

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*.

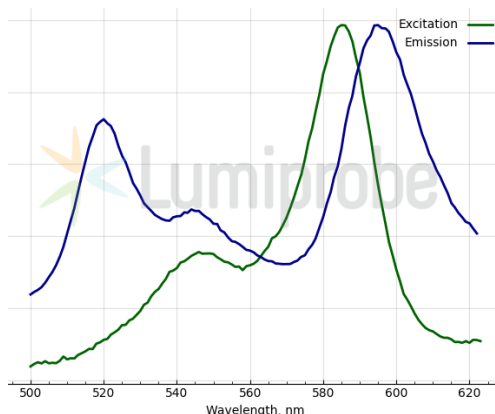
MitoCLOx consists of the BDP 581/591 fluorophore carrying a diene-containing moiety (C11) and linked with a triphenylphosphonium (TPP) residue via a long flexible linker with two amide bonds. MitoCLOx is similar to MitoPerOx but has a longer linker and contains two (vs. one in MitoPerOx) peptide bonds.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

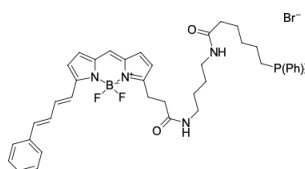
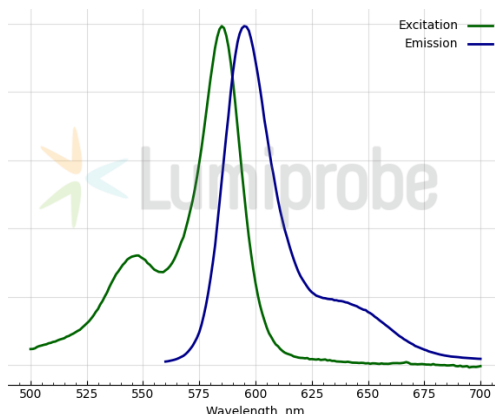
MitoCLOx is accumulated in the mitochondria of living cells. Maximal accumulation of MitoCLOx in the cells is reached in 45-60 min. After removing MitoCLOx from the medium, the fluorescence of the cells slowly decreased and reached 50% of the maximum in approximately 1 h. The recommended working concentration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



Structure of MitoCLOx

Absorption and emission spectra of MitoCLOx

General properties

Appearance:	black powder
Molecular weight:	901.69
Molecular formula:	$C_{50}H_{53}BBBrF_2N_4O_2P$
Solubility:	good in DMSO
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.
Legal statement:	This Product is offered and sold for research purposes only. It has not been tested for safety and efficacy in food, drug, medical device, cosmetic, commercial or any other use. Supply does not express or imply authorization to use for any other purpose, including, without limitation, in vitro diagnostic purposes, in the manufacture of food or pharmaceutical products, in medical devices or in cosmetic products.

Spectral properties

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