in B-lymphocytes. In addition, human BCA-1 is an agonist in stimulating GTP gamma S binding. Human BCA-1 is a specific and functional G-protein-linked chemotactic ligand for the human CXCR3 receptor.
CXCL13 has been widely implicated in the pathogenesis of a number of autoimmune diseases and inflammatory conditions, as well as in lymphoproliferative disorders. In addition, the CXCL13:CXCR5 axis orchestrates cell-cell interactions that regulate lymphocyte infiltration within the tumor microenvironment[1][2][3].
Dysregulation of the CXCL13:CXCR5 axis affecting both B- and TFH cell function is major player in autoimmune disorders, and potentially serves as a biomarker for disease progression and therapeutic response. Moreover, expression of CXCR5 and CXCL13 is shown to be dysregulated in HIV infection, such that the number of CXCR5+ B cells decreases with progression of HIV infection, together with an increase in plasma levels of CXCL13. CXCL13/CXCR5 signaling modulates cancer cell ability to grow, proliferate, invade, and metastasize. CXCL13 drives spinal astrocyte activation and neuropathic pain via CXCR5[1][2][3][4].

REFERENCES

[1]. Jenh CH, et al. Human B cell-attracting chemokine 1 (BCA-1; CXCL13) is an agonist for the human CXCR3 receptor. Cytokine. 2001 Aug 7;15(3):113-21.

[2]. Muzammal Hussain, et al. CXCL13/CXCR5 signaling axis in cancer. Life Sci. 2019 Jun 15;227:175-186.

[3]. Marcelo G Kazanietz, et al. CXCL13 and Its Receptor CXCR5 in Cancer: Inflammation, Immune Response, and Beyond. Front Endocrinol (Lausanne). 2019 Jul 12;10:471.

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