Remdesivir

RNA-dependent RNA polymerase (RdRp) inhibitor; GS-5734

Catalog Code: inh-rem

https://www.invivogen.com/remdesivir

For research use only

Version 20F26-ED

PRODUCT INFORMATION

Contents

- 1 mg Remdesivir

Storage and stability

- Remdesivir is provided as a dried powder and shipped at room temperature. Upon receipt, store product at -20 °C.
- Upon resuspension of Remdesivir in DMSO prepare aliquots and store at -20 °C. Resuspended product is stable for up to 6 months when properly stored at -20 °C .
- Avoid repeated freeze-thaw cycles.

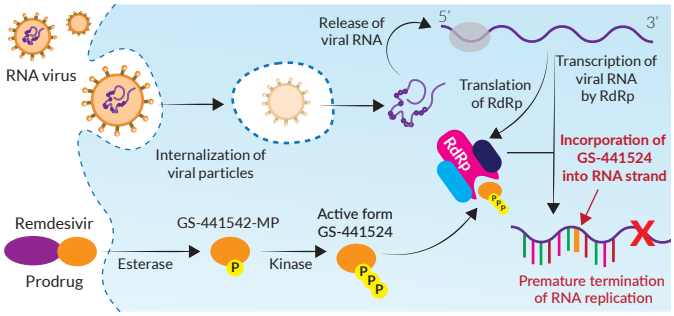
Quality control

- Purity: ≥95% (UHPLC)
- Absence of bacterial contamination (e.g. lipoproteins and endotoxins) has been confirmed using HEK-Blue™ TLR2 and TLR4 cellular assays.

PRODUCT DESCRIPTION

Remdesivir, also known as GS-5734, is a 1'-cyano-substituted adenosine nucleotide analogue prodrug that shows broad-spectrum antiviral activity. Remdesivir was originally developed as an anti-viral against Ebola virus[1] but since has been shown to attenuate viral loads of a number of RNA viruses including respiratory syncytial virus (RSV) and β-coronaviruses such as SARS-CoV, MERS-CoV, and SARS-CoV-2[1-3].

Remdesivir specifically inhibits the activity of the viral RNA-dependent RNA-polymerase (RdRp), essential in viral replication[3-5]. Upon entry into the cell, Remdesivir is rapidly metabolized into a nucleoside monophosphate (GS-441542 MP), which is then further processed into an active triphosphate form (GS-441524). GS-441524 is an adenosine triphosphate (ATP) analog and is thus, able to be used as a substrate by viral RdRp. GS-441524 competes with ATP for incorporation into the newly synthesized RNA strand, ultimately causing premature termination of the RNA product. However, unlike classic chain-terminators, its incorporation at position *i* causes delayed chain-termination downstream of its inclusion site (i.e. *i+3* and *i+5*)[3, 4].



Importantly, it has been established that GS-441524 evades proofreading by the viral exoribonuclease (ExoN)[5].

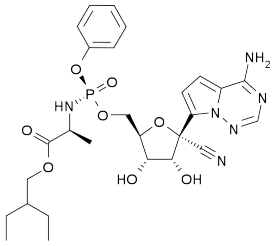
Remdesivir has been shown to have no significant inhibitory activity on human RNA Pol II and mitochondrial RNA polymerase (h-mtRNAP)[1].

Recently, Remdesivir has been shown to exhibit protective effects *in vitro* against non-alcoholic fatty liver disease (NAFLD), by inhibiting pro-inflammatory signaling mediated by STING[6].

1. Warren, T.K. *et al.* 2016. Therapeutic efficacy of the small molecule GS-5734 against Ebola virus in rhesus monkeys. Nature 531, 381-385. **2. Gordon, C.J. *et al.* 2020.** The antiviral compound remdesivir potently inhibits RNA-dependent RNA polymerase from Middle East respiratory syndrome coronavirus. J Biol Chem **3. Gordon, C.J. *et al.* 2020.** Remdesivir is a direct-acting antiviral that inhibits RNA-dependent RNA polymerase from severe acute respiratory syndrome coronavirus 2 with high potency. J Biol Chem 295, 6785-6797. **4. Tchesnokov, E.P. *et al.* 2019.** Mechanism of Inhibition of Ebola Virus RNA-Dependent RNA Polymerase by Remdesivir. Viruses 11. **5. Agostini, M.L. *et al.* 2018.** Coronavirus Susceptibility to the Antiviral Remdesivir (GS-5734) Is Mediated by the Viral Polymerase and the Proofreading Exoribonuclease. mBio 9 **6. Li, Y.N. & Su, Y. 2020.** Remdesivir attenuates high fat diet (HFD)-induced NAFLD by regulating hepatocyte dyslipidemia and inflammation via the suppression of STING. Biochem Biophys Res Commun 526, 381-388.

CHEMICAL PROPERTIES

- Synonym: GS-5734
- CAS number: 1809249-37-3
- Formula: $C_{27}H_{35}N_6O_8P$
- Molecular weight: 602.58 g/mol
- Solubility:
  - 100 mg/mL (165.95 mM) in DMSO
  - 25 mg/ml (41.48 mM) in Ethanol



METHODS

Preparation of 2 mg/ml (3.32 mM) stock solution of Remdesivir

1. Resuspend Remdesivir in 500 µl of DMSO . Mix by vortexing.
2. Use immediately or store aliquots at -20 °C.

Note: Subsequent dilutions into the working concentration range can be performed with sterile water

Working concentration range:

- 0.01 - 1 µM (viral RdRp inhibition in published cell culture assays)[5]

Note: Cellular cytotoxicity is observed at concentrations greater than 10 µM (CC_{50} >10µM)[5]

RELATED PRODUCTS

Product	Description	Cat. Code
Chloroquine	Inhibitor	tlrl-chq
Bafilomycin A1	Inhibitor	tlrl-baf1
Ruxolitinib	Inhibitor	tlrl-rux

TECHNICAL SUPPORT
InvivoGen USA (Toll-Free): 888-457-5873
InvivoGen USA (International): +1 (858) 457-5873
InvivoGen Europe: +33 (0) 5-62-71-69-39
InvivoGen Hong Kong: +852 3622-3480
E-mail: info@invivogen.com