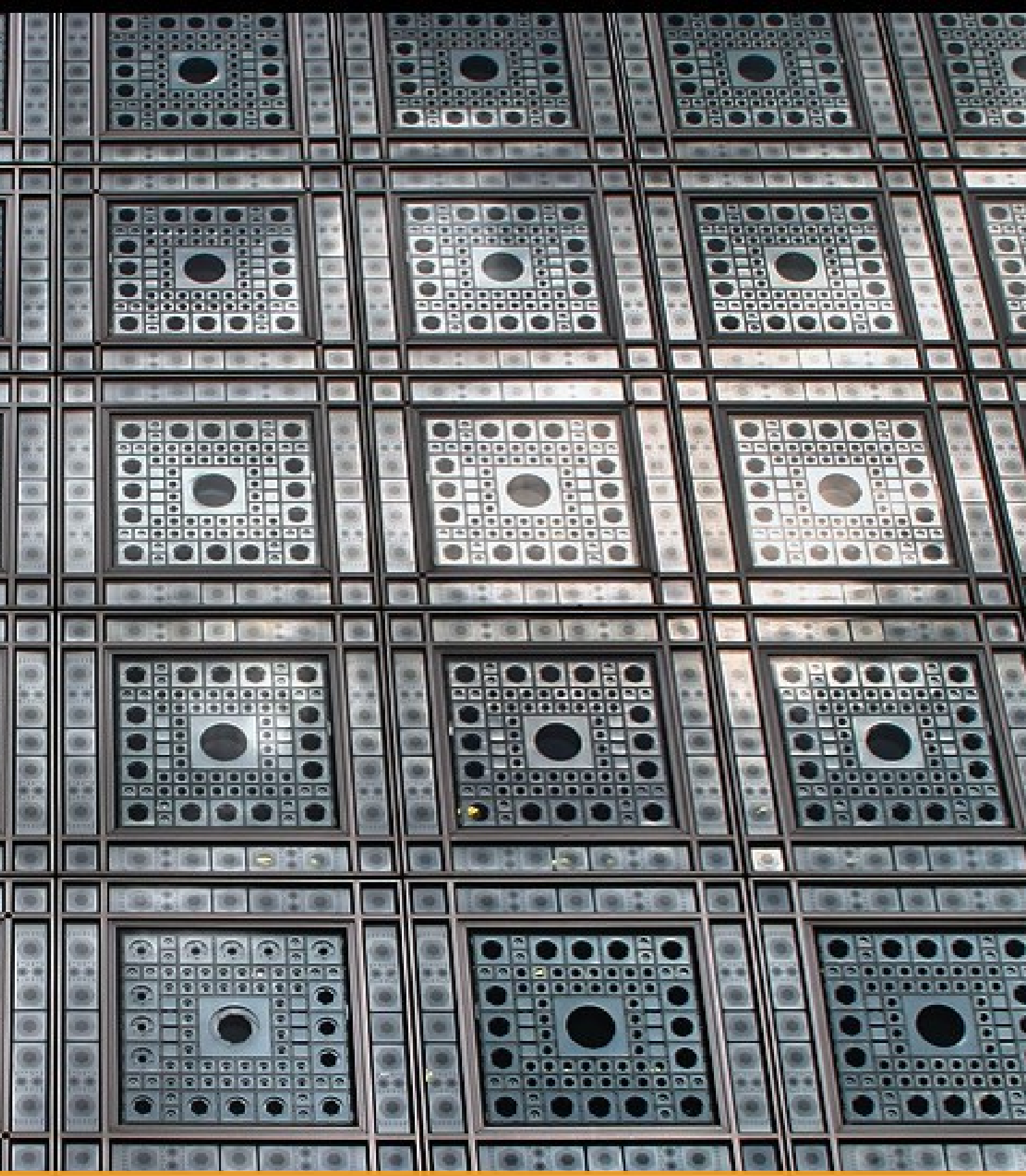


Cell Culture & Assays

8

CELL CULTURE

ANTIBIOTICS & SUPPLEMENTS

Most used antibiotics and supplements required in cell culture labs are supplied in Cell Culture Grade.

Antibiotic-Antimycotic Solution, 100x

Antimycotic Solution is an antibiotic mixture of penicillin (10-12,000 U/mL), streptomycin (10-12 mg/ mL) and amphotericin B (> 25 µg/ mL) that offer a broad efficacy spectrum (gram-positive, gram-negative bacteria, yeast and fungi). Penicillin is a typical β-lactam antibiotic that inhibits bacterial peptidoglycan cell wall synthesis. In other hand, streptomycin acts by binding to the 30S subunit of the bacterial ribosome causing protein synthesis inhibition and death, while amphotericin B interferes with fungal membrane permeability by forming channels in the membranes and causing small molecules to leak out.

