

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*.

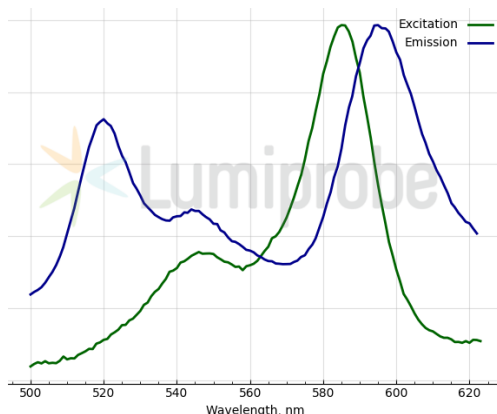
MitoCLOx consists of the BDP 581/591 fluorophore carrying a diene-containing moiety (C11) and linked with a triphenylphosphonium (TPP) residue via a long flexible linker with two amide bonds. MitoCLOx is similar to MitoPerOx but has a longer linker and contains two (vs. one in MitoPerOx) peptide bonds. 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].

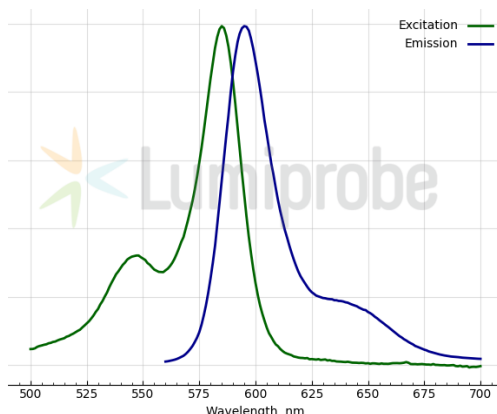
MitoCLOx is accumulated in the mitochondria of living cells. Maximal accumulation of MitoCLOx in the cells is reached in 45-60 min. After removing MitoCLOx from the medium, the fluorescence of the cells slowly decreased and reached 50% of the maximum in approximately 1 h. The recommended working concentration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

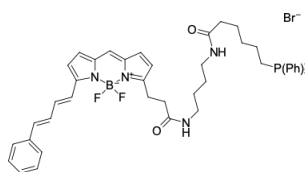
[2] Lyamzaev K.G. et al. Novel Fluorescent Mitochondria-Targeted Probe MitoCLOx Reports Lipid Peroxidation in Response to Oxidative Stress *In Vivo*. *Oxid. Med. Cell Longev.* 2020:3631272.



Absorption and emission spectra of MitoCLOx in oxidized form



Absorption and emission spectra of MitoCLOx



Structure of MitoCLOx

General properties

Appearance:	black powder
Molecular weight:	901.69
Molecular formula:	$\text{C}_{50}\text{H}_{53}\text{BBrF}_2\text{N}_4\text{O}_2\text{P}$
Solubility:	good in DMSO
Quality control:	NMR ^1H and HPLC-MS (95+%)
Storage conditions:	24 months after receipt at -20°C in the dark. Transportation: at room temperature for up to 3 weeks. Desiccate.

Spectral properties

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