

Mitochondrial Research



Proliferation
Cytotoxicity
Senescence
Autophagy
Oxidative Stress
Metabolism
Mitochondria
Lysosome
Endocytosis
Other Organelles
Exosome, Lipid Droplet, etc.

Mitochondrial Superoxide Detection
mitSOX Deep Red - Mitochondrial Superoxide Detection

Allow to detecting mitochondrial superoxide with a long wavelength (Deep Red)

Ferrous Ion Detection
Mito-FerroGreen

Live-cell fluorescent imaging of intracellular Fe²⁺

Mitophagy Detection
Mitophagy Detection Kit

Live-cell fluorescent imaging of mitophagy without transfection

Measurement of Glucose
Glucose Assay Kit-WST

Measurement of intracellular glucose concentrations via fluorescence

Measurement of Lactate
Lactate Assay Kit-WST

Measuring lactate to infer glycolytic activity

Singlet Oxygen Detection
Si-DMA for Mitochondrial Singlet Oxygen Imaging

Real-time visualization of ¹O₂ generation

Lipophilic Peroxide Detection
MitoPeDPP

Live-cell fluorescent imaging of lipophilic peroxide

Mitochondria Fluorescent Probe for Immunostaining
MitoBright IM Red for Immunostaining

Capable of co-stained with immunostaining. Higher retention in mitochondria after fixation & membrane permeabilization

Membrane Potential Detection
MT-1 MitoMP Detection Kit

Monitoring and observation even after fixation, with more sensitive detection than JC-1

Total ROS Detection
ROS Assay Kit -Highly Sensitive DCFH-DA-

Detection with higher sensitivity than the original DCFH-DA

Measurement of Lactate
Extracellular OCR Plate Assay Kit

Applicable to regular fluorescent plate reader with temperature-controlled incubation

Mitochondrial Staining MitoBright LT Series (Green / Red / DeepRed)

Selective staining of mitochondria in living cells

Membrane Potential Detection
JC-1 MitoMP Detection Kit

Analysis of mitochondrial membrane potential through fluorescence color ratios via microscopy, FCM, or microplate reader

Description	Unit	Code	
Metabolism			Proliferation Cytotoxicity
Extracellular OCR Plate Assay Kit	100 tests	E297-10	
Glucose Assay Kit-WST	50 tests	G264-05	Senescence
	200 tests	G264-20	
Lactate Assay Kit-WST	50 tests	L256-10	Autophagy
	200 tests	L256-20	
Mitochondrial Membrane Potential			Oxidative Stress
MT-1 MitoMP Detection Kit	1 set	MT13-10	
JC-1 MitoMP Detection Kit	1 set	MT09-10	
Mitophagy			Metabolism
Mitophagy Detection Kit	1 set	MD01-10	
Mtphagy Dye	5 $\mu\text{g} \times 3$	MT02-10	
Mitochondrial Staining			Mitochondria
MitoBright LT Green	400 μl	MT10-12	
MitoBright LT Red	400 μl	MT11-12	Lysosome
MitoBright LT Deep Red	400 μl	MT12-12	
MitoBright IM Red for Immunostaining	20 $\mu\text{l} \times 1$	MT15-10	Endocytosis
	20 $\mu\text{l} \times 3$	MT15-12	
Oxidative Stress			Other Organelles Exosome, Lipid Droplet, etc.
mtSOX Deep Red - Mitochondrial Superoxide Detection	100 nmol $\times 1$	MT14-10	
	100 nmol $\times 3$	MT14-12	
Mito-FerroGreen	1 set (50 $\mu\text{g} \times 2$)	M489-10	
Si-DMA for Mitochondrial Singlet Oxygen Imaging	2 μg	MT05-10	
MitoPeDPP	5 $\mu\text{g} \times 3$	M466-10	

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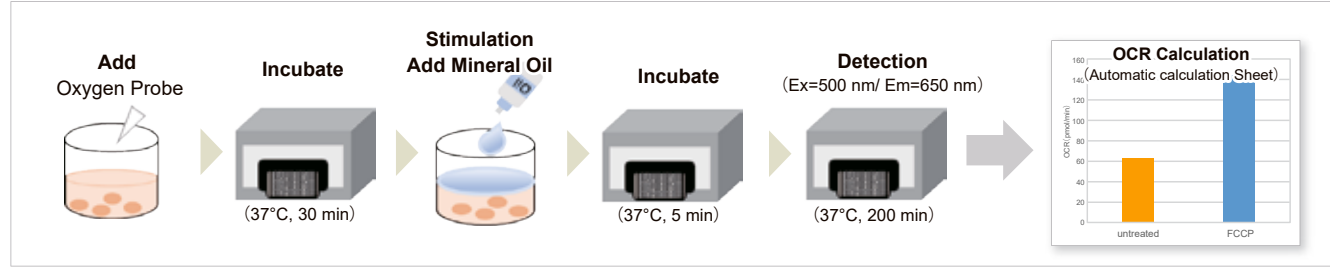
Mitochondrial Research Extracellular OCR Plate Assay Kit