REFERENCES	DESCRIPTION	FORMAT
TBR0328	ANTIBIOTIC-ANTIMYCOTIC SOLUTION 100X	100 mL

Penicillin-Streptomycin Solution, 100x

Penicillin-Streptomycin Solution is a sterile antibiotic mixture of penicillin (10-12,000 U/mL) and streptomycin (10-12 mg/ mL) useful to control bacterial contamination in vitro. Antibiotic dual action is effective against gram-positive and gram-negative bacteria.

REFERENCES	DESCRIPTION	FORMAT
TBR0325	PENICILLIN-STREPTOMYCIN SOLUTION 100X	100 mL

TIARIS™ Mycoplasma Removal Reagent, 50x

TIARIS™ Mycoplasma Removal Agent, 50x is an antibiotic solution based on a derivative of the quinoline. It is a highly effective against multiple mycoplasma species. Mycoplasma is the predominant contaminant in cell cultures, posing challenges in detecting pollutants due to interference with experimental results. Cell culture mycoplasma contamination is estimated to occur in approximately 30.3% to 50.5% of cases. Quinoline compound eliminates mycoplasma infection by inhibiting mycoplasma DNA gyrase.

REFERENCES	DESCRIPTION	FORMAT
TBR0332	TIARIS™ MYCOPLASMA REMOVAL REAGENT 50X	100 mL

G-418 Sulphate Solution

G-418 Sulfate Solution is an aqueous solution of G-418 sulfate at 50 mg/ mL. This antibiotic, isolated in 1974 from *Micromonospora rhodorangea*, belongs to the group of aminoglycoside antibiotics, It is widely used in molecular and cell biology experiments. Its mechanism of action is based on blocking polypeptide synthesis by inhibiting the elongation step in both prokaryotic and eukaryotic cells. Resistance to G-418 is conferred by the neo gene, located on both transposons Tn5 and Tn601 (903). They have been included in some plasmids as selective genes.

REFERENCES	DESCRIPTION	FORMAT
TBR0334	G-418 SULPHATE SOLUTION, 200 mg/mL	10 mL

L-Glutamine, 100x

L-Glutamine 100x is a concentrated sterile solution of the essential amino acid L-glutamine, used as a supplement in cell culture medium. It plays a key role in cellular metabolism, serving as a major source of nitrogen and carbon, which are essential for synthesizing proteins, nucleotides, and other molecules required for cell proliferation. In addition, L-glutamine is critical for maintaining cell viability, especially in fast-growing cells. The concentration of L-glutamine needed varies depending on the cell type and medium formulation; in specialized media, such as serum-free or protein-free formulations, L-glutamine is often supplemented at levels around 2.5 mM to 6 mM.

REFERENCES	DESCRIPTION	FORMAT
TBR0320	L-GLUTAMINE, 100X	100 mL

L-Alanyl-L-Glutamine (*stable glutamine*), 200 mM

L-Alanyl-L-Glutamine 100x is a concentrated sterile solution of stable L-glutamine, used as a supplement in cell culture medium. The dipeptide is metabolized within the cells to yield L-Glutamine plus the second amino acid. This results in a more consistent delivery of L-Glutamine to cells and avoids toxic build-up of ammonia in cell cultures. This feature can be especially important for ammonia-sensitive cell lines.

L-Alanyl-L-Glutamine prevents the intramolecular cyclization reaction associated with solutions of L-Glutamine, allowing the formulation of cell culture media containing L-Glutamine that may be stored at 4°C for extended periods. Solutions containing these derivatives can even be autoclaved without appreciable degradation of the product (30 minutes at 121°C results in <5% loss of the product).

REFERENCES	DESCRIPTION	FORMAT
TBR0322	L-ALANYL-L-GLUTAMINE (STABLE L-GLN), 200 mM	100 mL

CELL CULTURE GRADE BUFFERS

Most used antibiotics and supplements required in cell culture labs are supplied in Cell Culture Grade.

HEPES Buffer 1 M

HEPES Buffer Solution (1M) is widely used as a buffering agent in cell culture media. The zwitterion possesses a pKa(1) of 3 and a pKa(2) of 7.5 with useful pH ranges of 2.5-3.5 and 6.7-8.6. In comparison with bicarbonate buffer systems, HEPES is better in maintaining physiological pH despite changes in CO_2 concentrations resulting from cellular activity. HEPES is suitable for many cell culture systems as it is membrane impermeable and has limited effect on biochemical reactions.

REFERENCES	DESCRIPTION	FORMAT
TBB0387	HEPES BUFFER 1 M	100 mL

DPBS 1x, *without calcium and magnesium*

Dulbecco Phosphate Buffer Saline (DPBS) 1x is a chemically defined balanced salt solution used for a variety of laboratory procedures such as: cell culture applications maintaining osmotic stability in a physiological pH range; immunoassays and immunohistochemical techniques; storage and transporting of biological samples.

