Reagent for Cellular Function Analysis

Autophagy

- Autophagic Flux Assay Kit
- DALGreen-Autophagy Detection
- DAPGreen-Autophagy Detection
- DAPRed-Autopagy Detection

Senescence

- Cellular Senescence Detection Kit -SPiDER-βGal
- Cellular Senescence Plate Assay Kit -SPiDER-βGal

Neurodegenerative Diseases

Cancer

Senescence

Mitochondria

- Mitophagy Detection Kit
- JC-1 MitoMP Detection Kit
- MitoBright LT Series
- MT-1 MitoMP Detection Kit
- MitoBright ROS Deep Red
- Extracellular OCR Plate Assay Kit

Cellular Metabolism

- Glycolysis / OXPHOS Assay Kit
- ATP Assay Kit-Luminescence
- Lactate Assay Kit-WST

Ferroptosis

- FerroOrange
- Liperfluo
- Mito-FerroGreen
- MitoPeDPP
- Cystine Uptake Assay Kit
- MDA Assay Kit
- Lipid Peroxidation Probe -BDP 581/591 C11-

Cancer

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MD01	Mitophagy Detection Kit	28
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D676	DAPGreen - Autophagy Detection	10
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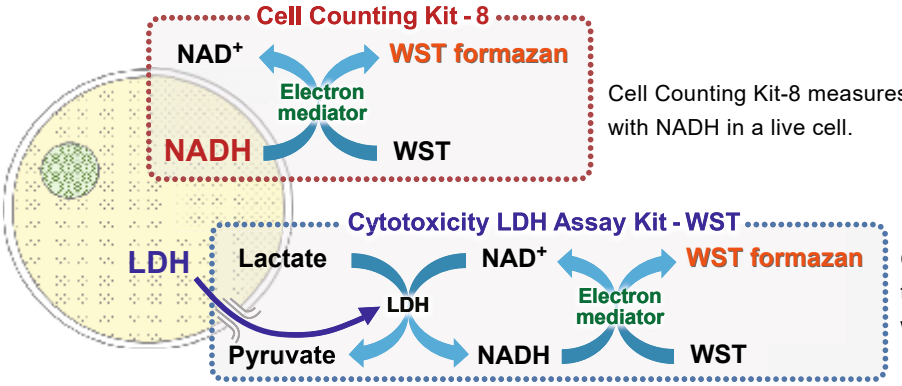
Cell Proliferation / Cytotoxicity Assay

Cell Counting Kit-8
Cytotoxicity LDH Assay Kit-WST

Cell Counting Kit-8 Cytotoxicity LDH Assay Kit-WST

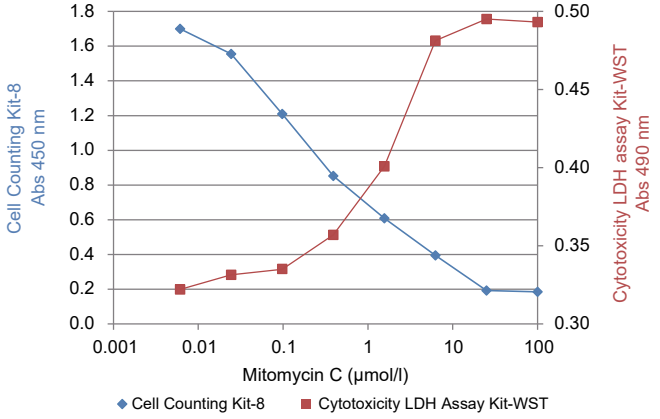
Detection Principle



Cell Counting Kit-8 measures the dehydrogenase activity with NADH in a live cell.

Cytotoxicity LDH Assay Kit-WST measures the LDH released by dead cells. when the plasma membrane is destructed.

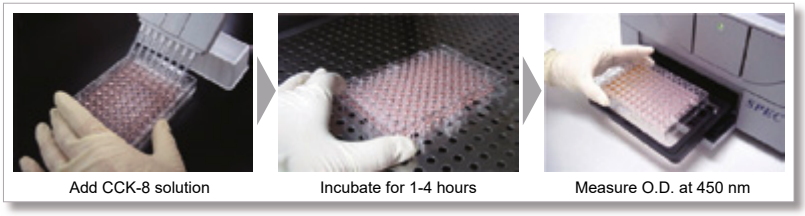
Simultaneous Usage of CCK-8 and Cytotoxicity LDH Assay Kit-WST



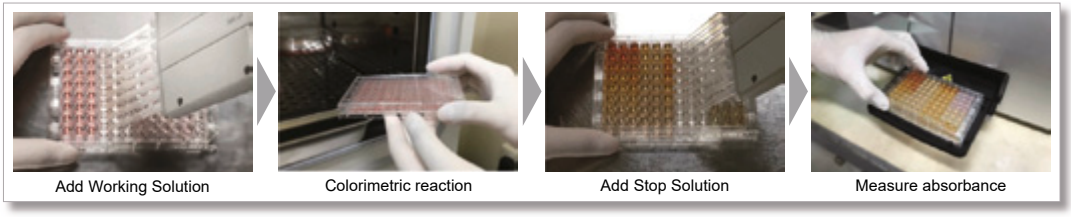
Drug: Mitomycin C
Cell Line: HeLa
Media: MEM, 10% FBS
Incubation: 37°C, 5% CO_2 for 48 hours
Measuring Condition: Cell Counting Kit-8 (450 nm)
Cytotoxicity LDH Assay Kit-WST (490 nm)

Simple Procedure

・Cell Counting Kit-8

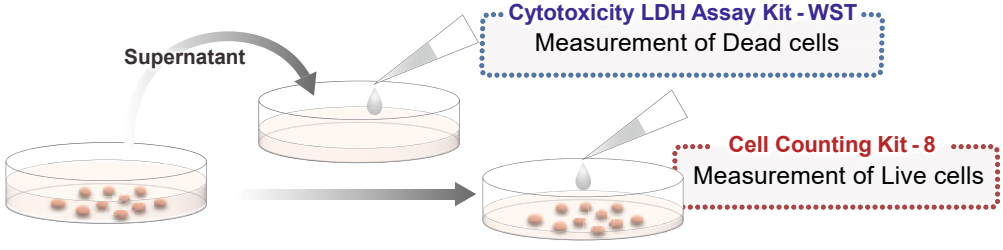


・Cytotoxicity LDH Assay Kit-WST



Same Samples can be used

Since same samples can be used for Cell Counting Kit-8 and Cytotoxicity LDH Assay Kit-WST, the method is convenient and time efficient.



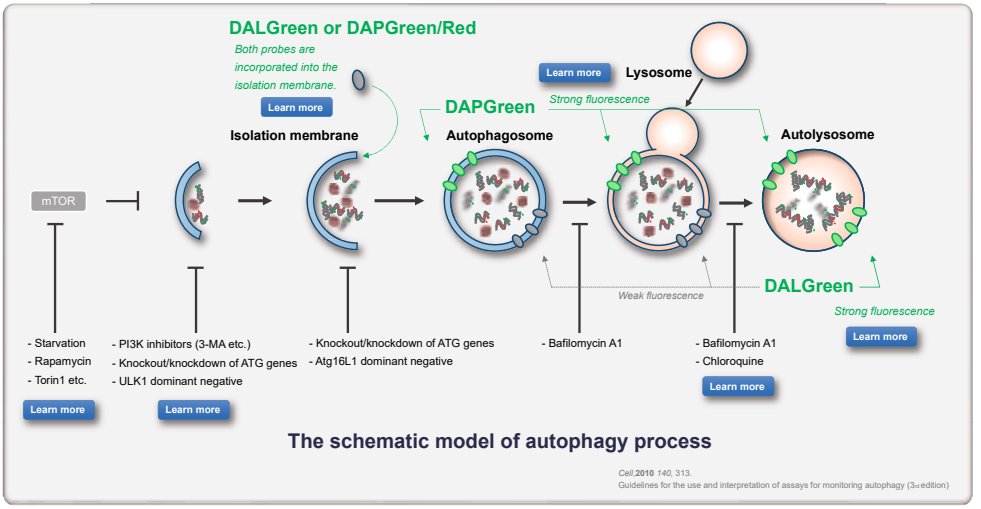
Description	Unit	Code
Cell Counting Kit-8	500 tests	CK04-05
	1000 tests	CK04-11
	3000 tests	CK04-13
	10000 tests	CK04-20
Cytotoxicity LDH Assay Kit-WST	100 tests	CK12-01
	500 tests	CK12-05
	2000 tests	CK12-20

D675 D676 D677

Autophagy

DAPGreen / Red - Autophagy Detection
DALGreen - Autophagy Detection

DAPGreen and DAPRed detect autophagosomes, while DALGreen detects autolysosomes. These dyes are permeable to cells and enables live cell imaging with fluorescence microscopy, and DAPGreen and DALGreen allow for quantitative assay by flow cytometry. Autophagy is an intracellular degradation system involving autophagosome formation, detected by DAPGreen and DAPRed, and lysosome fusion, detected by DALGreen, which fluoresces intensity increases in acidic conditions.

