SANTA CRUZ BIOTECHNOLOGY, INC.

LIF (mBA-FL): sc-4378

BACKGROUND

Embryonic stem (ES) cells are the focus of much research and represent great therapeutic potential as they can be propagated indefinitely in an undifferentiated state while possessing the ability to differentiate into all embryonic germ layers (endoderm, ectoderm and mesoderm) both *in vivo* and *in vitro*. LIF (leukemia inhibitory factor), also known as MLPLI (melanoma-derived LPL inhibitor), HILDA, DIA or CDF, is a 202 amino acid secreted protein and lymphoid factor that participates in the maintenance of ES cell pluripotency by suppressing spontaneous ES cell differentiation. Secreted LIF precursor is further processed into a biologically active glycoprotein. Expressed by a wide variety of cells including activated T lymphocytes, monocytes, mast cells and neuronal cells, LIF is suggested to promote survival and growth of axons *in vitro* and is involved in immune tolerance at the maternal-fetal interface. LIF may also participate in fat and bone metabolism and regulate epithelial conversion during kidney development.

REFERENCES

1. Gough, N.M., et al. 1988. Molecular cloning and expression of the human homologue of the murine gene encoding myeloid leukemia-inhibitory factor. Proc. Natl. Acad. Sci. USA 8: 2623-2627.
2. Patterson, P.H. 1994. Leukemia inhibitory factor, a cytokine at the interface between neurobiology and immunology. Proc. Natl. Acad. Sci. USA 91: 7833-7835.

SOURCE

LIF (mBA-FL) is produced in *E. coli* as 47 kDa tagged biologically active fusion protein corresponding to amino acids 24-203 of mature LIF of mouse origin.

PRODUCT

LIF (mBA-FL) is purified from bacterial lysates (> 98%); supplied as 50 µg lyophilized protein.

APPLICATIONS

LIF (mBA-FL) is a potent inhibitor of spontaneous embryonic mouse stem cell differentiation.

Molecular Weight of LIF precursor: 22 kDa.

Molecular Weight of mature glycosylated LIF: 40-45 kDa.

RECONSTITUTION

In order to avoid freeze/thaw damaging of the active protein, dilute protein when first used to desired working concentration. Either a sterile filtered standard buffer (such as 50mM TRIS or 1X PBS) or water can be used for the dilution. Store any thawed aliquot in refrigeration at 2° C to 8° C for up to four weeks, and any frozen aliquot at -20° C to -80° C for up to one year. It is recommended that frozen aliquots be given an amount of standard cryopreservative (such as Ethylene Glycol or Glycerol 5-20% v/v), and refrigerated samples be given an amount of carrier protein (such as heat inactivated FBS or BSA to 0.1% v/v) or non-ionic detergent (such as Triton X-100 or Tween 20 to 0.005% v/v), to aid stability during storage.

STORAGE

Store desiccated at -20° C. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

SELECT PRODUCT CITATIONS

1. Ieda, M., et al. 2004. Endothelin-1 regulates cardiac sympathetic innervation in the rodent heart by controlling nerve growth factor expression. J. Clin. Invest. 113: 876-884.
2. Metcalfe, S.M., et al. 2005. Leukaemia inhibitory factor (LIF) is functionally linked to axotrophin and both LIF and axotrophin are linked to regulatory immune tolerance. FEBS Lett. 579: 609-614.
3. Muthukumarana, P.A., et al. 2006. Evidence for functional inter-relationships between FOXP3, leukaemia inhibitory factor, and Axotrophin/MARCH-7 in transplantation tolerance. Int. Immunopharmacol. 6: 1993-2001.
4. Wu, J., et al. 2008. Short-type PB-cadherin promotes self-renewal of spermatogonial stem cells via multiple signaling pathways. Cell. Signal. 20: 1052-1060.
5. Zou, K., et al. 2009. Production of offspring from a germline stem cell line derived from neonatal ovaries. Nat. Cell Biol. 11: 631-636.
6. Yuan, Z., et al. 2009. Generation of mice by transplantation of an adult spermatogonial cell line after cryopreservation. Cell Prolif. 42: 123-131.
7. Gao, W., et al. 2009. Treg versus Th17 lymphocyte lineages are cross-regulated by LIF versus IL-6. Cell Cycle 8: 1444-1450.
8. Park, J., et al. 2011. Modulation of $CD4^+$ T lymphocyte lineage outcomes with targeted, nanoparticle-mediated cytokine delivery. Mol. Pharm. 8: 143-152.
9. Yoshida, A., et al. 2012. *In vitro* tissue engineering of smooth muscle sheets with peristalsis using a murine induced pluripotent stem cell line. J. Pediatr. Surg. 47: 329-335.
10. Wang, B., et al. 2015. Spatiotemporal expression of Math6 during mouse embryonic development. Histochem. Cell Biol. 143: 575-582.
11. Oh, J.Y., et al. 2018. Modulation of Sonic hedgehog-induced mouse embryonic stem cell behaviours through E-cadherin expression and Integrin β1-dependent F-Actin formation. Br. J. Pharmacol. 175: 3548-3562.
12. Wang, J., et al. 2019. Androgen promotes differentiation of $PLZF^+$ spermatogonia pool via indirect regulatory pattern. Cell Commun. Signal. 17: 57.
13. Papathanasiou, M., et al. 2021. Identification of a dynamic gene regulatory network required for pluripotency factor-induced reprogramming of mouse fibroblasts and hepatocytes. EMBO J. 40: e102236.

RESEARCH USE

For research use only, not for use in diagnostic procedures.

PROTOCOLS

See our web site at www.scbt.com for detailed protocols and support products.