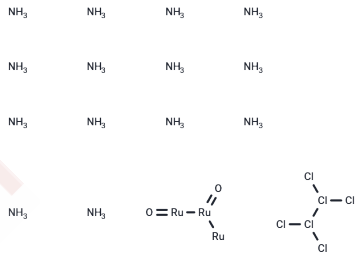
Data Sheet (Cat.No.T23280)

TargetMol

Ruthenium Red

Chemical Properties



CAS No. : 11103-72-3

Formula: Cl6H42N14O2Ru3

Molecular Weight: 786.34

Storage: Keep away from direct sunlight,Store under nitrogen
Powder: -20°C for 3 years | In solvent: -80°C for 1 year
Actual storage temperature shall be subject to the COA.

Biological Description

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 (ICa) blocker, blocks Ca2+ uptake and release, and voltage-sensitive Ca2+ channels
Targets(IC50)	Calcium Channel
Cell Research	1. Solution preparation 1. Mother solution preparation: Dissolve Ruthenium Red in an appropriate solvent, DMSO or H2O, usually at a concentration of 1-10 mM. 2. Working solution preparation: Dilute Ruthenium Red into the required working solution using PBS/DMEM/H2O, usually at a concentration range of 1-10μM, which needs to be adjusted according to the experimental situation. 1. As a calcium current blocker 1. Cell treatment: Add Ruthenium Red working solution to the cell culture medium and incubate at different time points to observe the inhibitory effect of L-type calcium channels. 2. Calcium ion monitoring: Use calcium indicators (such as Fura-2, Fluo-4, etc.) combined with fluorescence microscopy or flow cytometry to monitor changes in intracellular calcium ion concentration. 2. For electron microscopy observation 1. Sample staining: Add Ruthenium Red working solution to cells or tissue samples, stain for a certain period of time, remove and wash with PBS. 2. Microscopic observation: Observe the sample using an electron microscope or fluorescence microscope to check the staining effect. III. Cell membrane and tissue staining: 1. Solution preparation: Dilute the Ruthenium Red stock solution in PBS or other suitable buffer, and the concentration can be adjusted to 10-50 μM. 2. Cell or tissue staining: Add the dye solution to the cell culture medium, incubate for 15-30 minutes, and then observe the labeled cell structure by fluorescence microscopy. The above information is based on published literature. Experimental procedures should be appropriately modified to meet specific research demands.

Solubility Information

Solubility	H2O: 20 mg/mL (25.43 mM),Sonication is recommended. DMSO: 20 mg/mL (25.43 mM),Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	1.2717 mL	6.3586 mL	12.7171 mL
5 mM	0.2543 mL	1.2717 mL	2.5434 mL
10 mM	0.1272 mL	0.6359 mL	1.2717 mL
50 mM	0.0254 mL	0.1272 mL	0.2543 mL

Please select the appropriate solvent to prepare the stock solution, according to the solubility of the product in different solvents. Please use it as soon as possible.

Note: The dilution table applies only to solid products. For liquid products, please calculate the stock solution based on the stated concentration and/or density.

Reference

Nagy-Watson NV, Jonz MG. Hypoxia increases intracellular calcium in glutamate-activated horizontal cells of goldfish retina via mitochondrial KATP channels and intracellular stores. Comp Biochem Physiol A Mol Integr Physiol. 2025 Feb;300:111786.

Zheng Q, Zou Y, Teng P, et al. Mechanosensitive Channel PIEZO1 Senses Shear Force to Induce KLF2/4 Expression via CaMKII/MEKK3/ERK5 Axis in Endothelial Cells. Cells. 2022, 11(14): 2191

Mamet T, et al. Yak milk inhibits osteoclast differentiation by suppressing TRPV5 expression. J Dairy Sci. 2025 Jan 15:S0022-0302(25)00007-4.

Rodrigues da Silva RE,et al. Biphasic effect of limonene on contraction of isolated rat aorta. Chem Biol Interact. 2025 Jan 5;405:111313.