



Recombinant Human LIF

Catalog Number SC-043-1 1 million Unit/ml (10ug)
SC-043-2 10 million unit/ml (100ug)

Volume 1 ml

Description Leukemia Inhibitory Factor (LIF), a lymphoid factor, belongs to the interleukin 6 class cytokine¹. LIF binds to the specific LIF receptor (LIFR- α) and forms a heterodimer with the GP130 signal transducing subunit, which leads to the activation of the JAK/STAT and MAPK cascades². LIF is also involved in a wide variety of biological processes including hematopoietic cell proliferation, neuronal survival and formation, and bone formation. It is used to maintain the pluripotency of mouse embryonic stem cell (ESC). Using the current human ESC culture method, human LIF is not required. But recent studies showed that the human ESC is the prime stem cell. The more totipotent human ESC, or called naïve stem cell, which is more like mouse ESC, can be isolated using LIF or induced by introducing Oct4, Sox2, Klf4, cMyc, with small molecules^{3,4} or plus two other factors Nr5a2, and RxRy into the differentiated cells⁵. Human LIF is ~20 kDa protein containing 202 amino acid residues and is active on both human and mouse cells.

Purity > 99% (by SDS Page)
Buffer Phosphate buffered saline with 1% w/v BSA.

Endotoxin Level < 1.0 EU/ μ g as determined by the LAL method

Biologic Activity The specific activity is at least 1×10^6 units/ml, where 50 units is defined as the amount of human LIF required to induce differentiation in 50% of the M1 myeloid leukemia cell colonies in 1 ml agar cultures.

Storage & Handling Store at 4°C. Freeze-thaw should be avoided.

Stability Stable for up to 6 months from date of receipt when stored as directed.

- References**
1. Williams R.L., Hilton, D.J., Pease, S., Willson, T.A., Stewart, C.L., et al (1988) Myeloid leukemia inhibitory factor maintains the developmental potential of embryonic stem cells. *Nature* 336:686-7.
 2. Marina Trouillas, Claire Saucourt, Bertrand Guillotin, Xavier Gauthereau, Jean-Luc Taupin, Jean-François Moreau, H  l  ne B  uf (2009) European Cytokine Network 20:51-62.
 3. Hanna, J., Cheng, A.W., Saha, K., Kim, J., Lengner, C.J., Soldner, F., Cassady, J.P., Muffat, J., Carey, B.W., and Jaenisch, R. (2010) Human embryonic stem cells with biological and epigenetic characteristics similar to those of mouse ESCs. *Proc. Natl. Acad. Sci. USA* 107: 9222-9227.
 4. Xu Y, Zhu X, Hahm HS, Wei W, Hao E, Hayek A, Ding S (2010) Revealing a core signaling regulatory mechanism for pluripotent stem cell survival and self-renewal by small molecules. *PNAS* 107:8129-34.
 5. Wang W, Yang J, Liu H, Lu D, Chen X, Zenonos Z, Campos LS, Rad R, Guo G, Zhang S, Bradley A, Liu P. (2011) Rapid and efficient reprogramming of somatic cells to induced pluripotent stem cells by retinoic acid receptor gamma and liver receptor homolog 1. *PNAS* 108:18283-8.