

## Cell-Vive™ GMP Recombinant Human LIF (carrier-free)

<b>Catalog# / Size</b>	593924 / 50 µg
<b>Other Names</b>	Leukemia inhibitory factor, HILDA (human interleukin in DA cells), MLPLI (melanoma-derived LPL inhibitor), DIA (differentiation-inducing factor)
<b>Description</b>	<p>Leukemia inhibitory factor (LIF) is a 20 kD protein that belongs to the IL-6 receptor family. It binds to a heterodimeric membrane receptor made up of a LIF-specific subunit, gp190 or LIFR, and the subunit gp130, which is shared with the other members of the IL-6 family. The LIF complex receptor signals through STAT3 and JAK kinases. LIF expression has been observed in various tissues including thymus, lung, and neuronal tissue. LIF displays diverse biological effects but is best known for its ability to inhibit the differentiation of embryonic stem cells in mice and contribute to stem cell self-renewal. Human and mouse LIF share 79% sequence homology and exhibit cross-species activity. However, LIF inhibition of stem cell differentiation appears to be mouse specific. It is involved in the induction of hematopoietic differentiation in normal and myeloid leukemia cells, induction of neuronal cell differentiation, regulation of mesenchymal to epithelial conversion during kidney development, and may also have a role in immune tolerance at the maternal-fetal interface. Alternatively spliced transcript variants encoding multiple isoforms have been observed for this gene. LIF can be upregulated by pro-inflammatory cytokines such as TNFα and IL-17, and elevated levels of LIF have been found in cases of rheumatoid arthritis, neural injury, systemic inflammation, and tuberculosis.</p>
<b>Quality Statement</b>	<p>BioLegend Cell-Vive™ GMP Recombinant proteins are manufactured and tested in accordance with USP Chapter 1043, Ancillary Materials for Cell, Gene and Tissue-Engineered Products and Ph. Eur. Chapter 5.2.12 in a dedicated GMP facility compliant with ISO 13485:2016. Specifications and processes include:</p> <ul style="list-style-type: none"><li>• Low endotoxin level (≤ 0.1 EU/µg)</li><li>• Purity (≥ 95% or higher)</li><li>• Bioburden testing</li><li>• Mycoplasma testing</li><li>• Batch-to-batch consistency</li><li>• Vendor qualification</li><li>• Raw material traceability and documentation</li><li>• Documented procedures and employee training</li><li>• Equipment maintenance and monitoring records</li><li>• Lot-specific certificates of analysis</li><li>• Quality audits per ISO 13485:2016</li><li>• QA review of released products</li></ul>

## Product Details

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<b>Source</b>	Human LIF, amino acids (Ser23-Phe202) (Accession# NP_002300.1), was expressed in <i>E. coli</i> .
<b>Molecular Mass</b>	The 180 amino acid recombinant protein has a predicted molecular mass of approximately 20 kD. The protein migrates at about 20 kD in DTT-reducing conditions and about 18 kD in non-reducing condition by SDS-PAGE. The N-terminal amino acid is Ser.
<b>N-terminal Sequence Analysis</b>	Ser-Pro-Leu-Pro-Ile-Thr-Pro-Val-Asn-Ala
<b>Purity</b>	≥ 95%, as determined by Coomassie stained SDS-PAGE
<b>Formulation</b>	Protein was lyophilized from 0.22 µm filtered solution containing PBS, pH 7.4
<b>Endotoxin Level</b>	Less than or equal to 0.1 EU per µg of protein as determined by LAL method
<b>Residual Host Cell Protein Content</b>	≤ 0.500 ng/µg by ELISA
<b>Concentration</b>	50 µg size is lyophilized

