Cyclic-di-GMP sodium

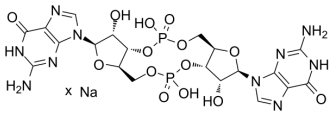
Cat. No.: HY-107780A

Molecular Formula: $C_{20}H_{24}N_{10}NaO_{14}P_2$

Target: STING; Endogenous Metabolite

Pathway: Immunology/Inflammation; Metabolic Enzyme/Protease

Storage: Please store the product under the recommended conditions in the Certificate of Analysis.



BIOLOGICAL ACTIVITY

Description

Cyclic-di-GMP sodium is a STING agonist and a bacterial second messenger that coordinates different aspects of bacterial growth and behavior, including motility, virulence, biofilm formation, and cell cycle progression. Cyclic-di-GMP sodium has anti-cancer cell proliferation activity and also induces elevated CD4 receptor expression and cell cycle arrest. Cyclic-di-GMP sodium can be used in cancer research[1][2][3][4].

IC_{50} & Target

STING[1][2][3][4].

In Vitro

Cyclic-di-GMP sodium (0.5-50 μM; 5 days) inhibits proliferation of human colon cancer cells[1].
Cyclic-di-GMP sodium (0.5-50 μM; 5 days) specifically elevates CD4 expression in Jurkat cells[2].
Cyclic-di-GMP sodium (0.5-50 μM; 5 days) induces cell cycle arrest at the S-phase in Jurkat cells[2].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Proliferation Assay[1]

Cell Line:	H508 cells
Concentration:	0.5-50 μM
Incubation Time:	5 days
Result:	Reduced basal H508 cell proliferation by approx 15%, even inhibited acetylcholine- and EGF-induced cell proliferation.

Cell Viability Assay[2]

Cell Line:	Jurkat cells
Concentration:	50 μM
Incubation Time:	24 h
Result:	Specifically induced of CD4 (no effect on the expression of CD8), with a 6.3-fold upregulation over control and in a dose-dependent manner.

Cell Cycle Analysis[2]

Cell Line:	Jurkat cells
Concentration:	50 μM
Incubation Time:	24 h
Result:	Increased the percentage of cells in S-phase by 79%, with almost complete disappearance of G2/M-phase cells which decreased by 93%.

In Vivo

Cyclic-di-GMP sodium (100 μg/per; i.v.; two sequential vaccinations 9 days apart) enhances TriVax-induced immune responses to melanoma in mice and further increased the anti-tumor effects of TriVax[3].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	C57BL/6 (B6) mice (8- to 10-week-old)[3].
Dosage:	100 μg/per
Administration:	Intravenous injection; two sequential vaccinations 9 days apart; combine with TriVax.
Result:	Significantly higher numbers of antigen-specific CD8 T cells when combined with TriVax. (TriVax consisted of a mixture of 120 μg Pam-hgp100, 100 μg hgp100 or 100 μg Ova, 50 or 25 μg anti-CD40 antibody, and 25 μg Poly-IC). Enhanced the anti-tumor activity of TriVax.

CUSTOMER VALIDATION

- Mbio. 2021 Oct 26;12(5):e0119221.

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REFERENCES

[1]. Karaolis DK, et al. 3',5'-Cyclic diguanylic acid (c-di-GMP) inhibits basal and growth factor-stimulated human colon cancer cell proliferation. Biochem Biophys Res Commun. 2005 Apr 1;329(1):40-5.

[2]. Steinberger O, et al. Elevated expression of the CD4 receptor and cell cycle arrest are induced in Jurkat cells by treatment with the novel cyclic dinucleotide 3',5'-cyclic diguanylic acid. FEBS Lett. 1999 Feb 5;444(1):125-9.

[3]. Wang Z, et al. STING activator c-di-GMP enhances the anti-tumor effects of peptide vaccines in melanoma-bearing mice. Cancer Immunol Immunother. 2015 Aug;64(8):1057-66.

[4]. Jenal U, et al. Cyclic di-GMP: second messenger extraordinaire. Nat Rev Microbiol. 2017 May;15(5):271-284.

Caution: Product has not been fully validated for medical applications. For research use only.

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