- Applicable to regular fluorescent plate reader with temperature-controlled incubation
- No need for an expensive instrument, special medium, and plates
- All-in-One Kit with OCR calculation Sheets



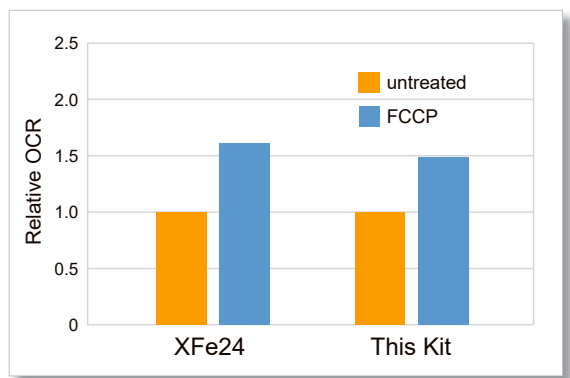
Procedure



Comparison with Flux Analyzer

Flux Analyzer (XFe24) and this kit were measured on the same day under the same conditions (cell type, cell number, and FCCP concentration). As a result, correlated data of oxygen consumption rate changes were obtained for XFe24 and this kit.

Cells: HepG2
 Cell Number: 5×10^4 cells/well
 Stimulation: FCCP (Carbonyl cyanide 4-(trifluoromethoxy) phenylhydrazone)
 FCCP Concentration: 2 µmol/l

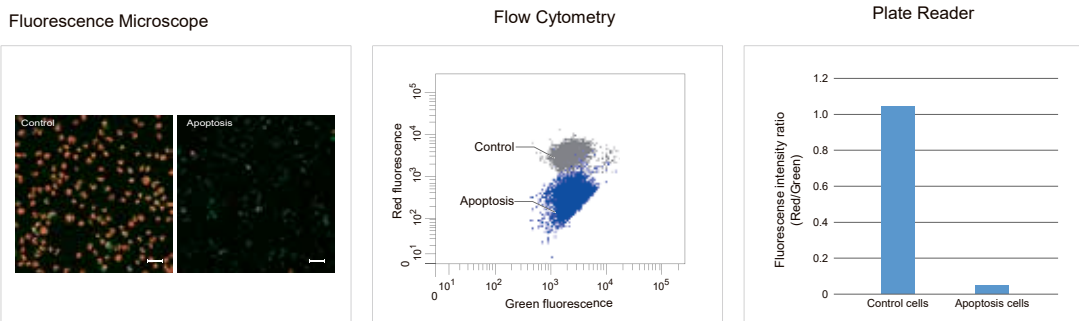


Description	Unit	Code
Extracellular OCR Plate Assay Kit	100 tests	E297-10

Mitochondrial Membrane Potential Detection JC-1 MitMP Detection Kit



JC-1 forms aggregate (in healthy mitochondria) with red fluorescence. As membrane potential decreases, JC-1 becomes monomers, which shows in green fluorescence. The change in ratio of red to green fluorescence is used as an indicator of mitochondrial condition.

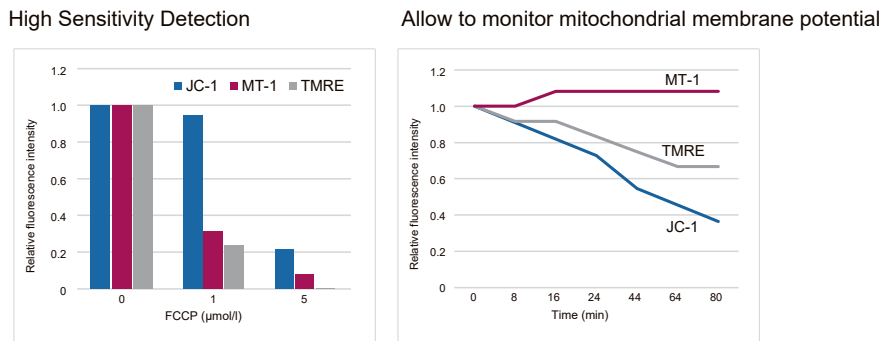


Description	Unit	Code
JC-1 MitMP Detection Kit	1 set	MT09-10

Mitochondrial Membrane Potential Detection MT-1 MitMP Detection Kit



JC-1 dye, TMRE, and TMRM are widely used to monitor MMP, however, these dyes have some limitations, such as low photostability and poor retention after aldehyde fixation. These limitations result in poor reproducibility of experiments. Dojindo's MT-1 MitMP Detection Kit overcomes these limitations. In addition, the Imaging Buffer included in this kit minimizes background fluorescence and maintains cell vitality while the assay is being performed.