REFERENCES	DESCRIPTION	FORMAT
TBB0404	DPBS 1X, WITHOUT CALCIUM AND MAGNESIUM	100 mL

VIABILITY INDICATORS

Trypan Blue Cell Viability Indicator

Trypan Blue Cell Viability Indicator is a highly used solution to test cell viability routinely. This large negatively charged molecule is excluded by cells which have intact cell membranes, while it can penetrate cells with a damaged membrane. The assay, based on the dye exclusion, allows to differentiate living cells (*bright*) from dead cells (*blue*) under the microscope.

Erythrosin Cell Viability Indicator

Erythrosin Cell Viability Indicator is a non-toxic solution used to test cell viability. Safer than trypan dye, this molecule is excluded by cells which have intact cell membranes, while it can penetrate cells with a damaged membrane. The assay allows to differentiate living cells (*bright*) from dead cells (*pink*) under the microscope.

CELL DETACHMENT

Trypsin-EDTA

Trypsin-EDTA is a well-known solution used as standard solution to detach cells from standard tissue culture plastic ware and adhesion coated plastic ware. It contains pancreatic porcine trypsin at 0.05% (1x) or 0.5% (10x) in Dulbecco´s PBS pH=7.3 ± 0.3. Trypsin is a serine protease that hydrolyzes proteins at the carboxyl side of the Lysine or Arginine. EDTA presence enhances trypsin action, and reduces the required trypsin concentration for effective hydrolysis. The solution does not include calcium and magnesium.

Trypsin-EDTA is used to dissociate adherent cells from surfaces, routine cell passage and to create single cell suspension for accurate cell counting.

Accutase®

Accutase® is an enzymatic mixture with protease and collagenase activity used as routine cell detachment solution. It allows a more gentle treatment of adherent cells than trypsin to detach cells from standard tissue culture plastic ware and adhesion coated plastic ware, and polymer. Cells detached by Accutase® are suitable for analysis of cell surface biomarkers, flow cytometry of receptors or extracellular epitopes, assays of cell proliferation, virus growth assay, quiescence assays by serum starvation, transformation assays by oncogene transfection, etc.

REFERENCES	DESCRIPTION	FORMAT
TBB0402	TRYPAN BLUE CELL VIABILITY INDICATOR	100 mL
TBB0403	TRYPAN BLUE CELL VIABILITY INDICATOR	5 x 1.5 mL
TBB0413	ERYTHROSIN CELL VIABILITY INDICATOR	100 mL
TBB0413	ERYTHROSIN CELL VIABILITY INDICATOR	5 x 1.5 mL
TBZ0340	ACCUTASE®	100 mL
TBZ0342	TRYPSIN-EDTA IN DPBS, 0.05% (1X)	100 mL
TBZ0344	TRYPSIN-EDTA IN DPBS, 0.5% (10X)	100 mL

TRANSFECTION REAGENTS

Tiaris™ Cell Transfection Kit | *Cationic Polymer*

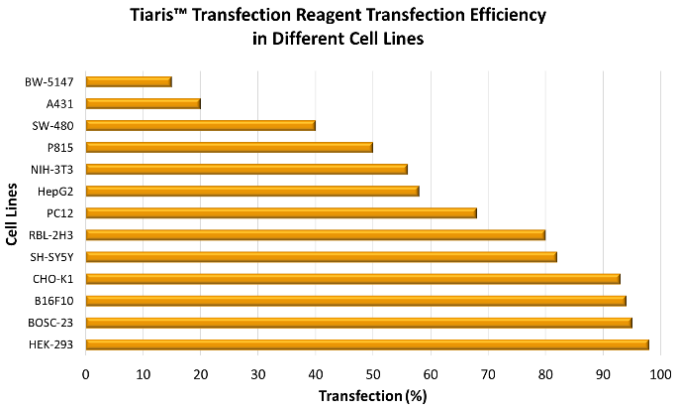
Tiaris™ Cell Transfection Kit is an effective kit that includes a highly charged cationic polymer able to bind anionic nucleic acids and a plasmid control with green fluorescent protein as reporter of transfection performance. The included, Tiaris™ Transfection Reagent, is based on a new formulation that inhibits lysosomal nuclease activity and increases transfection efficiency. It provides stoutly results in a wide variety of laboratory cell lines, making it an excellent choice for everyday use.

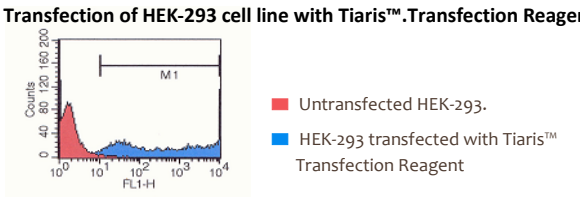
Features

- High transfection efficiency in the most common cell lines.
- Tiaris™ Transfection Reagent is serum resistant.
- Easy protocol and reproducible results.
- Low cytotoxicity.

