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MitoCLox, mitochondrial lipid peroxidation probe

http://www.lumiprobe.com/p/mitoclox-lipid-peroxidation-probe

During the ferroptosis and mitochondrial stage of apoptosis, a mitochondria-specific phospholipid, cardiolipin (CL), undergoes peroxidation. MitoCLox is a mitochondria-targeted fluorescence probe that allows monitoring of this process in vivo.

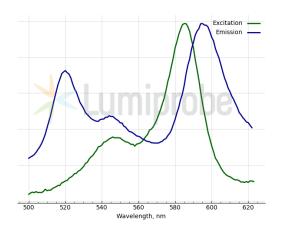
MitoCLox consists of the BDP 581/591 fluorophore carrying a diene-containing moiety (C11) and linked with a triphenylphosphonium (TPP) residue via a long flexible linker with two amide bonds. MitoCLox is similar to MitoPerOx but has a longer linker and contains two (vs. one in MitoPerOx) peptide bonds. The flexible linker of MitoCLox mimics the SS-20 peptide (Phe-D-Arg-Phe-Lys-NH2), making the indicator specific for cardiolipin. The linker also increases the cellular permeability of MitoCLox due to additional positive charges.

The oxidation of the diene in MitoCLox results in a substantial increase in the fluorescence emission at 520 nm and a decrease in the initial fluorescence at 590 nm of the BDP 581/591 fluorophore. Thus, the oxidation of MitoCLox could be measured either as a decrease of absorbance at 588 nm or as an increase of fluorescence emission in the ratiometric mode at 520/590 nm [1].

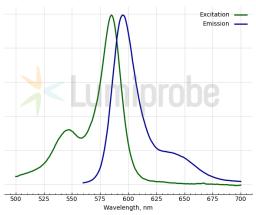
MitoCLox is accumulated in the mitochondria of living cells. Maximal accumulation of MitoCLox in the cells is reached in 45-60 min. After removing MitoCLox from the medium, the fluorescence of the cells slowly decreased and reached 50% of the maximum in approximately 1 h. The recommended working concentration of MitoCLox is 100-200 nM [2].

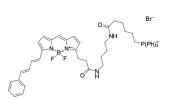
[1] Lyamzaev K.G. et al. MitoCLox: A Novel Mitochondria-Targeted Fluorescent Probe for Tracing Lipid Peroxidation. Oxid. Med. Cell Longev. 2019:9710208.

[2] Lyamzaev K.G. et al. Novel Fluorescent Mitochondria-Targeted Probe MitoCLox Reports Lipid Peroxidation in Response to Oxidative Stress *In Vivo*. Oxid. Med. Cell Longev. 2020:3631272.



Absorption and emission spectra of MitoCLox in oxidized form





General properties

Appearance: black powder

Molecular weight: 901.69

 $\label{eq:condition} \begin{array}{ll} \mbox{Molecular formula:} & C_{50}\mbox{H}_{53}\mbox{BBrF}_2\mbox{N}_4\mbox{O}_2\mbox{P} \\ \mbox{Solubility:} & \mbox{good in DMSO} \end{array}$

Quality control: NMR ¹H and HPLC-MS (95+%)

Storage conditions: 24 months after receival at -20°C in the dark. Transportation: at room temperature

for up to 3 weeks. Desiccate.

Spectral properties

Excitation/absorption maximum, nm: 585 $\epsilon, \ L \cdot mol^{-1} \cdot cm^{-1} \colon 138500$ Emission maximum, nm: 595