

Product Data Sheet

Product Name: Molnupiravir

Cat. No.: GC62162

Chemical Properties

Cas. No. 2492423-29-5; 2349386-89-4

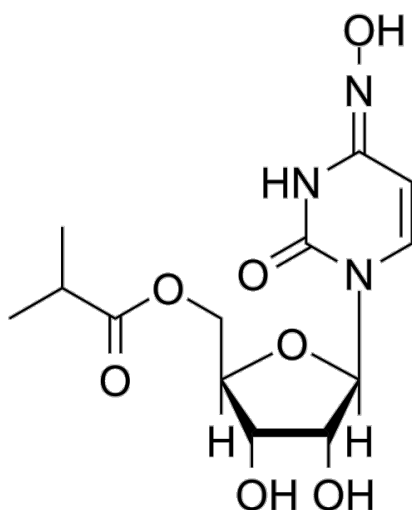
Formula $C_{13}H_{19}N_3O_7$ M.Wt 329.31

Solubility DMSO : 100 mg/mL (303.67 mM; Need ultrasonic) Storage Store at -20°C

General tips For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.

Structure



Protocol

Cell experiment [1]:

Cell lines Vero cells

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

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Preparation Method Vero cells were cultured in Dulbecco Modified Eagle Medium (DMEM), containing 10% fetal bovine serum, in a 37°C CO₂ incubator. Vero cells were seeded in 12-well cell culture plates (2×10⁵ cells per well), and Porcine epidemic diarrhea virus (PEDV) [infection multiplicity (MOI)=0.1] and different concentrations of Molnupiravir (0, 1.5, 3.0, 6.0, 12.0, 24.0, 48.0, 96.0, and 192.0μM) were added. The plates were incubated at 4°C for 1 hour. The blank control group used DMSO. Then, the culture medium was discarded, and the plates were washed three times with pre-cooled phosphate-buffered saline (PBS). The viral infection level was quantified by RT-qPCR.

Reaction Conditions 0, 1.5, 3.0, 6.0, 12.0, 24.0, 48.0, 96.0, and 192.0μM; 1h

Applications Molnupiravir reduced the viral genome copy number and viral titer of PEDV in Vero cells in a dose-dependent manner.

Animal experiment [2]:

Animal models Female ferrets

Preparation Method Female ferrets (6 to 8 months old) were housed in an ABSL-2 (animal biosafety level 2) facility. After a one-week rest, the ferrets were weighed and randomly grouped. Ferrets were anesthetized and intranasally infected with 1×10⁵ pfu [A/California/07/2009 (H1N1)] (infection volume=200μl). Within 3.5 days after infection (pi), Molnupiravir (100mg/kg) was administered orally twice daily, and the control group received the same volume of solvent (1% methylcellulose aqueous solution). Implantable telemetry sensors were used to continuously monitor body temperature (readings taken every 2 to 15 minutes). Nasal rinse fluid (collected every 12 hours) and nasal concha (upper respiratory tract) samples were collected to detect viral load.

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Dosage form 100mg/kg; twice day for 3.5 days; p.o.

Applications Molnupiravir administration alleviated fever and reduced virus load in influenza virus-infected ferrets.

References:

[1] Huang Z X, Zhou S T, Yang Z B, et al. Molnupiravir inhibits porcine epidemic diarrhea virus infection in vitro[J]. Viruses, 2023, 15(6): 1317.

[2] Toots M, Yoon J J, Cox R M, et al. Characterization of orally efficacious influenza drug with high resistance barrier in ferrets and human airway epithelia[J]. Science translational medicine, 2019, 11(515): eaax5866.

Background

Molnupiravir is the 5'-isobutyrate prodrug of the antiviral ribonucleoside analogue β -D-N4-hydroxycytidine (NHC) [1]. Molnupiravir rapidly appears in plasma and is converted to the triphosphate form in cells, which is incorporated into viral RNA in place of cytosine or uracil by RNA-dependent RNA polymerase (RdRp), causing a break of viral replication[2]. Molnupiravir has been used as an oral antiviral drug to inhibit various RNA virus infections in different cell models and animal models[3].

In vitro, Molnupiravir treatment for 48 hours significantly inhibited the replication of WT SARS-CoV-2 and Omicron SARS-CoV-2 in Calu-3 cells, with IC₅₀ values of 1.965 μ M and 0.7556 μ M, respectively[4]. 62.5 μ M of Molnupiravir treatment for 72 hours inhibited viral release and replication in fcfw-4 cells infected with Alphacoronavirus suis[5]. Treatment of Vero cells with 96 μ M of Molnupiravir for 1 hour significantly reduced the viral genome copy number and viral titer of porcine epidemic diarrhea virus, and maintained the normal morphology of the cells[6].

In vivo, Molnupiravir treatment via intragastrical administration (500mg/kg) once 2 hours before MERS-CoV infection, as well as at 12 hours, 24 hours, and 48 hours after infection, can improve lung function, reduce virus titer, and alleviate weight loss in hDPP4 288/330 gene-modified mice [7]. Oral

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administration of Molnupiravir (100mg/kg) twice daily to female ferrets within 3.5 days after infection with H1N1 influenza virus significantly reduced viral load, alleviated fever, airway epithelial tissue pathological changes, and inflammation^[8].

References:

- [1] Kumar D, Trivedi N. Disease-drug and drug-drug interaction in COVID-19: Risk and assessment[J]. Biomedicine & Pharmacotherapy, 2021, 139: 111642.
- [2] Bekheit M S, Panda S S, Girgis A S. Potential RNA-dependent RNA polymerase (RdRp) inhibitors as prospective drug candidates for SARS-CoV-2[J]. European Journal of Medicinal Chemistry, 2023, 252: 115292.
- [3] Malek R J, Bill C A, Vines C M. Clinical drug therapies and biologicals currently used or in clinical trial to treat COVID-19[J]. Biomedicine & Pharmacotherapy, 2021, 144: 112276.
- [4] Li P, Wang Y, Lavrijsen M, et al. SARS-CoV-2 Omicron variant is highly sensitive to molnupiravir, nirmatrelvir, and the combination[J]. Cell research, 2022, 32(3): 322-324.
- [5] Doki T, Shinohara K, To K, et al. Molnupiravir Inhibits Replication of Multiple Alphacoronavirus suis Strains in Feline Cells[J]. Pathogens, 2025, 14(8): 787.
- [6] Huang Z X, Zhou S T, Yang Z B, et al. Molnupiravir inhibits porcine epidemic diarrhea virus infection in vitro[J]. Viruses, 2023, 15(6): 1317.
- [7] Sheahan T P, Sims A C, Zhou S, et al. An orally bioavailable broad-spectrum antiviral inhibits SARS-CoV-2 in human airway epithelial cell cultures and multiple coronaviruses in mice[J]. Science translational medicine, 2020, 12(541): eabb5883.
- [8] Toots M, Yoon J J, Cox R M, et al. Characterization of orally efficacious influenza drug with high resistance barrier in ferrets and human airway epithelia[J]. Science translational medicine, 2019, 11(515): eaax5866.

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