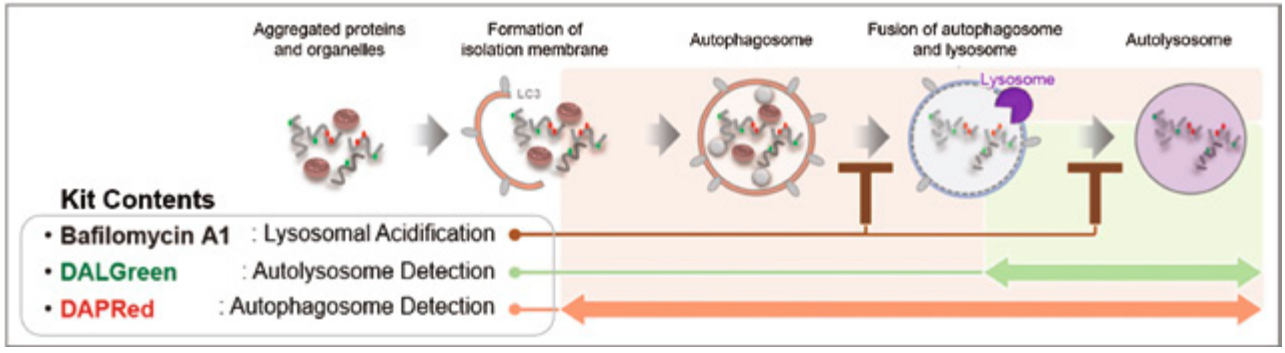


Feature of Each Dye

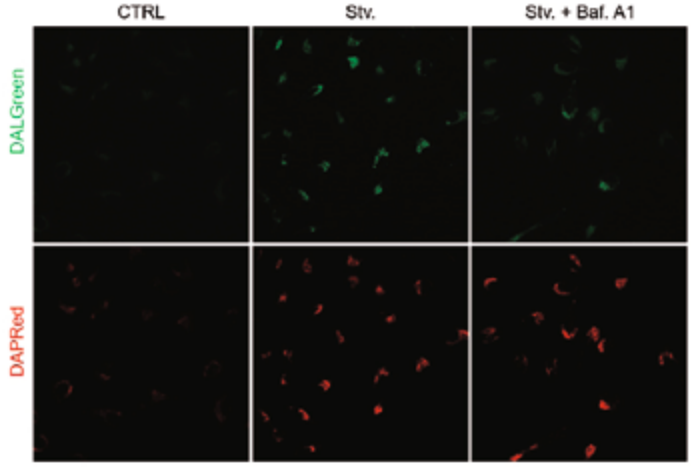
	Applicable instruments			Fluorescent properties	Volume / the number of usable assays	Existing methods
	Fluorescent Microscope	Flow cytometer	Microplate reader			
DAPGreen	✓	✓	✓	Ex = 425-475 nm Em = 500-560 nm * For confocal microscope,the sample can be excited at 488 nm	5 nmol x 1 / 35 mm dish: 25 (when used in 1.0 μmol/l)	LC3-GFP MDC Cyto-ID etc.
DAPRed	✓			Ex = 500-560 nm Em = 690-750 nm	5 nmol x 1 / 35 mm dish: 25 (when used in 1.0 μmol/l)	
DALGreen	✓	✓		Ex = 350-450 nm Em = 500-560 nm * For confocal microscope,the sample can be excited at 488 nm	20 nmol x 1 / 35 mm dish: 10 (when used in 1.0 μmol/l)	LC3-GFP-RFP etc.

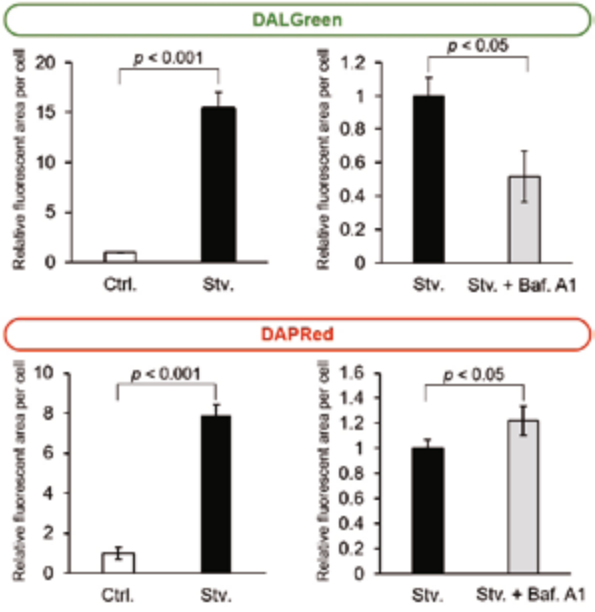
*Double staining imaging by DAPGreen and DALGreen is not possible

Autophagic Flux Assay Kit



Experimental Example: Autophagy Flux Analysis





By culturing HeLa cells in HBSS with starvation, autophagy was induced and DAPRed and DALGreen fluorescence increased. Addition of Baf. A1 decreased DALGreen fluorescence, indicating that autolysosomes were reduced and Autophagy Flux was inhibited.

Quantification method: Fluorescence values (area) were obtained in Image J and normalized by the number of cells per field of view*. Number of samples: n=3
*Please obtain images with the same number of cells per field of view as possible.

Description	Unit	Code
Autophagic Flux Assay Kit	1 set*	A562-10
DALGreen - Autophagy Detection	20 nmol	D675-10
DAPGreen - Autophagy Detection	5 nmol	D676-10
DAPRed - Autophagy Detection	5 nmol	D677-10

*Equivalent to 5 dishes (35 mm dish)

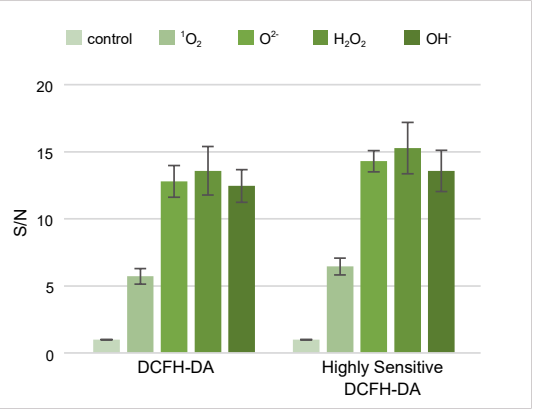
Oxidative Stress

ROS Assay Kit -Highly Sensitive DCFH-DA-

ROS Assay Kit -Highly Sensitive DCFH-DA- overcomes these limitations. The dye allows ROS detection with higher sensitivity than DCFH-DA. Moreover, the Loading Buffer included in this kit maintains cellular health during assays.

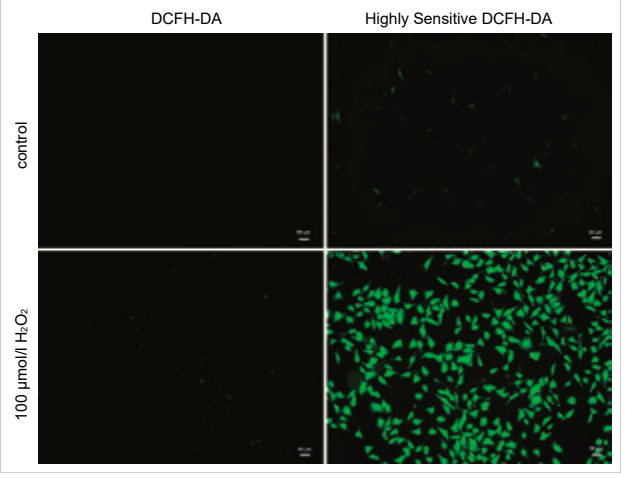
The reactivity of the Highly Sensitive DCFH-DA for ROS is similar to the reactivity of 2'-7' dichlorofluorescein diacetate (DCFH-DA). The Highly Sensitive DCFH-DA also has similar fluorescence characteristics (λ_{ex}: 505 nm, λ_{em}: 525 nm) to DCFH-DA. Therefore, ROS is detectable at the same excitation/fluorescence wavelength.

