# Ruthenium red

**Cat. No.:** HY-103311

**CAS No.:** 11103-72-3

**Molecular Formula:** $Cl_6H_{42}N_{14}O_2Ru_3$

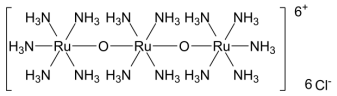
**Molecular Weight:** 786.35

**Target:** Calcium Channel

**Pathway:** Membrane Transporter/Ion Channel; Neuronal Signaling

**Storage:** 4°C, protect from light

* In solvent : -80°C, 6 months; -20°C, 1 month (protect from light)



## SOLVENT & SOLUBILITY

**In Vitro**

$H_2O$ : 10 mg/mL (12.72 mM; ultrasonic and warming and heat to 60°C)

| Preparing Stock Solutions | Mass / Solvent / Concentration | 1 mg | 5 mg | 10 mg |
|---|---|---|---|---|
| | 1 mM | 1.2717 mL | 6.3585 mL | 12.7170 mL |
| | 5 mM | 0.2543 mL | 1.2717 mL | 2.5434 mL |
| | 10 mM | 0.1272 mL | 0.6358 mL | 1.2717 mL |

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

## BIOLOGICAL ACTIVITY

**Description**

Ruthenium red (Ammoniated ruthenium oxychloride) is a polycationic dye widely used for electron microscopy (EM) of cells, tissues and vegetative bacteria. Ruthenium red strongly reacts with phospholipids and fatty acids and binds to acidic mucopolysaccharides. Ruthenium red is a L-type calcium current ($I_{Ca}$) blocker[1][2].

**$IC_{50}$ & Target**

L-type calcium channel

**In Vitro**

Ruthenium red staining of intracellular organelles and structures seemed to depend on the time of exposure to this agent, as well on the concentration used[2].

Ruthenium red efficiently blocks the L-type calcium current in a dose-dependent manner in in guinea-pig isolated ventricular heart cells, with $EC_{50}$ of 0.8 μM[2].

Ruthenium red (10 μM) blocks the sarcoplasmic $Ca^{2+}$ release channels or the mitochondrial $Ca^{2+}$ uptake, and blocks 26.7 % of the sodium current, and slows its inactivation time-course in guinea-pig isolated ventricular heart cells[2].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

## CUSTOMER VALIDATION

- Free Radic Biol Med. 2023 Jun 1;S0891-5849(23)00437-9.
- Front Pharmacol. 2022 May 17;13:855626.
- Biomed Res Int. 2021 May 15.

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## REFERENCES

[1]. Lashanda N Waller, et al. Ruthenium red staining for ultrastructural visualization of a glycoprotein layer surrounding the spore of Bacillus anthracis and Bacillus subtilis. J Microbiol Methods. 2004 Jul;58(1):23-30.

[2]. Claire O Malécot, et al. Ruthenium red as an effective blocker of calcium and sodium currents in guinea-pig isolated ventricular heart cells. Br J Pharmacol. 1998 Jun; 124(3): 465-472.



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