SANTA CRUZ BIOTECHNOLOGY, INC.

LIF (mBA): sc-4989

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 has the ability to induce and suppress differentiation depending on the target cell type. 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.

One of the most intriguing properties of LIF is that it induces the differentiation of M1 myeloid leukemic cells, but suppresses the spontaneous differentiation of embryonic stem (ES) cells, thereby promoting long-term maintenance of the ES phenotype. This unique ability makes LIF an excellent cell culture supplement for both ES cells and M1 cells.

REFERENCES

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SOURCE

LIF (mBA) is produced in *E. coli* as a biologically active, GST-tagged fusion protein corresponding to full length mature leukemia inhibitory factor (LIF) of mouse origin. GST tag is then cleaved to yield 19.7 kDa mature mouse LIF protein > 95% pure by SDS-PAGE and supplied 0.22 micron sterile filtered; tested negative for mycoplasmas.

PRODUCT

LIF (mBA) is purified by HPLC chromatopgraphy from bacterial lysates; supplied as lypohilized protein: 10^6 units (10 µg) (sc-4989) or $5x10^6$ units (50 µg) (sc-4989A).

APPLICATIONS

LIF (mBA) is recommended for use as a cell culture supplement in mouse cell lines. Mature, biologically active, recombinant LIF is indistinguishable from native LIF in its biological activities *in vitro*.

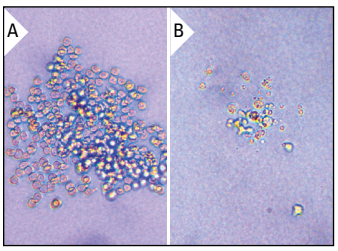
Embryonic Stem Cell Assay: Differentiation Inhibition at 1000 units/ml (0.01 µg)
Murine myeloid leukemic, M1 Assay: Specific Activity ≥ 10^8 units/mg

M1 ASSAY

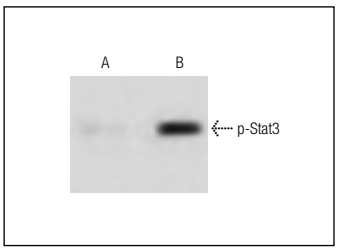
1. The M1 bioassay is performed using *in vitro* semi-solid agar cultures, which contain approximately 100 cells in 1 ml volumes of DME containing 20% FCS in 0.3% agar.
2. Add 100 µl of sample or LIF (hBA) [10^4 units/ml (0.1 µg) in 5% FCS in isotonic saline] in two-fold serial dilutions in duplicate to 35 mm petri dishes.
3. Add 100 µl of 5% FCS in isotonic saline to two control slides.
4. Incubate at 37° C in fully humidified atmosphere of 10% CO_2 in air for seven days.
5. Score the number of colonies that show differentiation.

NOTE: 50 units (0.5 ng) is defined as the amount of activity which results in 50% of the colonies being differentiated.

DATA



LIF (mBA): sc-4989. Undifferentiated mouse M1 cells cultured for 1 week in 0.3% agar medium without LIF (**A**) and differentiated mouse M1 cells cultured for 1 week in 0.3% agar medium with 0.05ng/ml of mouse LIF (**B**).



Mouse LIF (sc-4989) induction of Stat3 p91 phosphorylation of Tyr 705 in untreated (**A**) and LIF-treated (**B**) 3T3-L1 cells. Antibody tested: p-Stat3 (B-7): sc-8059.

RECONSTITUTION

Reconstitute sc-4989 (10 µg) or sc-4989A (50 µg) in 1 ml 1% BSA/PBS. Following reconstitution filter using a 0.22 micron sterile filter.

STORAGE

Store desiccated at -20° C; stable for one year from the date of shipment.

RESEARCH USE

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