

Product data sheet



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| MedKoo Cat#: 318085 Name: Lamivudine CAS#: 134678-17-4 Chemical Formula: C ₈ H ₁₁ N ₃ O ₃ S Exact Mass: 229.0521 Molecular Weight: 229.2562 | |
| Product supplied as: Powder | |
| Purity (by HPLC): ≥ 98% | |
| Shipping conditions: Ambient temperature | |
| Storage conditions: Powder: -20°C 3 years; 4°C 2 years. In solvent: -80°C 3 months; -20°C 2 weeks. | |

1. Product description:

Lamivudine is an antiretroviral medication used to prevent and treat HIV/AIDS and used to treat chronic hepatitis B. It is of the nucleoside analog reverse transcriptase inhibitor (NRTI) class. Lamivudine is on the World Health Organization's List of Essential Medicines, a list of the most important medication needed in a basic health system.

2. CoA, QC data, SDS, and handling instruction

SDS and handling instruction, CoA with copies of QC data (NMR, HPLC and MS analytical spectra) can be downloaded from the product web page under "QC And Documents" section. Note: copies of analytical spectra may not be available if the product is being supplied by MedKoo partners. Whether the product was made by MedKoo or provided by its partners, the quality is 100% guaranteed.

3. Solubility data

| Solvent | Max Conc. mg/mL | Max Conc. mM |
|---------|-----------------|--------------|
| DMSO | 38.0 | 165.75 |
| H2O | 47.0 | 205.01 |

4. Stock solution preparation table:

| Concentration / Solvent Volume / Mass | 1 mg | 5 mg | 10 mg |
|---------------------------------------|------|-------|-------|
| 1 mM | 4.36 | 21.81 | 43.62 |
| 5 mM | 0.87 | 4.36 | 8.72 |
| 10 mM | 0.44 | 2.18 | 4.36 |
| 50 mM | 0.09 | 0.44 | 0.87 |

5. Molarity Calculator, Reconstitution Calculator, Dilution Calculator

Please refer the product web page under section of "Calculator"

6. Recommended literature which reported protocols for in vitro and in vivo study

In vitro study

- Zheng PY, Zhang DY, Lu GF, Yang PC, Qi YM, Wang BS. Effects of lamivudine on the function of dendritic cells derived from patients with chronic hepatitis B virus infection. *World J Gastroenterol.* 2007 Sep 14;13(34):4641-5. doi: 10.3748/wjg.v13.i34.4641. PMID: 17729422; PMCID: PMC4611843.
- Yamada K, Kaneko H, Shimizu H, Suzumura A, Namba R, Takayama K, Ito S, Sugimoto M, Terasaki H. Lamivudine Inhibits Alu RNA-induced Retinal Pigment Epithelium Degeneration via Anti-inflammatory and Anti-senescence Activities. *Transl Vis Sci Technol.* 2020 Jul 1;9(8):1. doi: 10.1167/tvst.9.8.1. PMID: 32855848; PMCID: PMC7422901.

In vivo study

- Yamada K, Kaneko H, Shimizu H, Suzumura A, Namba R, Takayama K, Ito S, Sugimoto M, Terasaki H. Lamivudine Inhibits Alu RNA-induced Retinal Pigment Epithelium Degeneration via Anti-inflammatory and Anti-senescence Activities. *Transl Vis Sci Technol.* 2020 Jul 1;9(8):1. doi: 10.1167/tvst.9.8.1. PMID: 32855848; PMCID: PMC7422901.
- Wang Y, Xu S, Li S, Su H, Chang S, Li Y, Sun X, Zhao P, Cui Z. Lamivudine Inhibits the Replication of ALV-J Associated Acutely Transforming Virus and its Helper Virus and Tumor Growth In vitro and In vivo. *Front Microbiol.* 2015 Dec 1;6:1306. doi: 10.3389/fmicb.2015.01306. PMID: 26648914; PMCID: PMC4664723.

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7. Bioactivity

Biological target:

Lamivudine (BCH-189) is a nucleoside reverse transcriptase inhibitors (NRTIs) that inhibits HIV reverse transcriptase 1/2 and also the reverse transcriptase of hepatitis B virus.

In vitro activity

The aim of this study was to investigate if the nucleoside analogue lamivudine (LAM), a potent inhibitor of HBV replication, could restore the function of dendritic cells derived from patients with chronic hepatitis B (CHB) in an Asian population. Dendritic cells (DCs) derived from mononuclearcytes of patients with chronic HBV infection were cultured in the presence of IL-4, granulocyte-macrophage colony-stimulating factors (GM-CSF) and gradient concentrations of LAM (0-2 mmol/L). The expression of CD1 α on DC treated with 0.5 mmol/L LAM (LAM-DC 0.5 mmol/L) was significantly higher than that of DC untreated with LAM (54.1 ± 4.21 vs 33.57 ± 3.14 , $P < 0.05$), and so was the expression of CD83 (20.24 ± 2.51 vs 12.83 ± 2.12 , $P < 0.05$) as well as the expression of HLA-DR (74.5 ± 5.16 vs 52.8 ± 2.51 , $P < 0.05$). Compared with control group, LAM-DC group (0.5 mmol/L) secreted significantly more IL-12 (910 ± 91.5 vs 268 ± 34.3 pg/mL, $P < 0.05$), had lower levels of IL-6 in the culture supernatant (28 ± 2.6 vs 55 ± 7.36 pg/mL, $P < 0.05$), markedly enhanced the stimulatory capacity in the allogeneic mixed leukocyte reaction (MLR) (1.87 ± 0.6 vs 1.24 ± 0.51 , $P < 0.05$). This indicates that, in addition to its potent anti-HBV replication role, LAM is able to modify the biological activities of DCs derived from patients with CHB infection. Therefore, LAM can be a potential candidate as an immunoregulatory therapeutic remedy used in the treatment of patients with CHB infection.

World J Gastroenterol. 2007 Sep 14;13(34):4641-5. <https://pubmed.ncbi.nlm.nih.gov/17729422/>

In vivo activity

The modulatory effects of 3TC (lamivudine) on Alu RNA-induced IL-18 and IL-1 β expression were examined in mouse RPE (retinal pigment epithelium) by a subretinal injection of Alu RNA and concomitant intravitreal injection of equimolar 3TC or 3,4-(M)CA. Similar to effects in cultured human RPE cells, 3TC suppressed Alu RNA-induced IL-18 expression by $42.1 \pm 8.7\%$ ($P = 0.006$) and IL-1 β expression by $57.8 \pm 12.4\%$ ($P = 0.030$) compared with that observed by 3,4-(M)CA treatment (Figs. 2A and B). Fundus imaging of mouse eye at 7 days after subretinal transfection and intravitreal injection of 3,4-(M)CA revealed substantial retinal/RPE degeneration, whereas intravitreal injection of 3TC substantially reduced Alu RNA-induced retinal/RPE degeneration (Figs. 2C and D). This data suggests that Alu RNA accumulation contributes to RPE cell senescence in age-related macular degeneration and that this pathogenic process can be suppressed by 3TC.

Transl Vis Sci Technol. 2020 Jul; 9(8): 1. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7422901/>

Note: The information listed here was extracted from literature. MedKoo has not independently retested and confirmed the accuracy of these methods. Customer should use it just for a reference only.