TMRE-Mitochondrial Membrane Potential Assay Kit

**Product name**
TMRE-Mitochondrial Membrane Potential Assay Kit

**Detection method**
Fluorescent

**Assay type**
Cell-based (qualitative)

**Overview**
TMRE-Mitochondrial Membrane Potential Assay Kit (ab113852) is suitable for quantifying changes in mitochondrial membrane potential in live cells by flow cytometry, microplate spectrophotometry and fluorescent microscopy. Each assay kit contains sufficient materials for at least 200 measurements.

ab113852 uses TMRE (tetramethylrhodamine, ethyl ester) to label active mitochondria. TMRE is a cell permeant, positively-charged, red-orange dye that readily accumulates in active mitochondria due to their relative negative charge. Depolarized or inactive mitochondria have decreased membrane potential and fail to sequester TMRE.

FCCP (carbonyl cyanide 4-(trifluoromethoxy) phenylhydrazone) is a ionophore uncoupler of oxidative phosphorylation. Treating cells with FCCP eliminates mitochondrial membrane potential and TMRE staining. TMRE is suitable for the labeling of mitochondria in live cells and is not compatible with fixation.

Review our [cell health assays guide](#) to learn more about our other cell viability, cytotoxicity and cell proliferation assay kits.

**Tested applications**
**Suitable for:** Functional Studies

**Platform**
Reagents

**Properties**

**Storage instructions**
Store at +4°C. Please refer to protocols.

**Components**

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<th>Component</th>
<th>Quantity</th>
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<tr>
<td>1mM TMRE (in DMSO)</td>
<td>1 x 40µl</td>
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Relevance

Mitochondrial Membrane Potential is an important parameter of mitochondrial function used as an indicator of cell death. The collapse of the mitochondrial Membrane potential coincides with the opening of the mitochondrial permeability transition pores, leading to the release of cytochrome c into the cytosol, which in turn triggers other downstream events in the apoptotic cascade.

Applications

Our Abpromise guarantee covers the use of ab113852 in the following tested applications.

The application notes include recommended starting dilutions; optimal dilutions/concentrations should be determined by the end user.

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<td>Functional Studies</td>
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<td>Use at an assay dependent concentration.</td>
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Images

Mitochondrial membrane potential was measured using ab113852

Popova D et al., PloS One, 11(11), Fig 5. doi: 10.1371/journal.pone.0166750

P19 neurons (750 cells/mm²) were exposed to MDMA on days 7–9 in serum-free medium for 10 min up to 48 hours. The positive control FCCP (carbonyl cyanide-p-trifluoromethoxyphenylhydrazone), an uncoupler of mitochondrial oxidative phosphorylation, was applied at the concentration of 5 μM for 10 min. The cells were incubated with 500 μM TMRE for 30–45 min at 37°C, 5% CO₂, followed by washing once with 100 μl of HBSS containing 0.2% bovine serum albumin. A volume of 200 μl of HBSS containing 0.2% bovine serum albumin was added to each well, and the fluorescence was measured with excitation/emission: 544/590 nm.
A: HeLa cells (adherent) were cultured on coverslips and stained with ab113852 (200nM TMRE) for 20 minutes in media, washed briefly with PBS and immediately imaged. B: Jurkat cells (suspension) were stained and washed as above and then transferred to a slide and immobilized under a coverslip for imaging.

Chart showing mean fluorescent intensity +/- standard deviation from quadruplicate measurements of 400 nM TMRE stained Jurkat cells in a 96-well microplate +/- treatment with FCCP.

Flow cytometry histogram of Jurkat cells stained with ab113852 (100nM TMRE) with (blue) or without (red) treatment with 100µM FCCP.

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