The selectivity for ROS

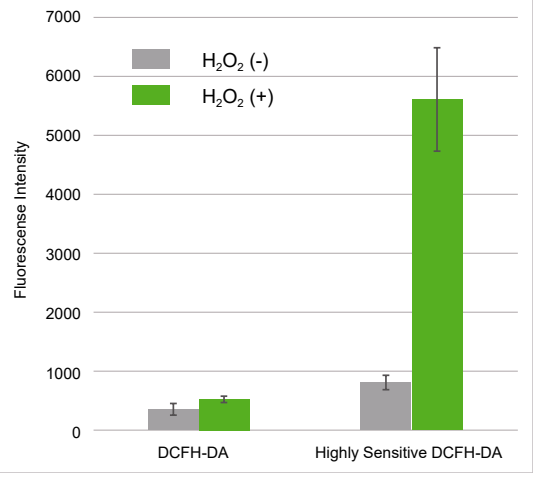


High Sensitive Detection Compared with DCFH-DA

Detection using fluorescent microscope



Detection using microplate reader



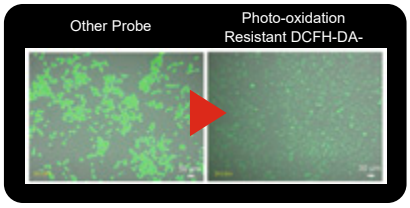
Hydrogen peroxide (H_2O_2)-treated HeLa cells (1×10^4 cells/ml) were stained with DCFH-DA or the ROS Assay Kit-Highly Sensitive DCFH-DA, and the fluorescence intensity of intracellular ROS was compared between two detection kits. As a result, the ROS Assay Kit-Highly Sensitive DCFH-DA in high-sensitivity detection of intracellular ROS was better than DCFH-DA.

Description	Unit	Code
ROS Assay Kit -Highly Sensitive DCFH-DA-	100 tests	R252-10

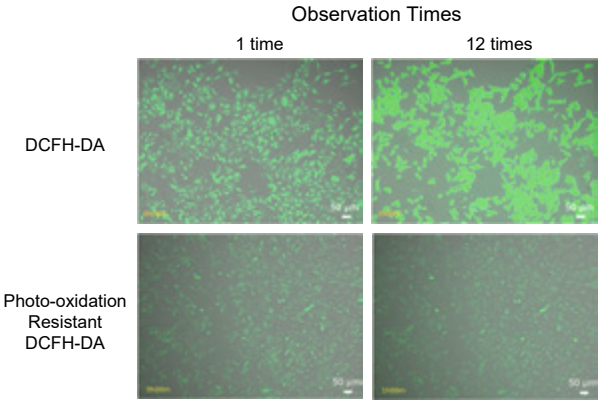
ROS Assay Kit -Photo-oxidation Resistant DCFH-DA-

The dye that is employed in this kit allows ROS detection with higher sensitivity than DCFH-DA; It does not leak from cells because the fluorescent dye can immobilize protein via a chemical bond, and it is resistant to photo-oxidation compared with DCFH-DA. Moreover, the Loading Buffer in the kit maintains cellular health during assays.

Time-lapse imaging movie Available

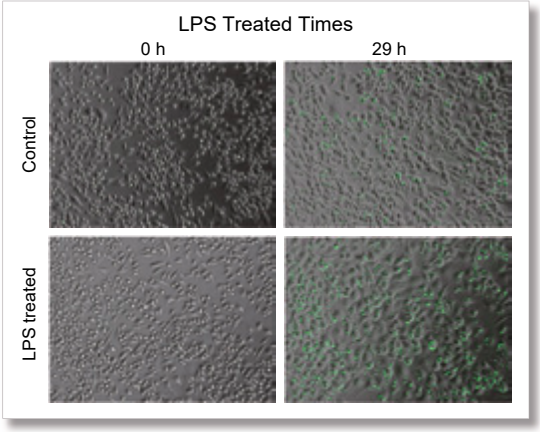


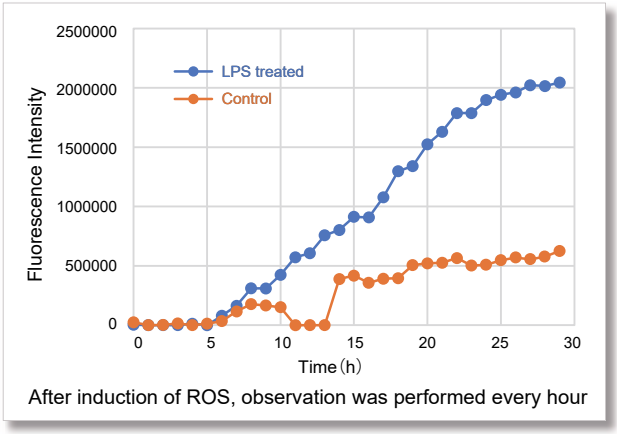
Resistant to Photo-oxidation



Comparison of photo-oxidation resistant ability in HeLa cells
* Followed different experimental conditions for each probe

Simultaneous Detection of ROS in LPS-treated macrophages





After induction of ROS, observation was performed every hour

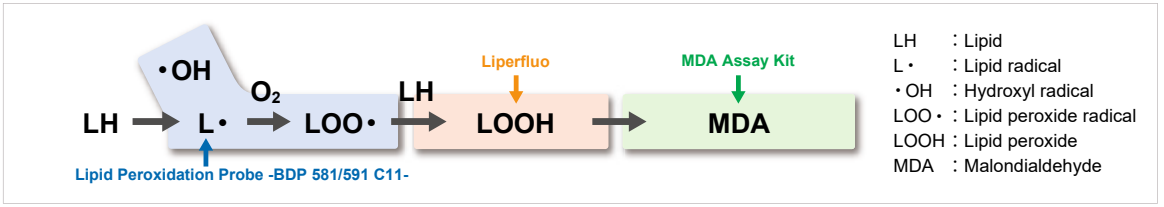
In Lipopolysaccharide (LPS) treated RAW 264.7 cells, after being stained with regular DCFH-DA, Highly Sensitive DCFH-DA, or Photo-oxidation Resistant DCFH-DA, the intracellular ROS level was compared. The results showed that the Dojindo Laboratories' probes could detect intracellular ROS with higher sensitivity.

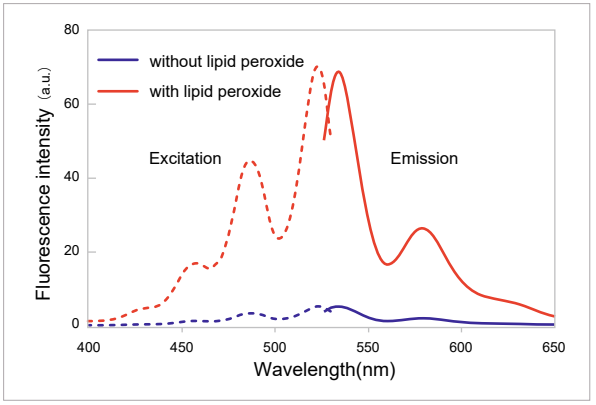
Description	Unit	Code
ROS Assay Kit -Photo-oxidation Resistant DCFH-DA-	100 tests	R253-10

Lipid Peroxide Detection

Liperfluo

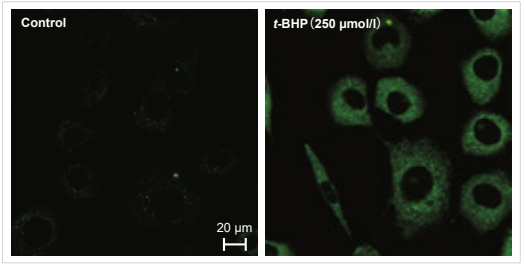
Liperfluo is a Dojindo-developed fluorescence probe to specifically detect lipid peroxides with minimal photo-damage or auto-fluorescence. It emits intense fluorescence in organic solvents and is nearly non-fluorescent in aqueous media. Liperfluo's tetraethyleneglycol group increases its solubility and makes it suitable for imaging lipid peroxides in cell membranes. It's used to monitor lipid peroxidation in ferroptosis research through fluorescence microscopy and flow cytometry.





Excitation and emission
without lipid peroxide spectra of Liperfluo with or without lipid peroxide in ethanol.

Lipid Peroxide Detection in Living Cells



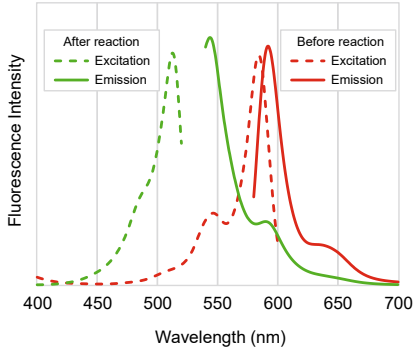
Liperfluo added to cells, t-BHP induced lipid peroxidation and cells were observed under confocal microscope to study ferroptosis.

