# Ribavirin

**Cat. No.:** HY-B0434

**CAS No.:** 36791-04-5

**Molecular Formula:** $C_8H_{12}N_4O_5$

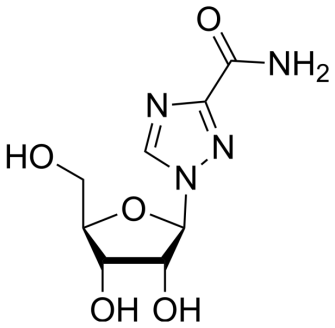
**Molecular Weight:** 244.2

**Target:** HCV; RSV; Antibiotic; Orthopoxvirus

**Pathway:** Anti-infection

**Storage:**

| | | |
|---|---|---|
| Powder | -20°C | 3 years |
| | 4°C | 2 years |
| In solvent | -80°C | 1 year |
| | -20°C | 6 months |




## SOLVENT & SOLUBILITY

**In Vitro**

$H_2O$ : 100 mg/mL (409.50 mM; Need ultrasonic)
DMSO : 100 mg/mL (409.50 mM; Need ultrasonic)

**Preparing Stock Solutions**

| Solvent / Mass / Concentration | 1 mg | 5 mg | 10 mg |
|---|---|---|---|
| 1 mM | 4.0950 mL | 20.4750 mL | 40.9500 mL |
| 5 mM | 0.8190 mL | 4.0950 mL | 8.1900 mL |
| 10 mM | 0.4095 mL | 2.0475 mL | 4.0950 mL |

Please refer to the solubility information to select the appropriate solvent.

**In Vivo**

1. Add each solvent one by one: PBS
   Solubility: 110 mg/mL (450.45 mM); Clear solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (10.24 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (10.24 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (10.24 mM); Clear solution

## BIOLOGICAL ACTIVITY

**Description**

Ribavirin (ICN-1229) is an antiviral agent against a broad spectrum of viruses including HCV, HIVl, and RSV. Ribavirin also has anti-orthopoxvirus and anti-variola activities.

**In Vitro**

Treatmentof LPS-stimulated microglia with 5, 10 and 20 μM Ribavirin (ICN-1229) induces reduction of $NO_2$ levels for 43%

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|---|---|
| | (p<0.05), 53% (p<0.05) and 59% (p<0.05), respectively. Ribavirin (ICN-1229) (10 mM) insignificantly decreases the cell surface area in non-stimulated culture, but significantly reduces cell surface area (by 32%, p<0.05) in LPS-stimulated microglia[3]. Ribavirin (ICN-1229) is active against DENV, with an $EC_{50}$ of 3 μM in A549 cells, and combination of CM-10-18 with Ribavirin (ICN-1229) demonstrates a clear enhancement in the reduction of virus replication[4].<br>MCE has not independently confirmed the accuracy of these methods. They are for reference only. |
| **In Vivo** | ALT, AST activities and bilirubin levels are significantly loared by administration of JAT in combination with interferon and Ribavirin (ICN-1229) (p<0.01). JAT, interferon or ribavirin alone with $CCl_4$, livers appear to exhibit some liver protection against $CCl_4$ as evident by the presence of normal hepatic cords, absence of necrosis and lesser fatty infiltration. Groups treated with JAT, Peg-interferon and Ribavirin (ICN-1229) separately or in combination shows reduction in the expression of TGF- β and Bax. In the group treated by triple combination of interferon, Ribavirin (ICN-1229), and JAT, the expression level of p53 is markedly reduced[1].<br>Ribavirin (ICN-1229) capsules (400 mg of ribavirin)-treated Wistar rats show a significant decrease in activin-A and significant increase in follistatin at the serum and liver levels. Ribavirin (ICN-1229) has strong antiviral activity only when ribavirin is combined with either IFN-α or Peg-IFN-α[2].<br>Ribavirin (40 mg/kg, p.o.) significantly improves the antiviral efficacy of CM-10-18 in mice. Ribavirin (ICN-1229) inhibits DENV virus infection in cultured cells, but it is ineffective in reducing viremia in monotherapy[4].<br>MCE has not independently confirmed the accuracy of these methods. They are for reference only. |

## PROTOCOL

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|---|---|
| **Cell Assay** [3] | The effect of Ribavirin (ICN-1229) on microglial cell viability is evaluated by the sulforhodamine B (SRB) chemosensitivity assay. Briefly, LPS-stimulated microglial cells are incubated for 48 h in the presence or absence of Ribavirin (ICN-1229). Afterward, the cells are fixed in 10% (w/v) trichloroacetic acid for 1 h at 4°C, rinsed in tap water and stained with 0.4% (w/v) SRB in 1% acetic acid (100 μL/well) for 30 min at room temperature (RT). The cells are then rinsed three times in 1% acetic acid to remove the unbound stain. The protein bound stain is extracted with 200 μL 10 mM Tris base (pH 10.5) per well. The optical density is read at 540 nm, with correction at 670 nm. The results are presented as percentage of the control (non-stimulated/untreated microglial cells), that is arbitrarily set to 100%.<br>MCE has not independently confirmed the accuracy of these methods. They are for reference only. |
| **Animal Administration** [4] | The in vivo efficacy experiments are largely performed, using a dengue viremia model in AG129 mouse (defective of both type I and type II interferon receptors). Each experiment contains 6 mice (7 to 8 week-old) per dosing group. The mice are challenged with DENV (serotype 2, TSV01 strain), at $5\times10^6$ pfu/mouse via i.p. injection. Imino sugars are dosed twice daily at 12 hr intervals, and ribavirin is dosed once daily, for 3 consecutive days post-infection. Blood samples are drawn 3 days post-infection for determination of plasma virus titer by plaque assay.<br>MCE has not independently confirmed the accuracy of these methods. They are for reference only. |

## CUSTOMER VALIDATION

- Nano Lett. 2023 Oct 25;23(20):9437-9444.
- BMC Med. 2020 Jul 31;18(1):204.
- Antiviral Res. 2023 Aug 21;105703.
- Antiviral Res. 2022 Jul 19;205:105384.
- Antiviral Res. 2021 Jan;185:104977.

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## REFERENCES

[1]. Robert O Baker, et al. Potential antiviral therapeutics for smallpox, monkeypox and other orthopoxvirus infections. Antiviral Res. 2003 Jan;57(1-2):13-23.

[2]. Abdel-Hamid NM, et al. Synergistic Effects of Jerusalem Artichoke in Combination with Pegylated Interferon Alfa-2a and Ribavirin Against Hepatic Fibrosis in Rats. Asian Pac J Cancer Prev. 2016;17(4):1979-85.

[3]. Refaat B, et al. The effects of pegylated interferon-α and ribavirin on liver and serum concentrations of activin-A and follistatin in normal Wistar rat: a preliminary report. BMC Res Notes. 2015 Jun 26;8:265

[4]. Savic D, et al. Ribavirin shows immunomodulatory effects on activated microglia. Immunopharmacol Immunotoxicol. 2014 Dec;36(6):433-41

[5]. Chang J, et al. Combination of α-glucosidase inhibitor and ribavirin for the treatment of dengue virus infection in vitro and in vivo. Antiviral Res. 2011 Jan;89(1):26-34



Tel: 609-228-6898 Fax: 609-228-5909 E-mail: tech@MedChemExpress.com

Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA