

**DESCRIPTION**

**Source** *E. coli*-derived mouse LIF protein  
Accession # P09056.1

**Predicted Molecular Mass** 20 kDa

**SPECIFICATIONS**

**SDS-PAGE** Monomeric mouse LIF protein only

**Activity** Supports mouse ES cell propagation in chemically defined, feeder-free iPSC culture

**Endotoxin Level** <0.10 EU per 1 µg of the protein by the LAL method.

**Mass Spectrometry** Single species with expected mass

**Formulation** Lyophilized from acetonitrile/TFA See Certificate of Analysis for details.

**PREPARATION AND STORAGE**

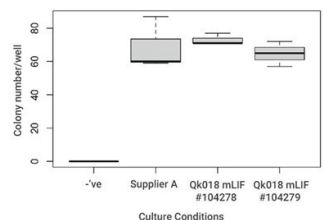
**Reconstitution** Resuspend in 10mM HCl at >100 µg/ml, prepare single use aliquots, add carrier protein if desired.

**Shipping** The product is shipped lyophilized at ambient temperature, on ice blocks or dry ice. Shipping at ambient temperature does not affect the bioactivity or stability of the protein. Upon receipt, store immediately at the conditions stated below.

**Stability & Storage** BulkLotPrefix assignment required for Storage Info

**DATA**

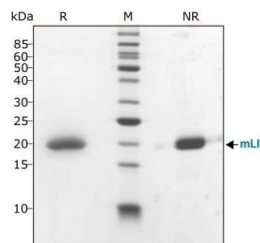
**Bioactivity**



**Recombinant Mouse LIF, Animal-Free Protein Bioactivity**

Recombinant mouse LIF protein (animal-free) supports mouse embryonic stem cell colony formation and has been benchmarked against LIF supplement from Supplier A in chemically-defined feeder-free culture. Mouse LIF (Qk018) support mouse ES cell propagation in chemically-defined, feeder-free iPSC culture. Cultures are dissociated to a single cell suspension and plated at very low (clonal) density in defined media containing Qk018 recombinant mouse LIF or mouse LIF supplement from another supplier (Supplier A). The number of colonies that formed was determined after 4-5 days. Our thanks to Leitch lab, MRC London Institute of Medical Sciences, Imperial College for mouse ES cell data detailed above and discussion.

**SDS-PAGE**



**Recombinant Mouse LIF, Animal-Free Protein SDS-PAGE**

Mouse LIF protein (Qk018) migrates as a single band at 20 kDa in non-reducing (NR) and upon reduction (R) with β-mercaptoethanol. Purified recombinant mouse LIF protein (3 µg) was resolved using 15% w/v SDS-PAGE in reduced (+β-mercaptoethanol, R) and non-reduced conditions (NR) and stained with Coomassie Brilliant Blue R250.

## BACKGROUND

Recombinant mouse LIF (leukemia inhibitory factor) is commonly used in cell culture to maintain the pluripotency of stem cells. LIF is a widely expressed pleiotropic member of the IL-6 family of cytokines (1-3). Mature mouse LIF is expressed as a highly and variably glycosylated 32-62 kDa monomer that shares 78%, 91%, 80%, 76%, and 78% aa sequence identity with human, rat, canine, bovine, and porcine LIF, respectively (4). LIF functions through a heterodimeric receptor complex containing a ligand-binding subunit, LIF R $\alpha$ /CD118, and a signal transducing subunit, gp130 (2, 4, 5). gp130 also serves as a subunit of the receptor complexes for Oncostatin M, Cardiotrophin-1, CNTF, IL-6, IL-11, and IL-27 (2, 5). A soluble form of mouse LIF R $\alpha$  can be generated by alternative splicing (6). Depending on the cells and their context, LIF either opposes or favors differentiation (2, 7). LIF produced by the uterine endometrium supports successful implantation of the embryo, promotes proliferation and maintenance of pluripotency in embryonic stem cells, and favors proliferation of progenitor cell types such as hematopoietic stem cells (2, 5, 7). However, excess LIF blocks differentiation of embryoid bodies, indicating the importance of LIF regulation (2, 5). LIF is produced by activated CD4<sup>+</sup> T cells and is required by the thymic epithelium to support T cell maturation (2, 3). Its expression is upregulated by neuronal injury, and it promotes motor neuron survival and oligodendrocyte myelination (2, 3, 8). It is produced by the adrenal cortex and likely enhances adrenal production of cortisol and aldosterone (9). LIF can also function as an autocrine growth factor in some pancreatic cancers, but it induces differentiation in the myeloid leukemic cell line M1 (1, 10). Tumor cell-derived LIF can also induce formation of immunosuppressive tumor-associated macrophages (11). LIF promotes endometrial remodeling and differentiation of adipocytes and cardiac smooth muscle cells (2, 3, 12). It promotes regulatory T cell and inhibits Th17 cell differentiation, thus down-regulating inflammation and contributing to immune tolerance during pregnancy and in the nervous system (2, 3, 5, 7).

## References:

1. Moreau, J.F. *et al.* (1988) *Nature* **336**:690.
2. Trouillas, M. *et al.* (2009) *Eur. Cytokine Netw.* **20**:51.
3. Metcalfe, S.M. (2011) *Genes Immun.* **12**:157.
4. Gearing, D.P. *et al.* (1987) *EMBO J.* **6**:3995.
5. Cheng, J.G. *et al.* (2001) *Proc. Natl. Acad. Sci. USA* **98**:8680.
6. Tomida, M. *et al.* (1993) *FEBS Lett.* **334**:193.
7. Paiva, P. *et al.* (2009) *Cytokine Growth Factor Rev.* **20**:319.
8. Slaets, H. *et al.* (2010) *Trends Mol. Med.* **16**:493.
9. Bamberger, A.M. *et al.* (2000) *Mol. Cell. Endocrinol.* **162**:145.
10. Kamohara, H. *et al.* (2007) *Int. J. Oncol.* **30**:977.
11. Duluc, D. *et al.* (2007) *Blood* **110**:4319.
12. Zouein, F.A. *et al.* (2013) *Eur. Cytokine Netw.* **24**:11.

## PRODUCT SPECIFIC NOTICES

The above product was manufactured, tested and released by R&D System's contract manufacturer, Qkine Ltd, at 1 Murdoch House, Cambridge, UK, CB5 8HW. The product is for research use only and not for the diagnostic or therapeutic use.