Cell line: L929
Microscope: Zeiss LSM510META
Filter type: FITC (GFP, Alexa488) wide filter
HFT UV/488
NFT490
BP505-550

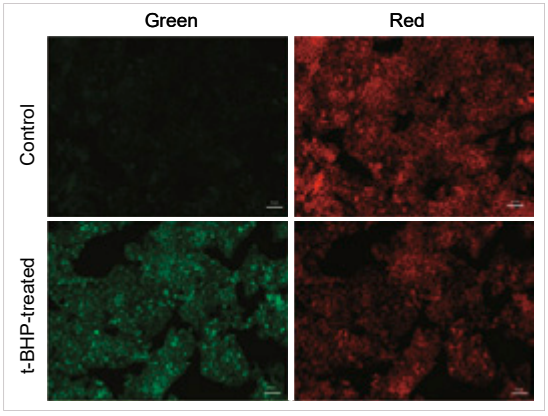
Description	Unit	Code
Liperfluo	1 set (50 μg × 5)	L248-10

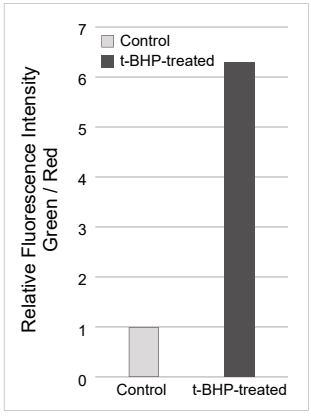
Lipid Peroxidation Probe -BDP 581/591 C11-

Lipid Peroxidation Probe -BDP 581/591 C11- is a fluorescent probe for detecting lipid peroxidation. This fluorescent probe does not react with lipid peroxides but reacts with lipid radicals generated when lipids are peroxidized, resulting in the detection of lipid peroxidation. The unreacted probe emits red fluorescence, but after reacting with radicals around lipids, it changes its fluorescence from red to green. Thus, lipid peroxidation can be detected with high sensitivity because it is detected by the ratio of red to green fluorescence intensity.



Lipid Peroxidation Assay





HepG2 cells stained with this probe were stimulated with HBSS solution containing 200 µmol/l *t*-BHP for 2 hours, and the fluorescence intensity was compared with control cells. As a result, a decrease in red fluorescence and an increase in green fluorescence were observed with high sensitivity in *t*-BHP-treated cells compared to untreated cells. The cells were detected using a plate reader, and the values obtained were calculated as the intensity ratio of green/red fluorescence, which allowed quantified lipid peroxidation. Furthermore, an increase in the histogram of green fluorescence was observed when the cells were detected using a flow cytometer. Which improves that this dye is three different instruments.

<Experimental Conditions>
Fluorescent Microscope
Green: GFP filter (Ex = 450-490 nm, Em = 500-550 nm)
Red: TexasRed filter (Ex = 540-580 nm, Em = 600-660 nm)
Scale bar: 50 µm

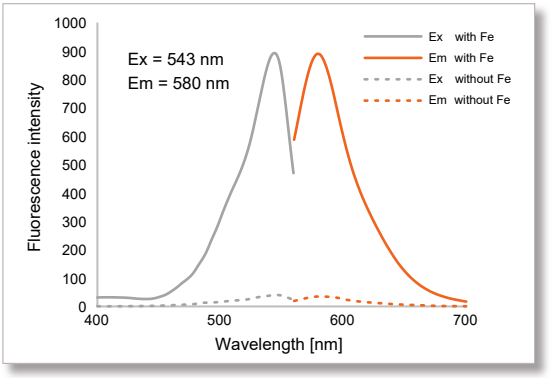
Fluorescent Plate Reader
Green: Ex = 490 nm, Em = 520-540 nm
Red: Ex = 570 nm, Em = 600-620 nm

Description	Unit	Code
Lipid Peroxidation Probe -BDP 581/591 C11-	200 tests	L267-10

Intracellular Iron Ion Measurement

FerroOrange

Liperfluo is a Dojindo-developed fluorescence probe to specifically detect lipid peroxides with minimal photo-damage or auto-fluorescence. It emits intense fluorescence in organic solvents and is nearly non-fluorescent in aqueous media. Liperfluo's tetraethyleneglycol group increases its solubility and makes it suitable for imaging lipid peroxides in cell membranes. It's used to monitor lipid peroxidation in ferroptosis research through fluorescence microscopy and flow cytometry.



Experimental Example

HeLa cells treated with chelator of iron 2,2′-bipyridyl (Bpy) (100 μmol/l) or Ammonium iron (II) sulfate (100 μmol/l) were prepared. The change of intracellular Fe^{2+} in HeLa cells was detected by the FerroOrange.

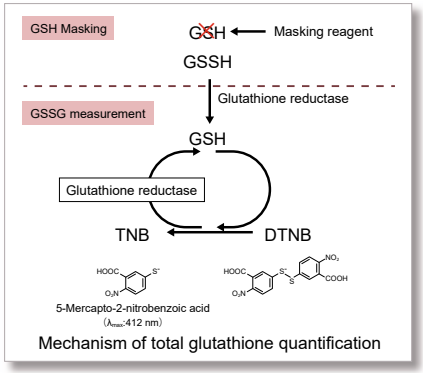
Ex = 561 nm, Em = 570-620 nm, Scale bars 20 μm

Description	Unit	Code
FerroOrange	1 tube	F374-10
	3 tube	F374-12

Quantification of Reduced (GSH) and Oxidized (GSSG) Glutathione

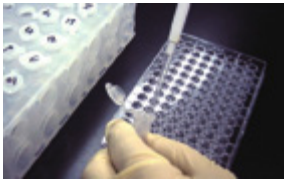
GSSG/GSH Quantification Kit

The GSSG/GSH Quantification kit contains Masking Reagent of GSH. GSH will be deactivated in the sample by simply adding the Masking Reagent. Then, using the enzymatic recycling system, only the GSSG will be detected by measuring the absorbance (λmax = 412 nm) of DTNB (5,5-dithio-bis- (2-nitrobenzoic acid). The quantity of GSH can also be determined, by substracting GSSG from the total amount of glutathione. With this kit, GSH/ GSSG concentrations from 0.5 µmol/l to 50 µmol/l and GSSG concentrations from 0.5 µmol/l to 25 µmol/l can be quantified.

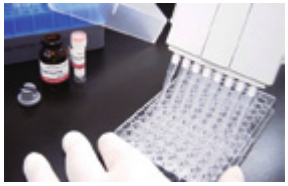


Mechanism of total glutathione quantification

Assay Procedure

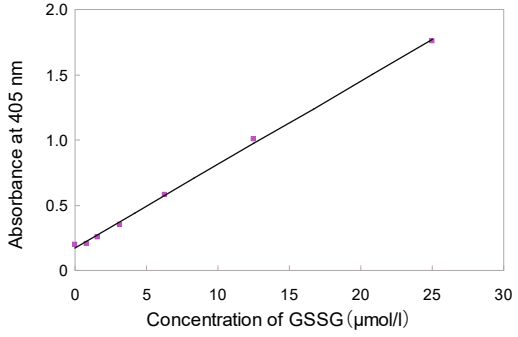

1) GSSG/GSH Standard Solution and add Sample A or Sample B to each well.
2) Add Buffer solution to each well


3) Incubate at 37℃ for 1 h.

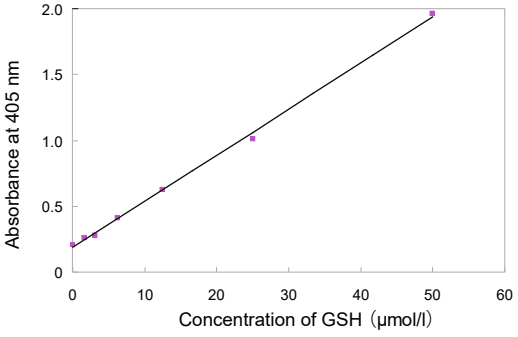

4)-5) Add substrate working solution and Enzyme/ Coenzyme working solution to each well.


6)-7) After incubating at 37℃ for 10 minutes, measure the absorbane of each well with a microplate.

