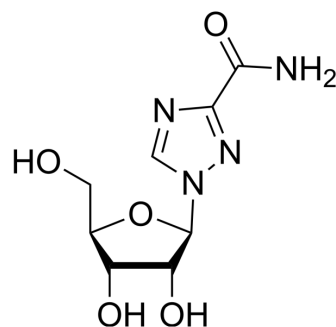


## Ribavirin (GMP)

Cat. No.:	HY-B0434G
CAS No.:	36791-04-5
Molecular Formula:	C <sub>8</sub> H <sub>12</sub> N <sub>4</sub> O <sub>5</sub>
Molecular Weight:	244.2
Target:	Antibiotic; RSV; HCV; Orthopoxvirus
Pathway:	Anti-infection
Storage:	Please store the product under the recommended conditions in the Certificate of Analysis.



### BIOLOGICAL ACTIVITY

<b>Description</b>	Ribavirin (GMP) is Ribavirin (HY-B0434) produced by using GMP guidelines. GMP small molecules work appropriately as an auxiliary reagent for cell therapy manufacture. Ribavirin (ICN-1229) is an antiviral agent against a broad spectrum of viruses including HCV, HIV1, and RSV. Ribavirin also has anti-orthopoxvirus and anti-variola activities.																
<b>In Vitro</b>	<p>Treatment of LPS-stimulated microglia with 5, 10 and 20 μM Ribavirin GMP (ICN-1229) induces reduction of NO<sub>2</sub> levels for 43% (p&lt;0.05), 53% (p&lt;0.05) and 59% (p&lt;0.05), respectively. Ribavirin GMP (ICN-1229) (10 mM) insignificantly decreases the cell surface area in non-stimulated culture, but significantly reduces cell surface area (by 32%, p&lt;0.05) in LPS-stimulated microglia<sup>[3]</sup>.</p> <p>Ribavirin GMP (ICN-1229) is active against DENV, with an EC<sub>50</sub> of 3 μM in A549 cells, and combination of CM-10-18 with Ribavirin GMP (ICN-1229) demonstrates a clear enhancement in the reduction of virus replication<sup>[4]</sup>.</p> <p>Ribavirin (20 μM, 7 d) inhibits hepatitis C virus (HCV) replication in Functional hepatocyte-like cells which developed from hiPSC<sup>[6]</sup>.</p> <p>Ribavirin (1, 10, 25 μg/ml, 72 h) attenuates ZIKV-induced cell apoptosis in hNPCs via modulation of apoptosis-regulatory genes and promotes survival signaling via the PI3K/AKT pathway<sup>[7]</sup>.</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p> <p>Real Time qPCR<sup>[7]</sup></p> <table border="1"> <tr> <td>Cell Line:</td> <td>hNPCs</td> </tr> <tr> <td>Concentration:</td> <td>1, 10, 25 μg/ml</td> </tr> <tr> <td>Incubation Time:</td> <td>72 h</td> </tr> <tr> <td>Result:</td> <td>Increased BCL2 mRNA levels and decreased BAX mRNA levels compared with DMSO control-treated cells.</td> </tr> </table> <p>Western Blot Analysis<sup>[7]</sup></p> <table border="1"> <tr> <td>Cell Line:</td> <td>hNPCs</td> </tr> <tr> <td>Concentration:</td> <td>1, 10, 25 μg/ml</td> </tr> <tr> <td>Incubation Time:</td> <td>72 h</td> </tr> <tr> <td>Result:</td> <td>Increased phosphorylation of AKT compared to control-treated ZIKV-infected cells.</td> </tr> </table>	Cell Line:	hNPCs	Concentration:	1, 10, 25 μg/ml	Incubation Time:	72 h	Result:	Increased BCL2 mRNA levels and decreased BAX mRNA levels compared with DMSO control-treated cells.	Cell Line:	hNPCs	Concentration:	1, 10, 25 μg/ml	Incubation Time:	72 h	Result:	Increased phosphorylation of AKT compared to control-treated ZIKV-infected cells.
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## In Vivo

ALT, AST activities and bilirubin levels are significantly loared by administration of JAT in combination with interferon and Ribavirin GMP (ICN-1229) ( $p < 0.01$ ). JAT, interferon or Ribavirin GMP alone with CCL<sub>4</sub>, livers appear to exhibit some liver protection against CCL<sub>4</sub> as evident by the presence of normal hepatic cords, absence of necrosis and lesser fatty infiltration. Groups treated with JAT, Peg-interferon and Ribavirin GMP (ICN-1229) separately or in combination shows reduction in the expression of TGF- $\beta$  and Bax. In the group treated by triple combination of interferon, Ribavirin GMP (ICN-1229), and JAT, the expression level of p53 is markedly reduced<sup>[1]</sup>.

Ribavirin GMP (ICN-1229) capsules (400 mg of Ribavirin GMP)-treated Wistar rats show a significant decrease in activin-A and significant increase in follistatin at the serum and liver levels. Ribavirin GMP (ICN-1229) has strong antiviral activity only when Ribavirin GMP is combined with either IFN- $\alpha$  or Peg-IFN- $\alpha$ <sup>[2]</sup>.

Ribavirin GMP (40 mg/kg, p.o.) significantly improves the antiviral efficacy of CM-10-18 in mice. Ribavirin GMP (ICN-1229) inhibits DENV virus infection in cultured cells, but it is ineffective in reducing viremia in monotherapy<sup>[4]</sup>.

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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- [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- $\alpha$  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  $\alpha$ -glucosidase inhibitor and ribavirin for the treatment of dengue virus infection in vitro and in vivo. Antiviral Res. 2011 Jan;89(1):26-34
- [6]. Sa-Ngiamsumtonn K, et al. A robust model of natural hepatitis C infection using hepatocyte-like cells derived from human induced pluripotent stem cells as a long-term host. Virol J. 2016 Apr 5;13:59.
- [7]. Kim JA, Seong RK, Kumar M, Shin OS. Favipiravir and Ribavirin Inhibit Replication of Asian and African Strains of Zika Virus in Different Cell Models. Viruses. 2018 Feb 9;10(2):72.

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

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