OxiVision™ Red Lipid Peroxidation Sensor

Catalog number: 21512
Unit size: 1 mg

Component	Storage	Amount (Cat No. 21512)
OxiVision™ Red Lipid Peroxidation Sensor	Freeze (< -15 °C), Minimize light exposure	1 mg

OVERVIEW

The OxiVision™ Red Lipid Peroxide Sensor is a perylene-based fluorescent probe functionalized with oligooxyethylene for the selective detection of lipid peroxides. Upon oxidation by lipid peroxides, the sensor emits intense fluorescence in organic solvents such as ethanol. Unlike conventional ROS probes, OxiVision™ Red demonstrates a high degree of selectivity for lipid peroxides, enabling precise monitoring of lipid peroxidation dynamics.

The oxidized form of the probe exhibits excitation and emission maxima at 650 nm and 670 nm, respectively, optimizing detection by reducing phototoxicity and minimizing autofluorescence in biological samples. The addition of a tetraethyleneglycol moiety on the diisoquinoline ring improves solubility and dispersibility in aqueous environments, enhancing probe stability and usability in biological assays. Notably, the oxidized probe exhibits negligible fluorescence in aqueous media but displays a pronounced increase in fluorescence intensity in lipophilic environments, such as cellular membranes.

This fluorescence shift enables quantitative assessment of lipid peroxides in live-cell systems using flow cytometry and facilitates high-resolution imaging of lipid peroxidation via fluorescence microscopy. The probe provides a robust tool for investigating oxidative lipid modifications, particularly in studies related to ferroptosis and lipid peroxidation-mediated cell death pathways.

AT A GLANCE

Important

Before using for the first time, allow the OxiVision™ Red Lipid Peroxidation Sensor to reach room temperature, then briefly centrifuge to gather the dried pellet.

Protocol Summary

1. Prepare the cells in a growth medium and treat the cells as desired.
2. Stain the cells with the OxiVision™ Red Lipid Peroxidation Sensor working solution.
3. Remove the working solution, then treat the cells to induce lipid peroxidation.
4. Monitor fluorescence intensity using a fluorescence microscope with a Cy5 filter.

KEY PARAMETERS

Fluorescence microscope

Emission	Cy5 Filter Set
Excitation	Cy5 Filter Set
Recommended plate	Black wall/clear bottom

PREPARATION OF STOCK SOLUTIONS

Unless otherwise noted, all unused stock solutions should be divided into single-use aliquots and stored at -20 °C after preparation. Avoid repeated freeze-thaw cycles

OxiVision™ Red Lipid Peroxidation Sensor Stock Solution

1. Prepare a 1–5 mM stock solution by dissolving the OxiVision™ Red Lipid Peroxidation Sensor in DMSO. For example, add 975 µL of DMSO to the vial to prepare a 1 mM stock solution.

   Note: Aliquot any unused stock solution into single-use aliquots and store at ≤ -20°C. Protect from light and minimize freeze-thaw cycles to maintain stability.

PREPARATION OF WORKING SOLUTION

OxiVision™ Red Lipid Peroxidation Sensor Working Solution

1. To prepare a 5–10 µM working solution of OxiVision™ Red Lipid Peroxidation Sensor, dilute the stock solution in 20 mM HEPES buffer. For example, to prepare a 10 µM working solution, add 100 µL of a 1 mM OxiVision™ Red Lipid Peroxidation Sensor stock solution to 10 mL of 20 mM HEPES buffer. Mix thoroughly before use.

   Note: Protect the working solution from light by covering it with aluminum foil or storing it in a dark environment.

   Note: For optimal performance, use the working solution within two hours of preparation.

   Note: Use a salt-free buffer, such as 20 mM HEPES buffer, to prevent precipitation. Buffers containing salts may lead to unwanted aggregation.a

SAMPLE EXPERIMENTAL PROTOCOL

1. Plate the cells as desired in a 96-well black wall-clear bottom plate.
2. Remove the cell culture medium and wash the cells with HHBS buffer.
3. Add 100 µL of the OxiVision™ Red Lipid Peroxidation Sensor working solution to the cells.
4. Incubate the cells at 37°C in a 5% CO_2 incubator for 30 to 60 minutes, ensuring they are protected from light.

   Note: The optimal concentration and incubation time of OxiVision™ Red Lipid Peroxidation Sensor may vary depending on the cell line. It is recommended to test different concentrations to determine the most effective conditions.

5. Remove the dye solution and wash the cells twice with HHBS buffer.

6. Add treatment to induce lipid peroxidation.

7. Add HHBS buffer and examine the cells using a fluorescence microscope equipped with a Cy5 filter set.

EXAMPLE DATA ANALYSIS AND FIGURES

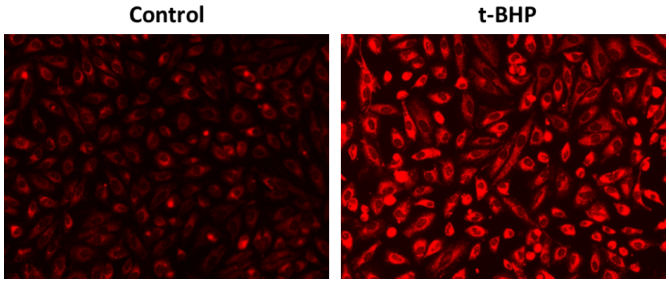

Figure 1. Fluorescence response of OxiVision™ Red Lipid Peroxide Sensor (10 μM) in HeLa cells following treatment with or without 250 μM t-BHP at 37°C for 60 minutes. Fluorescence intensities were analyzed using fluorescence microscopy with a Cy5 filter.

DISCLAIMER

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