Calibration Curve



The Calibration curve (GSSG) was prepared using the pseudoendpoint method (10 minutes)



The Calibration curve (GSH) was prepared using the pseudoendpoint method (10 minutes)

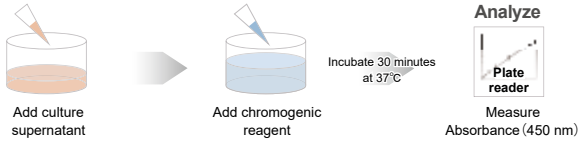
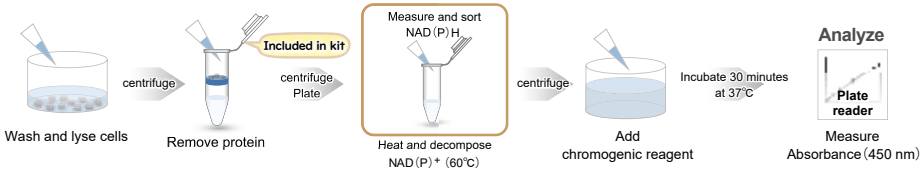
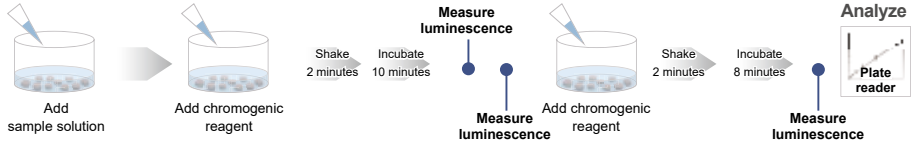
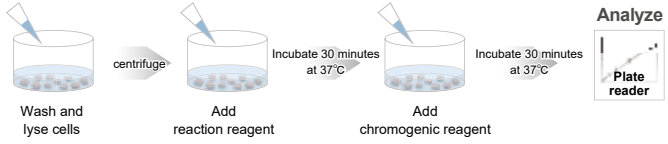
Description	Unit	Code
GSSG/GSH Quantification Kit	200 tests	G257-10

Measurements of Intracellular Metabolism

Description	Unit	Code
Starter Kit		
Glycolysis/OXPHOS Assay Kit	50 tests	G270-10
Glycolysis/JC-1 MitoMP Assay Kit	50 tests	G272-10
Quantification for Intracellular Metabolism		
ATP Assay Kit-Luminescence	50 tests	A550-10
	200 tests	A550-12
ADP/ATP Ratio Assay Kit-Luminescence	100 tests	A552-10
Glucose Assay Kit-WST	50 tests	G264-05
	200 tests	G264-20
Glutamine Assay Kit-WST	100 tests	G268-10
Glutamate Assay Kit-WST	100 tests	G269-10
α-Ketoglutarate Assay Kit-Fluorometric	100 tests	K261-10
Lactate Assay Kit-WST	50 tests	L256-10
	200 tests	L256-20
NAD/NADH Assay Kit-WST	100 tests	N509-10
NADP/NADPH Assay Kit-WST	100 tests	N510-10
Uptake Assay Kit		
Glucose Uptake Assay Kit-Blue	1 set	UP01-10
Glucose Uptake Assay Kit-Green	1 set	UP02-10
Glucose Uptake Assay Kit-Red	1 set	UP03-10
Amino Acid Uptake Assay	20 tests	UP04-10
	100 tests	UP04-12
Cystine Uptake Assay Kit	20 tests	UP05-10
	100 tests	UP05-12
Fatty Acid Uptake Assay Kit	100 tests	UP07-10

Simple Procedure for First Time User

For a first-time user, the kit includes the reagents and components necessary for measuring samples. You'll soon realize how easy it is to use.

Determination index	Detection	Operation
Glucose Lactate Glutamine Glutamate NAD/NADH NADP/NADPH	Colorimetric	**Simply transfer the culture supernatant to a plate and mix it with the chromogenic reagent**  
ATP ADP/ATP	Luminescent	**Kit includes ATP standard - very easy to use**  
α-ketoglutaric acid	Fluorescent	**Less variable results than existing assays** 

Intracellular Metabolism

Glycolysis/JC-1 MitoMP Assay Kit

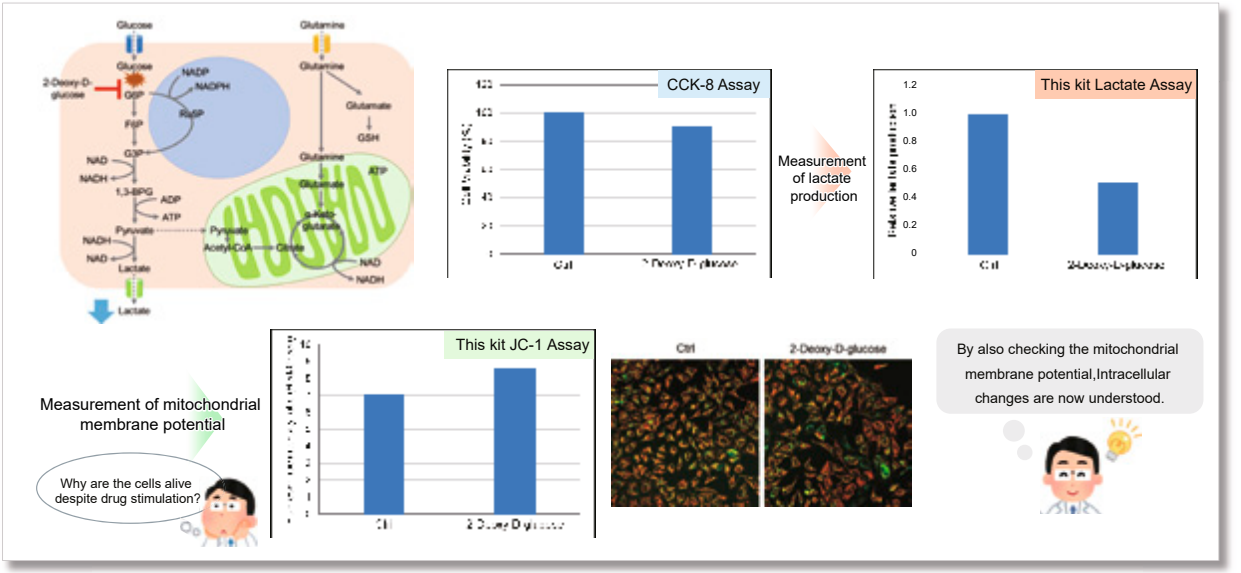
- Two indicators can be measured in one sample
  (Lactate production and mitochondrial membrane potential)
- Easy-to-understand detailed protocol

Intracellular metabolic changes caused by any stimulations can be detected by measuring lactate production and mitochondrial membrane potential. In certain instances, cells manage to survive despite sustaining damage to their glycolytic system or mitochondrial function, the principal pathways for energy production. It is understood that this occurs as cells strive to persist and prevent cell death by augmenting glycolysis even when mitochondrial function is compromised, or by activating mitochondrial function when glycolysis is impaired.

Experimental Example:
Intracellular metabolic changes in HeLa cells treated with the glycolytic inhibitor 2-Deoxy-D-glucose

When we evaluated cell viability in 2-DG-treated HeLa cells using the CCK-8* assay, we observed minimal changes in viability. However, given the observed decrease in lactate production, it prompted us to question how cell viability was maintained in spite of glycolytic system inhibition. To answer this, we examined the mitochondrial membrane potential using the JC-1 Assay. The results from this investigation suggest that HeLa cells preserve their survival by boosting mitochondrial function when the glycolytic system is inhibited by 2-DG.

* Cell Counting Kit-8 (product code: CK04) is not included in this kit.

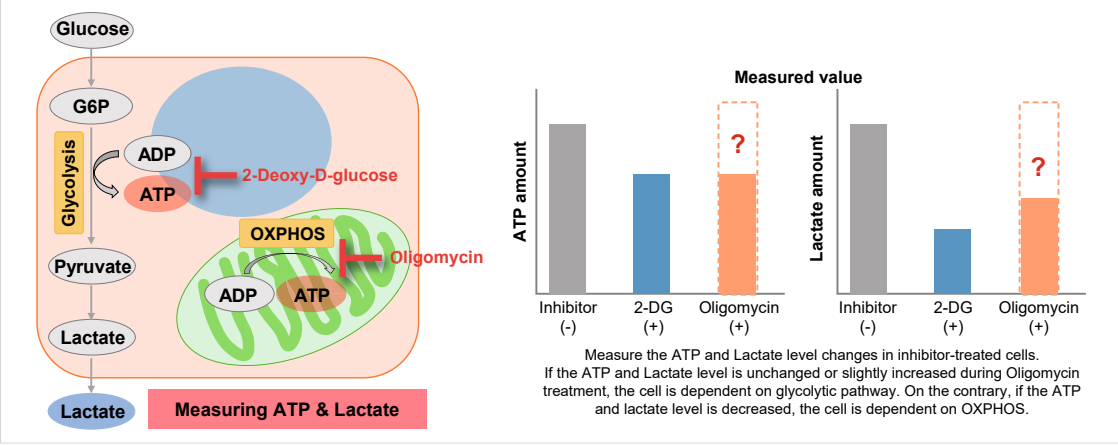


Description	Unit	Code
Glycolysis/JC-1 MitoMP Assay Kit	50 tests	G272-10

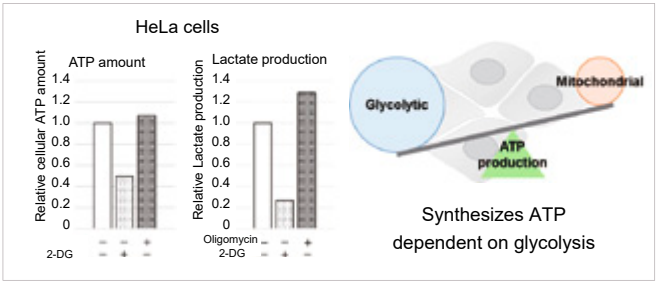
Glycolysis/OXPHOS Assay Kit

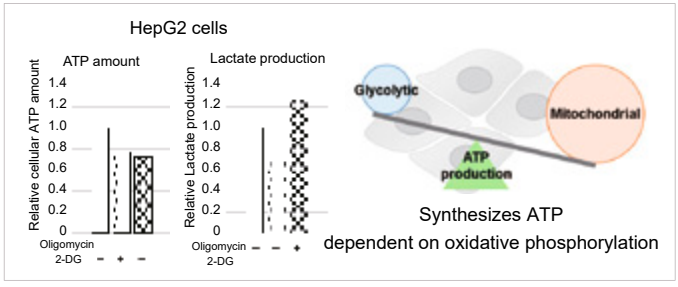
- Easy test via plate reader, no need for expensive equipment
- All reagent acquired is included, ready to use kit
- Easy-to-understand detailed protocol

