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# BODIPY™ 581/591 C11 (Lipid Peroxidation Sensor)

| Catalog Number | Packaging Size |
|---|---|
| C258 | 1 mg |

**Storage upon receipt:** -20°C, protected from light

## Introduction

BODIPY™ 581/591 C11 (Lipid Peroxidation Sensor) is a sensitive fluorescent probe for lipid peroxidation assays that localizes to membranes in live cells. Oxidation of the polyunsaturated butadienyl portion of this fatty acid analog in live cells results in a shift of the fluorescence emission peak from red (590 nm) to green (510 nm), allowing ratiometric analysis of lipid peroxidation using fluorescence microscopy, high-content analysis, and flow cytometry. In the reduced state, the excitation and emission maxima of BODIPY 581/591 C11 is 581/591 nm; after oxidation, the probe shifts the excitation and emission to 488/510 nm.

Lipid peroxidation is the oxidative degradation of cellular lipids by free radicals from reactive oxygen species, which can degrade lipids containing carbon-carbon double bonds such as phospholipids and polyunsaturated fatty acids. Oxidation of lipids leads to the generation of lipid peroxides and can cause damage to cell membranes, resulting in changes to signal transduction pathways and eventually leading to cell death. Lipid peroxidation is involved in apoptosis and one of the main contributors to ferroptosis, an iron-dependent, non-apoptotic form of cell death. Oxidative stress from lipid peroxidation plays a role in aging, as well as pathologies such as cancer, atherosclerosis, and neurodegenerative diseases.

The BODIPY 581/591 C11 reagent provides a sensitive method to measure lipid peroxidation that occurs in these biological processes and pathological conditions. Because it shifts its fluorescence emission upon oxidation and can be measured through ratiometric fluorescence analysis at two wavelengths, measurement with the BODIPY 581/591 C11 reagent can minimize variations in fluorescence intensity due to factors such as indicator concentration, excitation intensity, and photobleaching. The BODIPY 581/591 C11 reagent can also be used for fluorometric lipid peroxidation assays of antioxidant efficacy in plasma and lipid vesicles.

## Prepare BODIPY™ 581/591 C11 reagent stock solution

- Make a 10 mM stock solution of BODIPY™ 581/591 C11 reagent by dissolving the contents of the vial in 187 µL of anhydrous DMSO.

## Prepare positive control (optional)

- Make a 100 mM stock solution of cumene hydroperoxide in ethanol. Add cumene hydroperoxide to the cells at a final concentration of 100 µM and incubate at 37°C for 2 hours.

## Labeling and detection

1. Plate cells at a desired density and incubate them overnight at 37°C.
2. Treat the cells with the compound of interest and incubate for the recommended time.

3. Add BODIPY™ 581/591 C11 reagent at a final concentration of 10 μM to the cells. Then incubate for another 30 minutes at 37°C.
4. Remove media and wash cells three times with PBS.
5. Read the fluorescence at to separate wavelengths; one at excitation/emission of 581/591 nm (Texas Red® filter set) for the reduced dye, and the other at excitation/emission of 488/510 nm (traditional FITC filter set) for the oxidized dye.
6. The ratio of the emission fluorescence intensities at 590 nm to 510 nm gives the read-out for lipid peroxidation in cells.