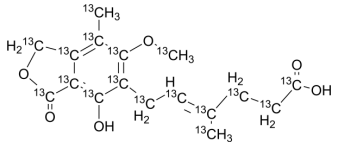
Mycophenolic acid-$^{13}C_{17}$

Cat. No.:	HY-B0421S2
CAS No.:	1202866-92-9
Molecular Formula:	$^{13}C_{17}H_{20}O_6$
Molecular Weight:	337.21
Target:	Isotope-Labeled Compounds; Flavivirus
Pathway:	Others; Anti-infection
Storage:	Please store the product under the recommended conditions in the Certificate of Analysis.



BIOLOGICAL ACTIVITY

Description	Mycophenolic acid-13C17 (Mycophenolate-13C17) is the 13C labeled Mycophenolic acid (HY-B0421). Mycophenolic acid is a potent uncompetitive inosine monophosphate dehydrogenase (IMPDH) inhibitor with an EC50 of 0.24 μM. Mycophenolic acid demonstrates antiviral effects against a wide range of RNA viruses including influenza. Mycophenolic acid is an immunosuppressive agent. Antiangiogenic and antitumor effects.
IC_{50} & Target	Mycophenolic acid (MPA) is an immunosuppressant drug used to prevent rejection in organ transplantation. It inhibits an enzyme needed for the growth of T cells and B cells. Mycophenolic acid (MPA) did not block the initial phase of viral translation but did interfere with viral protein synthesis in the amplification phase. Quantitative RT-PCR demonstrated that MPA prevented the accumulation of viral positive- and negative-strand RNA as the infection proceeded. Mycophenolic acid (MPA) inhibits flavivirus infection by preventing synthesis and accumulation of viral RNA[1]. The effects of Mycophenolic acid (MPA) on DEN replication in monkey kidney (LLC-MK2) cells were examined. MPA (IC_{50}=0.4+/-0.3 microM) inhibited DEN2 replication. Quantitative real-time RT-PCR of viral RNA and plaque assays of virions from DEN2-infected and Mycophenolic acid (MPA) (10 microM) -treated cells showed a fivefold increase in defective viral RNA production by cells treated with each drug. suggesting that one mode of antiviral action of MPA is by inhibition of inosine monophosphate dehydrogenase and thereby depletion of the intracellular GTP pool[2].
In Vitro	Stable heavy isotopes of hydrogen, carbon, and other elements have been incorporated into drug molecules, largely as tracers for quantitation during the drug development process. Deuteration has gained attention because of its potential to affect the pharmacokinetic and metabolic profiles of drugs[1]. Mycophenolic acid demonstrates antiviral effects against a wide range of RNA viruses including influenza, dengue virus, Zika virus, rotavirus, CCHFV, and hantavirus[2]. IMPDH is the rate-limiting enzyme in the de novo synthesis of guanosine nucleotides[3]. Mycophenolic acid (0.01-1 μM; 72 hours) exhibits preferential antiproliferative activity against the endothelial cells and fibroblasts. Endothelial cells are most sensitive cells to Mycophenolic acid treatment with an IC_{50} <500 nM for antimitotic effects[4]. Fibroblasts are also prone to Mycophenolic acid-induced cell cycle inhibition but exhibit a higher IC_{50} (<1 μM) compared with endothelial cells. The two human tumor cell lines A549 non-small cell lung cancer cells and PC3 prostate cancer cells show intermediate sensitivity with an IC_{50} >1 μM. U87 glioblastoma cells are resistant against MPA treatment up to 1 μM[3]. Mycophenolic acid (0.05-2 μM; 18 hours) exhibits a dose-dependent down-regulation of HDAC2 and MYC, whereas up-regulates NDRG1[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

REFERENCES

[1]. Sophie Domhan, et al. Molecular mechanisms of the antiangiogenic and antitumor effects of mycophenolic acid. Mol Cancer Ther. 2008 Jun;7(6):1656-68.

[2]. Stephen R Welch, et al. Screening and Identification of Lujo Virus Inhibitors Using a Recombinant Reporter Virus Platform. Viruses. 2021 Jun 28;13(7):1255.

[3]. Russak EM, et al. Impact of Deuterium Substitution on the Pharmacokinetics of Pharmaceuticals. Ann Pharmacother. 2019 Feb;53(2):211-220.

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