Combining methods (1) and (2) can be used to measure the metabolic pathway dependency of cells.
Cells are treated with oligomycin or 2-DG to inhibit OXPHOS or ATP synthesis in the glycolytic pathway, and the amounts of ATP and lactate production are measured, respectively. Changes in the amount of ATP can be used to determine the efficiency of energy production, and changes in the amount of lactate produced can be used to determine changes in glycolytic capacity and evaluate whether cells are dependent on glycolysis or OXPHOS.



Experimental Example:
Comparison of metabolic pathway dependence in different cell line



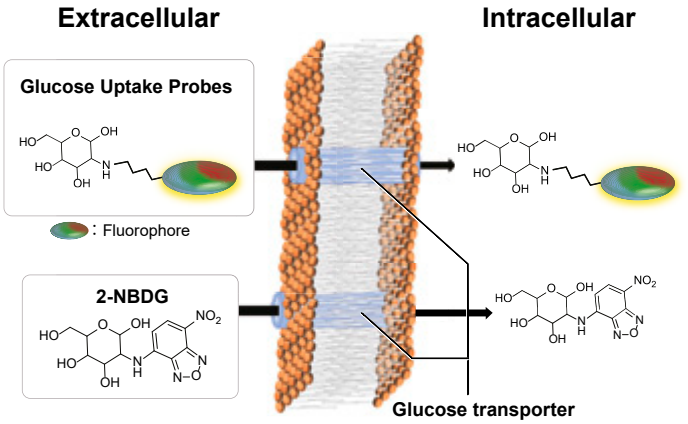


Description	Unit	Code
Glycolysis/OXPHOS Assay Kit	50 tests	G270-10

Intracellular Metabolism

Glucose Uptake Assay Kit

- Highly sensitive and simple measurement of glucose uptake capacity
- Applicable for microscopy & FCM
- Reduces dye leakage after staining



Glucose Uptake Probe allowing highly sensitive detection of cellular glucose uptake by fluorescence imaging or flow cytometry. The WI Solution in this kit can enhance cellular retention to provide more reliable experimental data. Also, compare with the existing method (2-NBDG), the measurement time can be significantly reduced.

Comparison with Existing Method

The comparison of the Glucose Uptake Probe Series and the existing method(2-NBDG) is as below.

product name	Fluorescence microscope	Plate reader detection	FCM detection	Retention ability	Fluorescence characteristics
Glucose Uptake Assay Kit-Blue	○	×	○	1 hour *	λex:386 nm λem:474 nm
Glucose Uptake Assay Kit-Green	○	○	○	1 hour *	λex:507 nm λem:518 nm
Glucose Uptake Assay Kit-Red	○	○	○	1 hour *	λex:560 nm λem:572 nm
2-NBDG	○	×	○	30 minutes or less *	λex:465 nm λem:540 nm

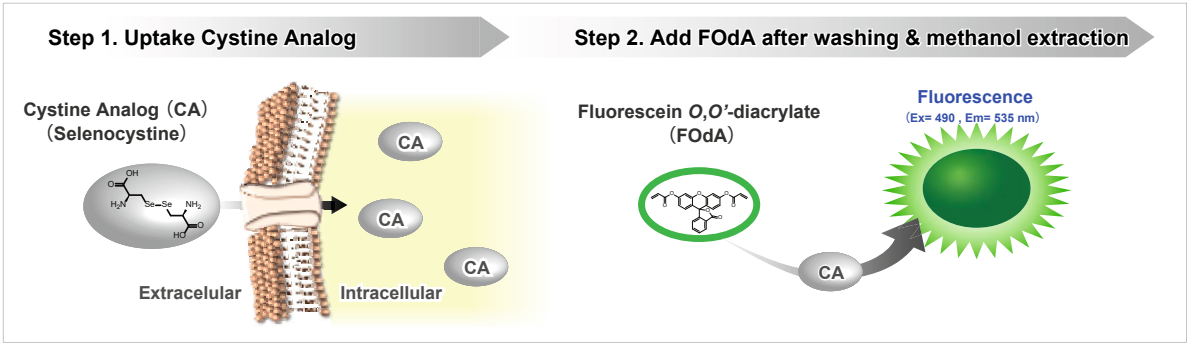
*Result of A549 cells, the retention time for other cell lines may be different.

Description	Unit	Code
Glucose Uptake Assay Kit-Blue	1 set	UP01-10
Glucose Uptake Assay Kit-Green	1 set	UP02-10
Glucose Uptake Assay Kit-Red	1 set	UP03-10

Cystine Uptake Assay Kit

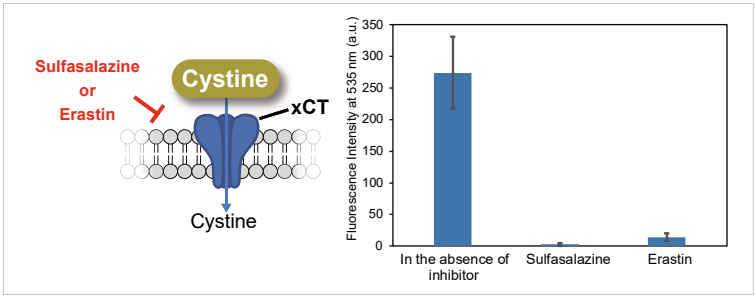
- Easier way to cystine uptake assay
- Applied for plate assay

The Cystine Analog (CA) in this kit can be taken up into cells via xCT, and the incorporated CA can be specifically detected using the Fluorescent Probe and Reducing Agent. Thus, the xCT activity can be measured easily.[Patent applied]



Evaluation of xCT inhibitor Sulfasalazine or Erastin

Using this kit, we measured the inhibitory effect of sulfasalazine and erastin on cystine uptake by HeLa cells. The fluorescence intensity of the sulfasalazine and elastin groups decreased significantly, indicating that both reagents inhibit cystine uptake.



Experiment Condiitons
Cell Line: HeLa cells
Pretreatment: DMEM (cystine-free, serum-free), 37°C, 5 min
Uptake conditions: 0.5 mmol/l sulfasalazine or 2 µmol/l erastin / Cystine Analog / DMEM (cystine-free, serum-free), 37°C, 30 min
Instrument: Fluorescent Plate Reader
Filter: Ex=485 nm, Em=535 nm

Description	Unit	Code
Cystine Uptake Assay Kit	20 tests	UP05-10
	100 tests	UP05-12

Mitochondrial Research

Mitochondrial Superoxide Detection

MitoBright ROS 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 Fe^{2+}

Mitophagy Detection

Mitophagy Detection Kit

Live-cell fluorescent imaging of mitophagy without transfection

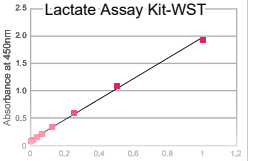
Measurement of Glucose

Glucose Assay Kit-WST

Measurement of intracellular glucose concentrations via fluorescence

Measurement of Lactate

Lactate Assay Kit-WST

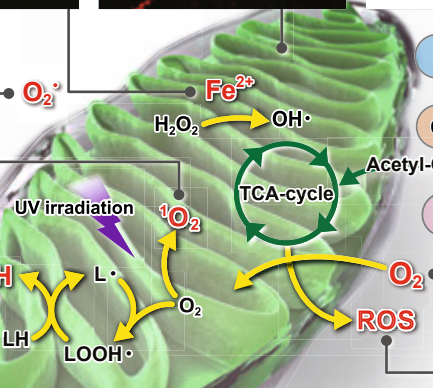


Measuring lactate to infer glycolytic activity

Singlet Oxygen Detection

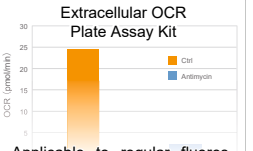
Si-DMA for Mitochondrial Singlet Oxygen Imaging