Description	Unit	Code
MT-1 MitMP Detection Kit	1 set	MT13-10

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Oxidative
Stress

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Mitochondria

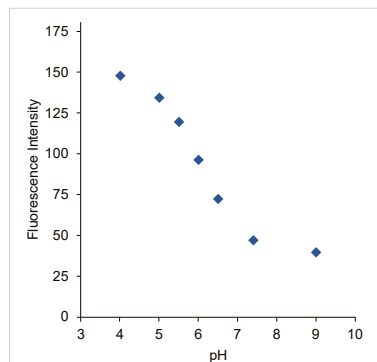
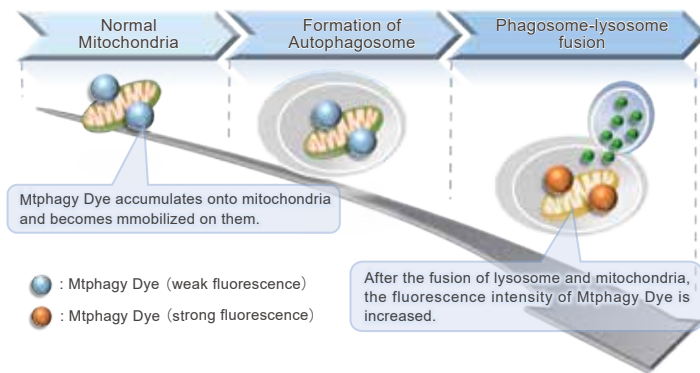
Lysosome

Endocytosis

Other Organelles
Exosome, Lipid Droplet, etc.

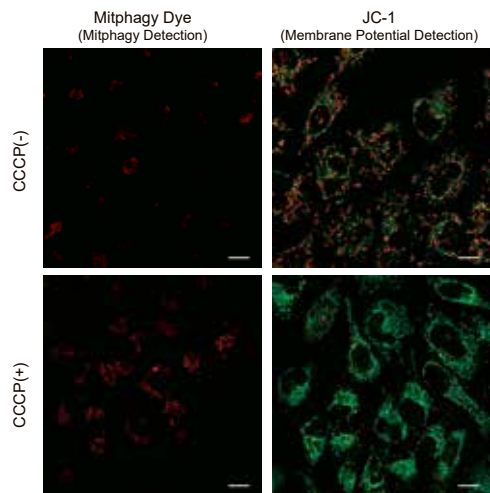


This kit is composed of Mtpahgy Dye, reagent for detection of mitophagy, and Lyso Dye. Mtpahgy Dye accumulates in intact mitochondria, is immobilized on it with chemical bond and exhibits a weak fluorescence from the influence of surrounding condition. When Mitophagy is induced, the damaged mitochondria fuses to lysosome and then Mtpahgy Dye emits a high fluorescence. To confirm the fusion of Mtpahgy Dye–labeled mitochondria and lysosome, Lyso Dye included in this kit can be used.



The fluorescent intensity of Mtpahgy Dye is increased at pH 4-5.

Mitophagy Induction and Mitochondrial Membrane Potential Changes



Mitochondrial condition in the carbonyl cyanide m-chlorophenyl hydrazine (CCCP) treated Parkin-expressing HeLa cells was compared with untreated cells using Mitophagy Detection Kit (MD01, MT02) and JC-1 MitoMP Detection Kit (MT09).

Result:

As a result, mitophagy was hardly detected in the CCCP-untreated cells, and mitochondrial membrane potential was maintained normally. On the other hand, in CCCP-treated cells, we observed a decrease in mitochondrial membrane potential (decrease in red fluorescence of JC-1) and induction of mitophagy (increase in fluorescence of Mtpahgy Dye).

