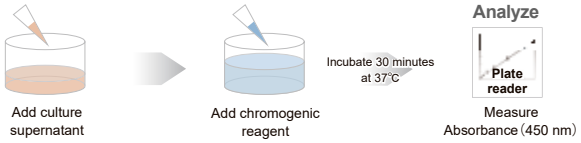
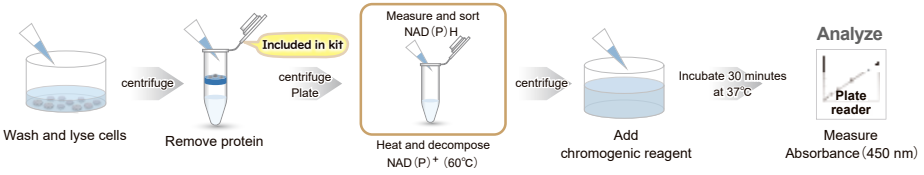
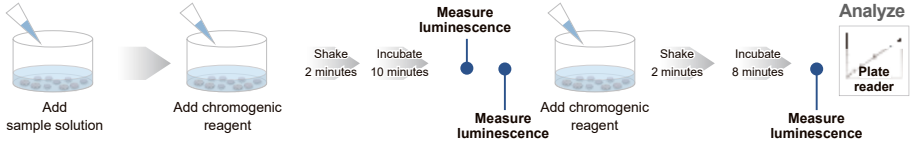
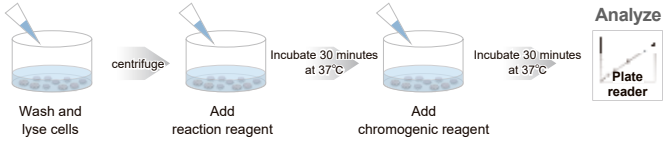
Measurements of Intracellular Metabolism

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

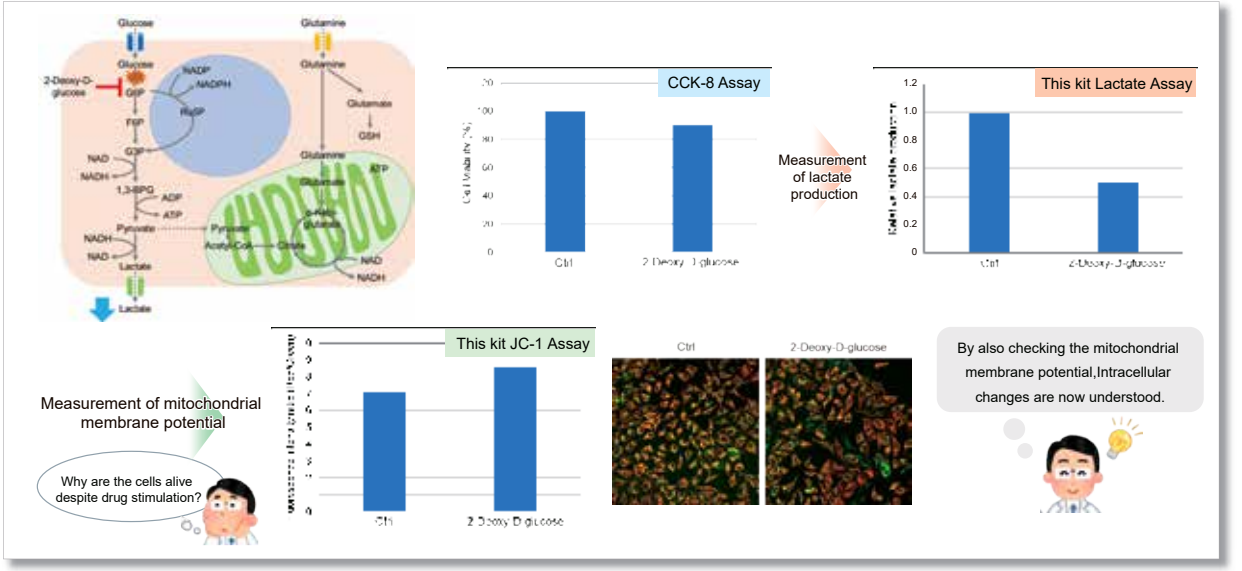
Intracellular metabolic changes caused by any stimulations can be detected by measuring lactate production and mitochondrial membrane potential. In certain instances, cells manage to survive despite sustaining damage to their glycolytic system or mitochondrial function, the principal pathways for energy 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.