Real-time visualization of $^1O_2$ generation



Oxygen consumption rate (OCR) Detection

Extracellular OCR Plate Assay Kit



Applicable to regular fluorescent plate reader with temperature-controlled incubation

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

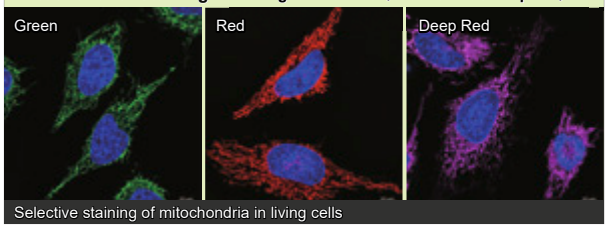
Monitoring and observation even after fixation, with more sensitive detection than JC-1

Total ROS Detection

ROS Assay Kit -Highly Sensitive DCFH-DA-

Detection with higher sensitivity than the original DCFH-DA

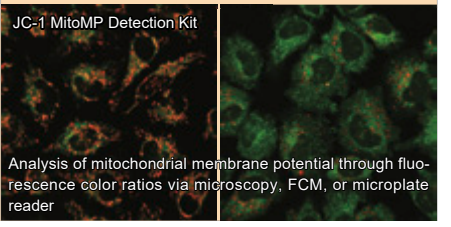
Mitochondrial Staining MitoBright LT Series (Green / Red / DeepRed)



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		
Extracellular OCR Plate Assay Kit	100 tests	E297-10
Glucose Assay Kit-WST	50 tests	G264-05
	200 tests	G264-20
Lactate Assay Kit-WST	50 tests	L256-10
	200 tests	L256-20
Mitochondrial Membrane Potential		
MT-1 MitoMP Detection Kit	1 set	MT13-10
JC-1 MitoMP Detection Kit	1 set	MT09-10
Mitophagy		
Mitophagy Detection Kit	1 set	MD01-10
Mtphagy Dye	5 µg × 3	MT02-10
Mitochondrial Staining		
MitoBright LT Green	400 µl	MT10-12
MitoBright LT Red	400 µl	MT11-12
MitoBright LT Deep Red	400 µl	MT12-12
MitoBright IM Red for Immunostaining	20 µl×1	MT15-10
	20 µl×3	MT15-12
Oxidative Stress		
MitoBright ROS Deep Red - Mitochondrial Superoxide Detection	100 nmol × 1	MT16-10
	100 nmol × 3	MT16-12
Mito-FerroGreen	1 set (50 µg × 2)	M489-10
Si-DMA for Mitochondrial Singlet Oxygen Imaging	2 µg	MT05-10
MitoPeDPP	5 µg × 3	M466-10

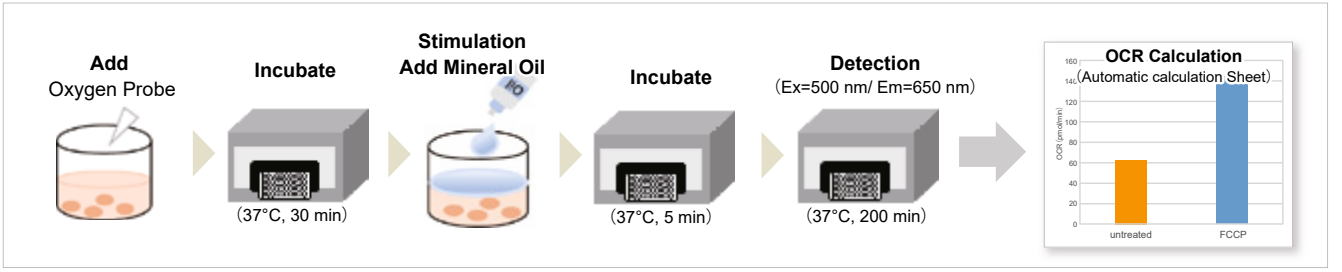
Mitochondrial Research

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

Kit Contents

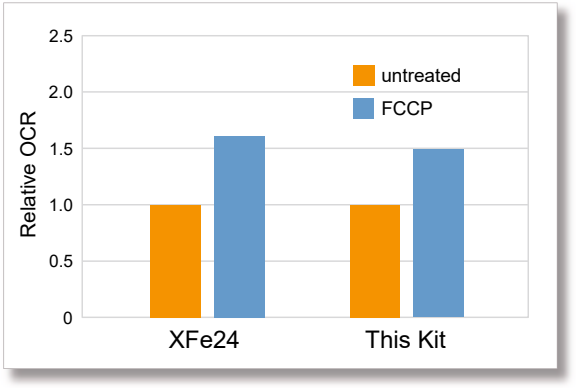
Procedure



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



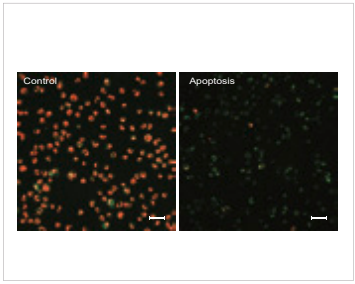
Description	Unit	Code
Extracellular OCR Plate Assay Kit	100 tests	E297-10

Mitochondrial Membrane Potential Detection

JC-1 MitoMP 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 a indicator of mitochondrial condition.

Fluorescence Microscope



Flow Cytometry

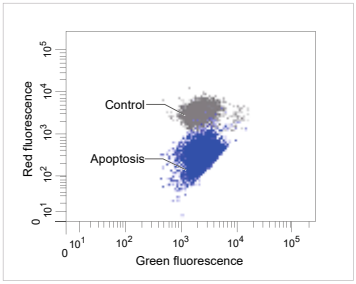
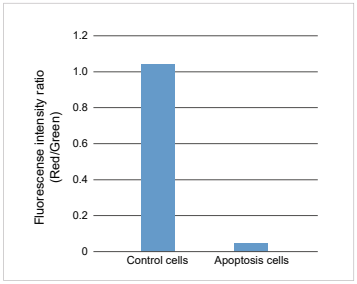


Plate Reader



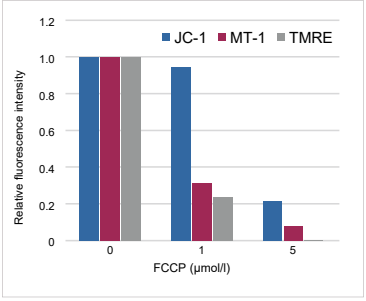
Description	Unit	Code
JC-1 MitoMP Detection Kit	1 set	MT09-10

Mitochondrial Membrane Potential Detection

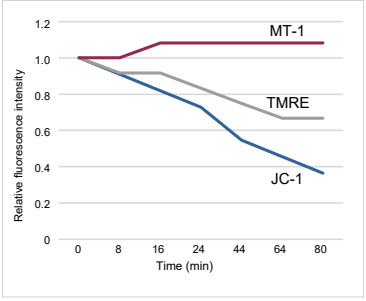
MT-1 MitoMP Detection Kit

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 MitoMP 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.

High Sensitivity Detection



Allow to monitor mitochondrial membrane potential

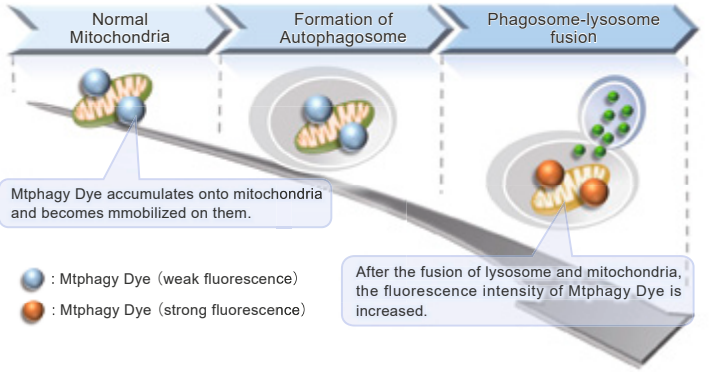


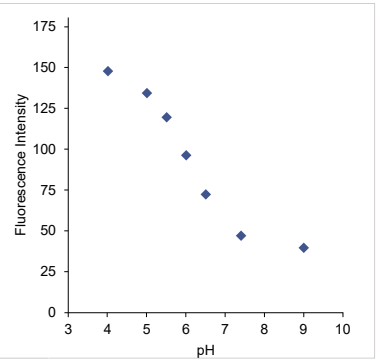
Description	Unit	Code
MT-1 MitoMP Detection Kit	1 set	MT13-10

Mitochondrial Research

Mitophagy Detection Kit

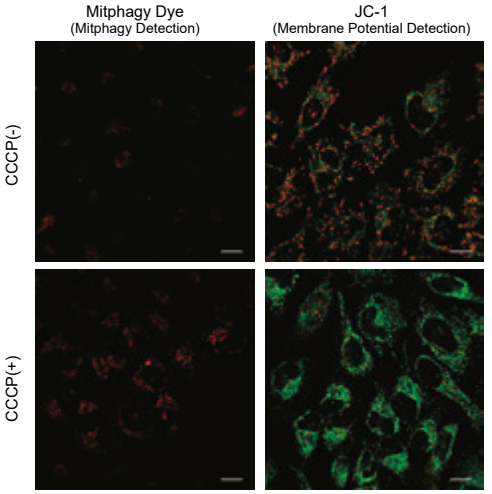
This kit is composed of Mtphagy Dye, reagent for detection of mitophagy, and Lyso Dye. Mtphagy Dye accumulates in intact mitochondria, is immobilized on it with chemical bond and exhibits a weak fluorescence from the influence of surrounding condition. When Mitophagy is induced, the damaged mitochondria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





The fluorescent intensity of Mtphagy Dye is incresased 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 Mtphagy Dye).