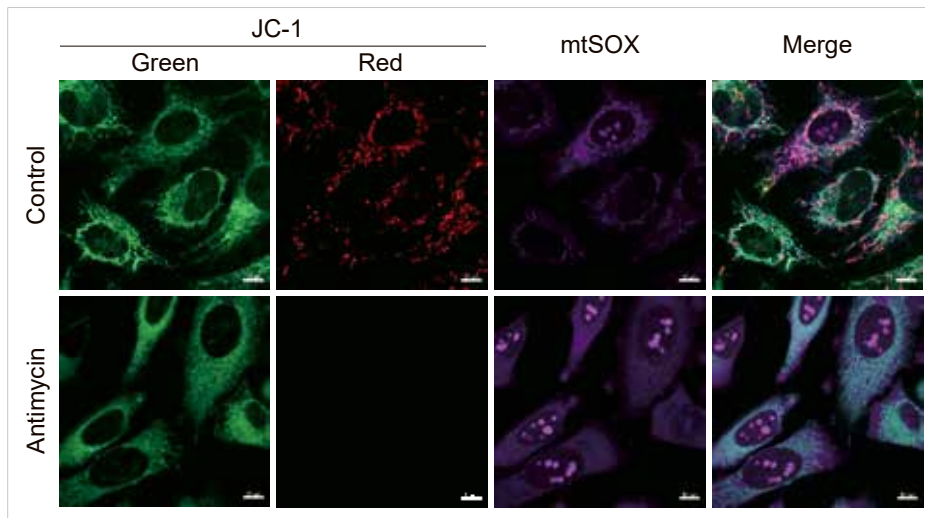
	Description	Unit	Code
	Mitophagy Detection Kit	1 set	MD01-10
	Mtpahgy Dye	5 µg × 3	MT02-10

Mitochondrial Superoxide Detection mtSOX Deep Red



Dojindo's mtSOX Deep Red overcomes these limitations. This dye emits deep red fluorescence; its fluorescence does not overlap with emission wavelengths that other red fluorescent markers use. Furthermore, the mtSOX Deep Red is better able to selectively detect superoxide, compared to Company T' product Red. Altogether, mtSOX Deep Red is a powerful tool for researchers with a limited number of cells and can provide an understanding of how mitochondria are altered during different treatments and physiological or pathological states.

Simultaneously Evaluation of Mitochondrial Superoxide and Membrane Potential



<Imaging Conditions>
(Confocal microscopy)
JC-1: Green Ex = 488, Em = 490-520 nm,
Red: Ex = 561, Em = 560-600 nm
mtSOX: Ex = 633 nm, Em = 640-700 nm
Scale bar: 10 μ m

After HeLa cells were washed with HBSS, co-stained with mtSOX Deep Red and mitochondrial membrane potential staining dye (JC-1: code MT09 or MT-1: code MT13), and the generated mitochondrial ROS and membrane potential were observed simultaneously. As a result, the decrease in mitochondrial membrane potential and the generation of mitochondrial ROS are simultaneously observed.



Description	Unit	Code
mtSOX Deep Red - Mitochondrial Superoxide Detection	100 nmol \times 1	MT14-10
	100 nmol \times 3	MT14-12

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Mitochondrial Superoxide Detection

Mito-FerroGreen

Mito-FerroGreen

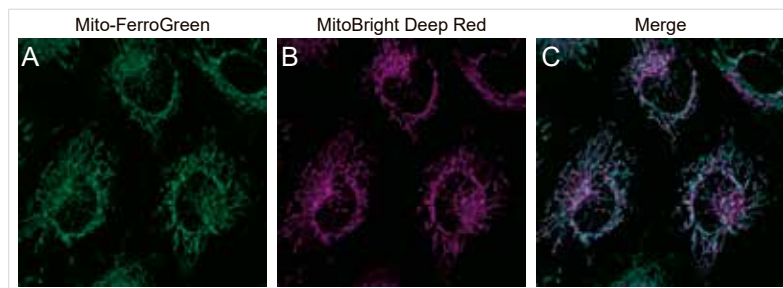
FerroOrange



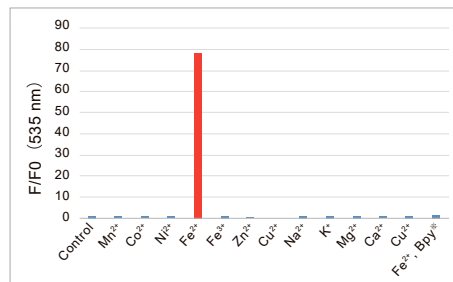
Mito-FerroGreen is a novel fluorescent probe for the detection of ferrous ion (Fe^{2+}) in mitochondria where Fe-S clusters and heme proteins are synthesized, and enables live cell fluorescent imaging of intracellular Fe^{2+} . Mito-FerroGreen has no chelating ability. Mito-FerroGreen and Fe^{2+} react irreversibly, which is different from the detection principle of calcium-iron probes such as Fluo-3.

Double staining with mitochondrial staining probe

HeLa cells incubated with Mito-FerroGreen and MitoBright Deep Red, treated with ammonium iron(II) sulfate, were observed by fluorescence microscopy.