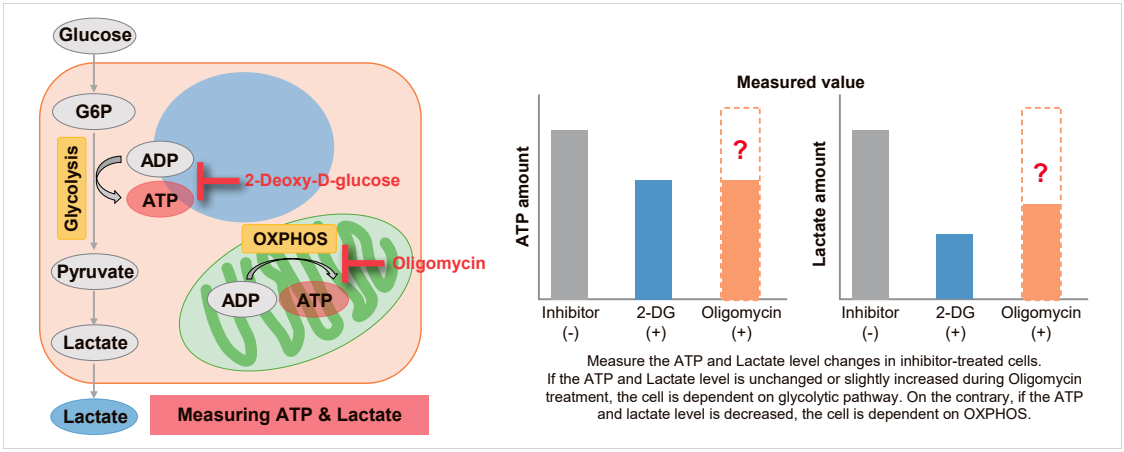


Description	Unit	Code
Glycolysis/JC-1 MitoMP Assay Kit	50 tests	G272-10

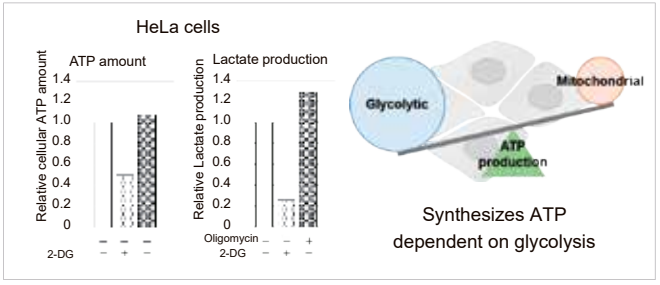
Glycolysis/OXPHOS Assay Kit

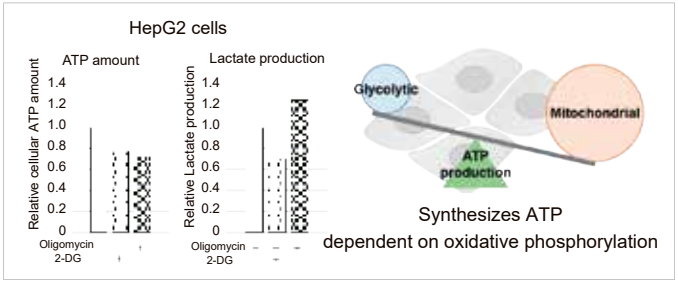
- Easy test via plate reader, no need for expensive equipment
- All reagent acquired is included, ready to use kit
- Easy-to-understand detailed protocol