<b>Storage &amp; Handling</b>	Unopened vial can be stored between 2°C and 8°C for up to 2 weeks, at -20°C or colder until the expiration date. Reconstitute lyophilized protein in sterile PBS. Before reconstitution, make sure sterile PBS and product are at room temperature. Quickly spin the vial or gently tap down on the vial to make sure the lyophilized product is at the bottom of the vial before opening. Use aseptic techniques to add the required volume of reconstitution buffer (sterile PBS) to the vial, to obtain the recommended stock concentration 250 µg/mL. Close the vial and leave at ambient temperature for 15-20 minutes. Then gently invert the vial several times or until all of the lyophilized product dissolves. Leave the vial at room temperature for another 15 minutes. If small particulates are still observed after 15 minutes, incubate at room temperature for an additional 30 minutes and leave the vial at 2°C - 8°C overnight. Next day, invert the vial several times or gently pipette the solution up and down before use. If needed, transfer the reconstituted stock solution to a sterile container for additional dilution to no less than 100 µg/mL. Small working aliquots in polypropylene tubes can be made after reconstitution and store the vials at -20°C or lower. Avoid freeze/ thaw cycles. Carrier protein such as 0.2 - 1% endotoxin-free BSA or HSA can be added when preparing the stock solution. Aliquots can be stored between 2°C and 8°C for up to two weeks or stored at -20°C or colder for up to 3 months.
<b>Activity</b>	Human LIF induces proliferation of TF-1 cells in a dose-dependent manner. ED <sub>50</sub> = 0.03-0.12 ng/mL. The specific activity of Cell-Vive™ GMP Recombinant Human LIF (carrier-free) is ≥1.4 x 10 <sup>7</sup> IU/mg when compared against the WHO International Standard for Human LIF (NIBSC code: 93/562).
<b>Application</b>	<a href="#">Bioassay - Quality tested</a>
<b>Application Notes</b>	Our lyophilized proteins are validated in-house to maintain activity after shipping at ambient temperature and are backed by our <a href="#">100% satisfaction guarantee</a> . If you have any concerns, contact us at <a href="mailto:tech@biolegend.com">tech@biolegend.com</a> .
<b>Application References</b>	1. Li P, <i>et al.</i> 2022. <i>EMBO Mol Med.</i> 14:e14511. <a href="#">PubMed</a>
<b>(PubMed link indicates BioLegend citation)</b>	
<b>Disclaimer</b>	BioLegend Cell-Vive™ GMP Recombinant proteins are for research use only. Suitable for <i>ex vivo</i> cell processing. Not for injection or diagnostic or therapeutic use. Not for resale. BioLegend will not be held responsible for patent infringement or other violations that may occur with the use of our products.

## Antigen Details

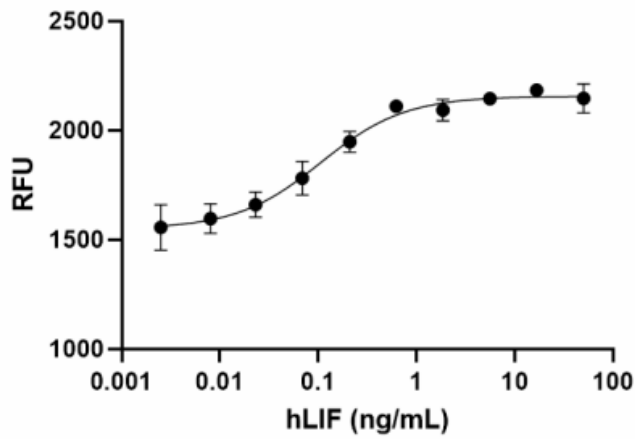
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<b>Bioactivity</b>	Human LIF induces proliferation of TF-1 cells.
<b>Cell Sources</b>	Expressed in the trophectoderm of the developing embryo, activated CD4+ T cells.
<b>Cell Targets</b>	Embryonic stem cells.
<b>Receptors</b>	LIFR complex (gp190 and gp130).
<b>Antigen References</b>	<ol style="list-style-type: none"> <li>1. Moreau JF, <i>et al.</i> 1988. <i>Nature.</i> 336:690.</li> <li>2. Tomida M, <i>et al.</i> 1993. <i>FEBS Lett.</i> 334:193.</li> <li>3. Metcalfe SM. 2011. <i>Genes Immun.</i> 12:157.</li> <li>4. Voyle RB, <i>et al.</i> 1999. <i>Exp. Cell Res.</i> 249:199.</li> <li>5. Slaets H, <i>et al.</i> 2010. <i>Trends Mol. Med.</i> 16:493.</li> <li>6. Souza PP, <i>et al.</i> 2012. <i>Mol. Immunol.</i> 49:601.</li> </ol>
<b>Regulation</b>	Inhibits embryonic stem cell differentiation, induces the terminal differentiation of myeloid leukemia cells. LIF is upregulated by TNFα and IL-17. LIF is downregulated by IL-4 and IL-13 in fibroblasts
<b>Gene ID</b>	<a href="#">3976</a>

## Product Data

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Human leukemia inhibitory factor (LIF) induces proliferation of TF-1 cells in a dose dependent manner.



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