Metal ion Selectivity



※ Bpy : 2,2'-Bipyridyl

Double staining with mitochondrial staining probe

Mito-FerroGreen (5 $\mu\text{mol/l}$) Ex/Em = 488 nm/ 500-550 nm

MitoBright Deep Red (200 nmol/l) Ex/Em = 640 nm/ 656-700 nm

A Mito-FerroGreen

B MitoBright Deep Red

C Merge

Iron Detection Dyes

	Mito-FerroGreen (M489)	FerroOrange (F374)
Localization	Mitochondria	Intracellular
Fluorescent Property	λ_{ex} 505 nm, λ_{em} 535 nm	λ_{ex} 543 nm, λ_{em} 580 nm
Instrument (filter)	Fluorescence microscope (FITC, GFP)	Fluorescence microscope, plate reader (Cy3)
Sample	Live Cell	Live cell
The number of assays	1 set (50 μg x 2) 10 assays at 35 mm dish (final concentration 5 $\mu\text{mol/l}$)	1 tube (24 μg) 17 assays at 35 mm dish (final concentration 1 $\mu\text{mol/l}$)

Description	Unit	Code
Mito-FerroGreen	1 set (50 μg x 2)	M489-10
FerroOrange	1 tube	F374-10
	3 tube	F374-12

Mitochondrial Staining

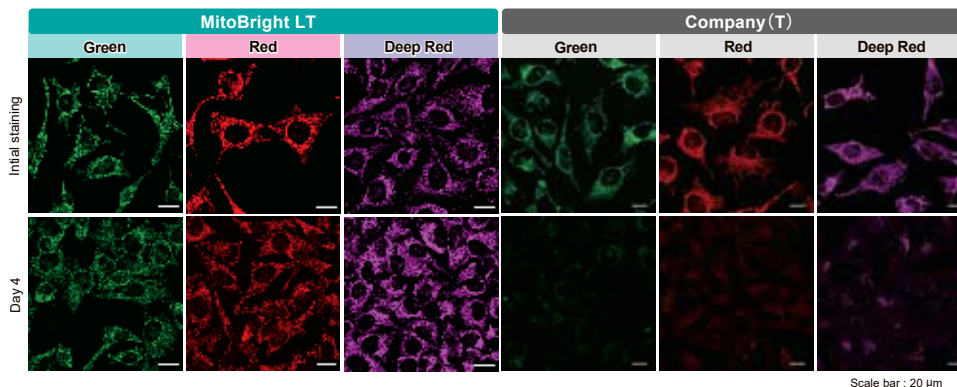
MitoBright LT Series



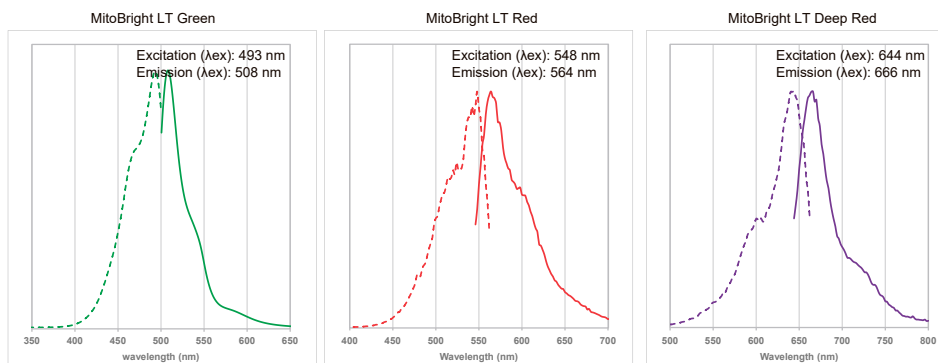
MitoBright LT dyes are designed to exhibit mitochondria retention for long-term visualization. In addition, the MitoBright LT dyes show stronger fluorescence signals compared with other commercially available dyes that contain the chloromethyl moiety. The MitoBright LT dyes offer three different color options (Green, Red and Deep Red), and are provided as a ready-to-use DMSO solution. A working solution can easily be prepared in a single dilution step with growth medium or HBSS.

Stained in serum-contained media

HeLa cells were stained with MitoBright LTs or an existing reagent and observed after 4 days. MitoBright LT remained unchanged and observable even after 7 days, while the existing reagent's intensity decreased.



Fluorescence Properties



Description	Unit	Code
MitoBright LT Green	400 μl	MT10-12
MitoBright LT Red	400 μl	MT11-12
MitoBright LT Deep Red	400 μl	MT12-12

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