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



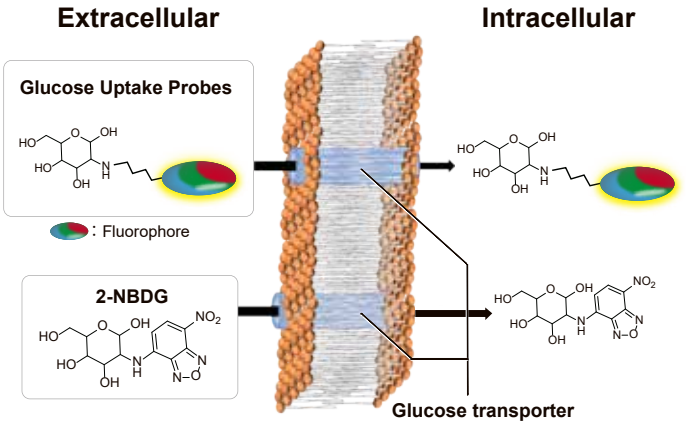


Description	Unit	Code
Glycolysis/OXPHOS Assay Kit	50 tests	G270-10

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 *	λ_{ex}:386 nm λ_{em}:474 nm
Glucose Uptake Assay Kit-Green	○	○	○	1 hour *	λ_{ex}:507 nm λ_{em}:518 nm
Glucose Uptake Assay Kit-Red	○	○	○	1 hour *	λ_{ex}:560 nm λ_{em}:572 nm
2-NBDG	○	×	○	30 minutes or less *	λ_{ex}:465 nm λ_{em}:540 nm

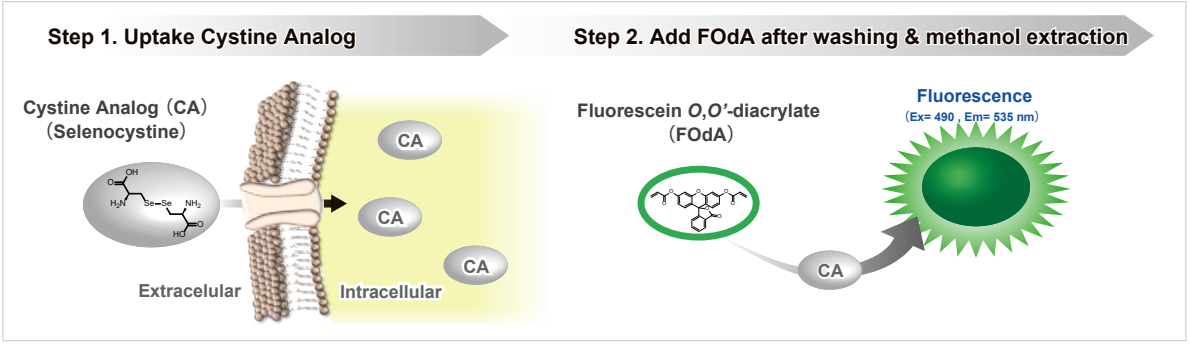
*Result of A549 cells, the retention time for other cell lines may be different.

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

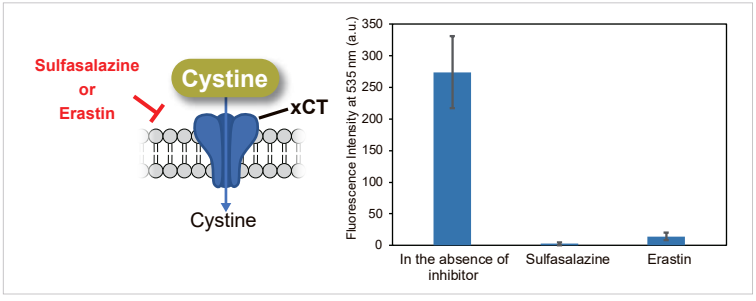
- Easier way to cystine uptake assay
- Applied for plate assay

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