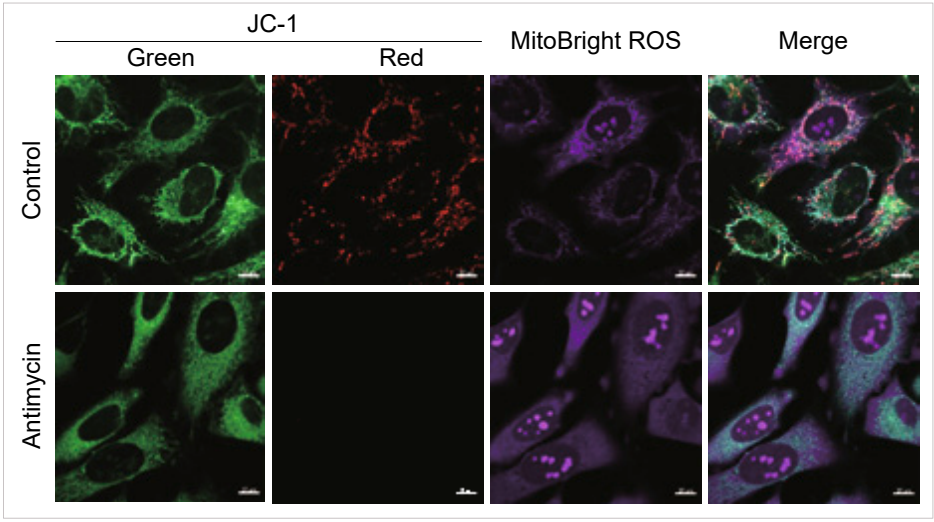
Description	Unit	Code
Mitophagy Detection Kit	1 set	MD01-10
Mtphagy Dye	5 µg × 3	MT02-10

MitoBright ROS Deep Red - Mitochondrial Superoxide Detection

This dye emits deep red fluorescence; its fluorescence does not overlap with emission wavelengths that other red fluorescent markers use. Furthermore, the MitoBright ROS Deep Red is better able to selectively detect superoxide, compared to Company T's product Red.

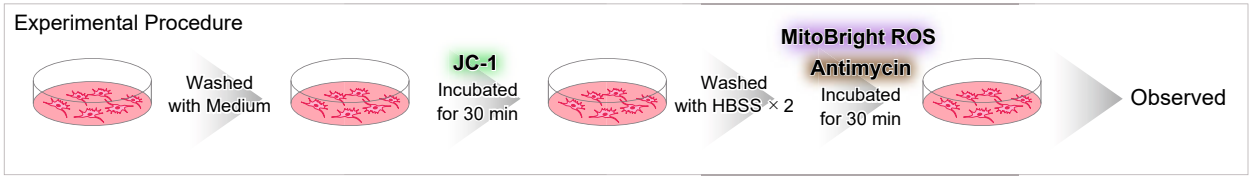
Experimental Example

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
MitoBright ROS Deep Red: Ex = 633 nm,
Em = 640-700 nm
Scale bar: 10 μm

After HeLa cells were washed with HBSS, co-stained with MitoBright ROS Deep Red and mitochondrial membrane potential staining dye (JC-1: code MT09), 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
MitoBright ROS Deep Red - Mitochondrial Superoxide Detection	100 nmol × 1	MT16-10
	100 nmol × 3	MT16-12

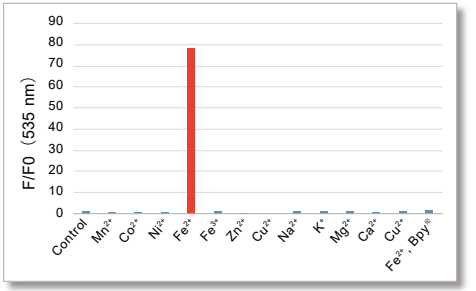
M489 F374

Mitochondrial Superoxide Detection

Mito-FerroGreen

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 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.

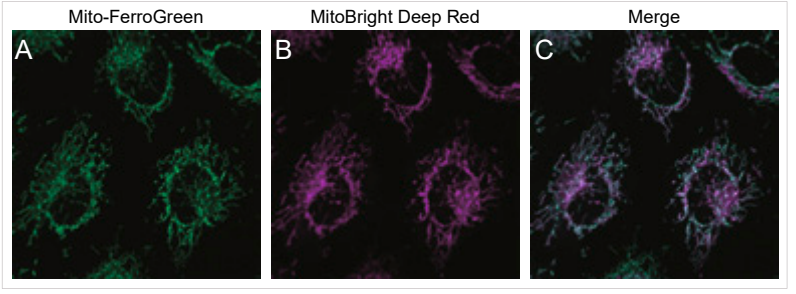
Metal ion Selectivity



※ Bpy : 2,2′ -Bipyridyl

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.



Double staining with mitocondrial staining probe

Mito-FerroGreen (5 μmol/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	λex 505 nm, λem 535 nm	λex 543 nm, λem 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 μmol/l)	1 tube (24 μg) 17 assays at 35 mm dish (final concentration 1 μmol/l)

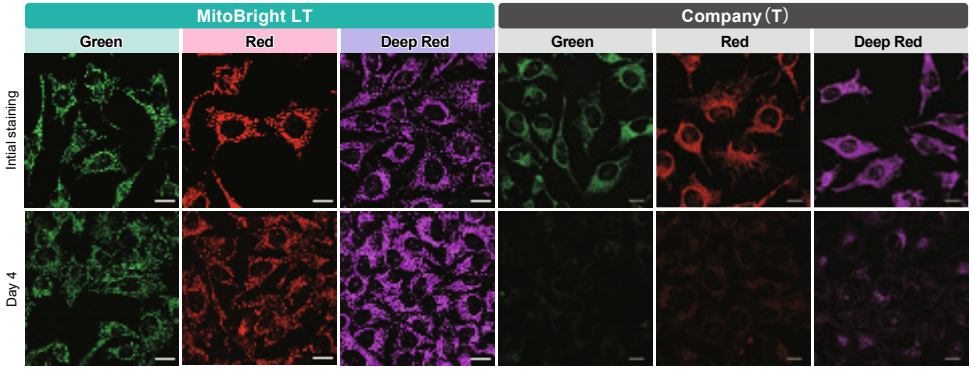
Description	Unit	Code
Mito-FerroGreen	1 set (50 μg × 2)	M489-10
FerroOrange	1 tube	F374-10
	3 tube	F374-12

MitoBright LT Series

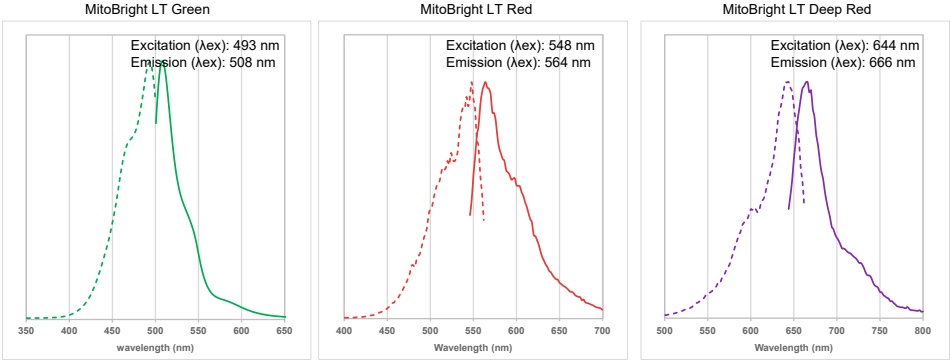
MitoBright LT dyes are designed to exhibit mitochondria retention for long-term visualization. In addition, the MitoBright LT dyes show stronger fluorescence signals compared with other commercially available dyes that contain the chloromethyl moiety. The MitoBright LT dyes offer three different color 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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