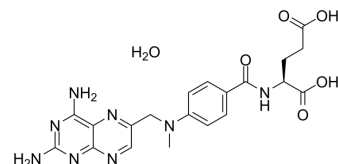


## Methotrexate monohydrate

<b>Cat. No.:</b>	HY-14519D
<b>CAS No.:</b>	6745-93-3
<b>Molecular Formula:</b>	C <sub>20</sub> H <sub>24</sub> N <sub>8</sub> O <sub>6</sub>
<b>Molecular Weight:</b>	472.45
<b>Target:</b>	Antifolate; DNA/RNA Synthesis; ADC Cytotoxin; Apoptosis; Bacterial
<b>Pathway:</b>	Cell Cycle/DNA Damage; Antibody-drug Conjugate/ADC Related; Apoptosis; Anti-infection
<b>Storage:</b>	Please store the product under the recommended conditions in the Certificate of Analysis.



### BIOLOGICAL ACTIVITY

<b>Description</b>	Methotrexate (Amethopterin) monohydrate, an antimetabolite and antifolate agent, inhibits the enzyme dihydrofolate reductase, thereby preventing the conversion of folic acid into tetrahydrofolate, and inhibiting DNA synthesis. Methotrexate monohydrate, also an immunosuppressant and antineoplastic agent, is used for the research of rheumatoid arthritis and a number of different cancers (such as acute lymphoblastic leukemia) <sup>[1][2][3]</sup> .
<b>IC<sub>50</sub> &amp; Target</b>	Traditional Cytotoxic Agents
<b>In Vivo</b>	<p>Methotrexate (Amethopterin) monohydrate reduces thymus and spleen indices of mice. Methotrexate monohydrate markedly decreases white blood cells, thymic and splenic lymphocytes at dose <math>\geq 5</math> mg/kg. However, there is a significant difference between the treatment plus control group and the model group (<math>p &lt; 0.01</math>). The combination of grape seed proanthocyanidins and Siberian ginseng eleutherosides obviously diminishes the effects of Methotrexate monohydrate exposure on indices of thymus and spleens in mice<sup>[2]</sup>.</p> <p>Methotrexate (MTX) monohydrate (2 mg/kg; i.p.; once in a week for 5 weeks) is effective in Freund's complete adjuvant-induced arthritis. The combination of Methotrexate monohydrate (1 mg/kg; i.p.; once in a week for 5 weeks) and Curcumin (30 mg/kg and 100 mg/kg, thrice a week for 5 weeks; i.p.) shows a significant anti-arthritic action and protection from hematological toxicity<sup>[4]</sup>.</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p>

### CUSTOMER VALIDATION

- J Clin Invest. 2023 May 30;e169993.
- Small. 2022 Jul;18(30):e2202337.
- EMBO Mol Med. 2022 Feb 17;e14552.
- Cell Death Dis. 2020 Nov 12;11(11):976.
- J Pharm Anal. 7 August 2022.

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## REFERENCES

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- [1]. Tian H, et al. Understanding the mechanisms of action of methotrexate: implications for the treatment of rheumatoid arthritis. Bull NYU Hosp Jt Dis. 2007;65(3):168-73.
- [2]. Swierkot J, et al. Methotrexate in rheumatoid arthritis. Pharmacol Rep. 2006 Jul-Aug;58(4):473-92.
- [3]. Ehab Tousson, et al. The Effect of L-carnitine on Amethopterin-induced Toxicity in Rat Large Intestine.
- [4]. Banji D, et al. Evaluation of the concomitant use of methotrexate and curcumin on Freund's complete adjuvant-induced arthritis and hematological indices in rats. Indian J Pharmacol. 2011;43(5):546-550.
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**Caution: Product has not been fully validated for medical applications. For research use only.**

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