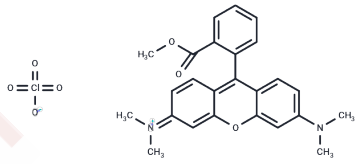
Data Sheet (Cat.No.T17109)

TargetMol

TMRM Perchlorate

Chemical Properties



CAS No. : 115532-50-8

Formula: C25H25ClN2O7

Molecular Weight: 500.93

Storage: Keep away from direct sunlight
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	TMRM Perchlorate (T668) is a cell-permeant cationic lipophilic red fluorescent dye (λex=530 nm, λem=592 nm).
Targets(IC50)	Others
In vitro	TMRM Perchlorate is a fluorescent probe (excitation, 530±21 nm; emission, 592±22 nm). The fluorescence signal in the presence of TMRM Perchlorate shows a slight decrease after the addition of glutamate, indicative of increased polarization of the mitochondrial inner membrane. In the presence of TMRM Perchlorate (2 μM) the coupled respiration with Complex I substrates or upon the addition of Complex II substrate is decreased by 27%[1]. Exposure of hippocampal cultures to low concentrations of TMRM Perchlorate (50 to 500 nM) for 1 to 3 hours results in selective staining of mitochondria in both neurons and the underlying glial cells. Exposure of hippocampal cultures to high concentrations of TMRM Perchlorate (1 to 25 μM) stains mitochondria selectively and quickly, reaching a plateau after 5 to 10 min. Low concentrations of TMRM Perchlorate (50 to 200 nM) do not induce apoptosis, whereas higher concentrations (0.5 and 2.5 μM) enhance apoptosis (KD?=?500 nM)[2].
Cell Research	1. Mitochondrial membrane potential measurement Experimental steps: 1. Prepare TMRM solution: Dissolve TMRM Perchlorate (T668) in DMSO to prepare a stock solution (usually 1 mM). The stock solution is then diluted to a working concentration, usually between 10 nM and 200 nM, depending on the experimental requirements. 2. Cell incubation: Add TMRM solution to the cells and incubate at 37°C for 20-30 minutes. During this time, the dye enters the cells and accumulates in the mitochondria, and the dye emits a red fluorescence. 3. Wash (optional): After incubation, wash the cells with fresh culture medium or PBS to remove excess dye. 4. Fluorescence measurement: Fluorescence measurement is performed using a fluorescence microscope or flow cytometry, with the excitation wavelength of 530 nm and the emission wavelength of 592 nm. The fluorescence intensity reflects the mitochondrial membrane potential. 5. Data analysis: High fluorescence intensity indicates a higher mitochondrial membrane potential, while a decrease in fluorescence intensity indicates a loss of mitochondrial membrane potential.

Cell Research	2. Research on apoptosis and mitochondrial dysfunction Experimental steps: 1. Treat cells: Treat cells with apoptosis inducers, mitochondrial uncoupling agents, or other chemicals that may affect mitochondrial membrane potential. 2. Add TMRM solution: Add TMRM dye to the treated cells and incubate for 20-30 minutes. 3. Fluorescence measurement: Measure the fluorescence intensity according to the above method. A decrease in fluorescence intensity indicates a decrease in mitochondrial membrane potential, which may indicate that the cells are undergoing apoptosis or stress. 4. Results analysis: Analyze the changes in fluorescence intensity. If the fluorescence intensity is significantly reduced, it indicates a loss of mitochondrial membrane potential, which is one of the hallmarks of apoptosis. Notes: 1. Concentration optimization: The optimal working concentration of TMRM may vary by cell type. It is recommended to determine the optimal concentration through experiments. 2. Live cell staining: TMRM is used for live cell staining. The cells need to be gently treated during operation to avoid destroying the mitochondrial structure during the washing step. 3. Avoid photobleaching: TMRM is sensitive to photobleaching. Light exposure should be minimized during sample processing and imaging to ensure reliable results. 4. Control experiments: Appropriate controls should be included in the experiment, such as treating cells with mitochondrial uncoupling agents (such as FCCP), which can serve as a positive control for loss of mitochondrial membrane potential. The above information is based on published literature. Experimental procedures should be appropriately modified to meet specific research demands.

Solubility Information

Solubility	DMSO: 50 mg/mL (99.81 mM),Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)
In vivo Formulation	10% DMSO+90% Saline: < 5 mg/mL (9.98 mM),Lower concentrations may be soluble, but exact solubility limit is unknown. 10% DMSO+40% PEG300+5% Tween 80+45% Saline: 5 mg/mL (9.98 mM),Suspension. *Please add the solvents sequentially, clarifying the solution as much as possible before adding the next one. Dissolve by heating and/or sonication if necessary. Working solution is recommended to be prepared and used immediately. The formulation provided above is for reference purposes only. In vivo formulations may vary and should be modified based on specific experimental conditions.*

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	1.9963 mL	9.9814 mL	19.9629 mL
5 mM	0.3993 mL	1.9963 mL	3.9926 mL
10 mM	0.1996 mL	0.9981 mL	1.9963 mL
50 mM	0.0399 mL	0.1996 mL	0.3993 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

Lounas A,et al. A 3D analysis revealed complexe mitochondria morphologies in porcine cumulus cells. Sci Rep. 2022 Sep 13;12(1):15403.
Valdebenito GE, Duchen MR. Monitoring Mitochondrial Membrane Potential in Live Cells Using Time-Lapse Fluorescence Imaging. Methods Mol Biol. 2022;2497:319-324.
Lan W,et al. Sulfiredoxin-1 protects spinal cord neurons against oxidative stress in the oxygen-glucose deprivation/reoxygenation model through the bax/cytochrome c/caspase 3 apoptosis pathway. Neurosci Lett. 2021 Jan 23;744:135615.