Applications

- Stable and transient transfection of viral and non-viral plasmid vectors.
- Co-transfection of different vectors to obtain viral supernatants.
- Transfected cells are suitable for all downstream cellular applications.
- High-throughput transfection.





LipoCore™ Transfection Reagent | *Cationic Lipid*

Kit based on the high performance of the LipoCore™ cationic lipid formulation with optimal balance of cationic charge and hydrophobic lipidic groups. Suitable kit to for the transfection of plasmid DNA, siRNA, miRNA or mRNA with low cytotoxicity and useful in cell lines, primary and stem cells.

Features

- High transfection efficiency in cell lines, primary and stem cells.
- Serum resistant.
- Low cytotoxicity.

Applications

- Transfection of plasmid DNA.
- Transfection of siRNA, miRNA and mRNA.

REFERENCES	DESCRIPTION	FORMAT
TBK0551	TIARIS™ CELL TRANSFECTION KIT	1 mL
TBK0552	TIARIS™ CELL TRANSFECTION KIT	5 x 1 mL
TBR0338	LIPOCORE™ TRANSFECTION REAGENT	1 mL

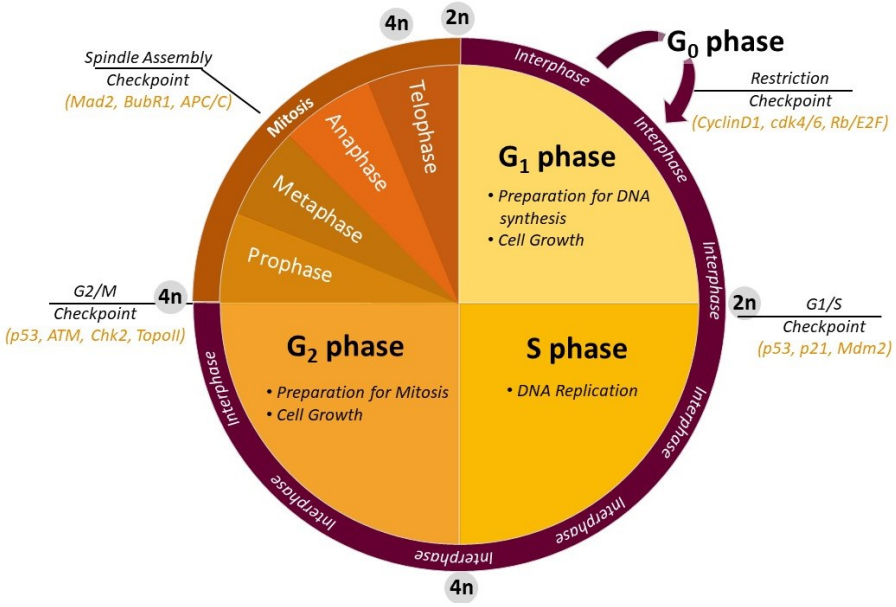
CELL ASSAYS

Assay Selection Guide

	CELL CYCLE	CELL VIABILITY	CYTOTOXICITY	PROLIFERATION	APOPTOSIS	OXIDATIVE STRESS	β-GAL REPORTER ASSAY	LUCIFERASE REPORTER	SEAP REPORTER
Propidium Iodide Cell Cycle Analysis Kit *(TBK0554)*	F								
Trypan Blue Cell Viability Indicator Kit *(TBB0402-0403)*		✓	✓						
Erythrosin Cell Viability Indicator *(TBB0413-0414)*		✓	✓						
LDH Cytotoxicity Assay Kit *(TBK0521-0522)*		C	C		C				
SRB Cytotoxicity Assay Kit *(TBK0518)*		C	C						
Resazurin Cell Viability Assay *(TBK0506-0507)*		F	F						
XTT Viability & Proliferation Assay *(TBK0501-0502)*		C	C	C					
Annexin V-FITC Apoptosis Detection Kit *(TBK0508-0509)*					F				
Annexin V-APC Apoptosis Detection Kit *(TBK0510-0511)*					F				
Annexin V-Biotin Apoptosis Detection Kit *(TBK0512-0513)*					F				
Annexin V-PE Apoptosis Detection Kit *(TBK0514-0515)*					F				
Superoxide Dismutase Assay Kit *(TBK0527)*						C			
ROS Detection Assay Kit *(TBK0530)*						F			
ONPG β-Galactosidase Assay Kit *(TBK0543)*							C		
FDG β-Galactosidase Assay Kit *(TBK0543)*							F		
Firefly Luciferase Detection Kit *(TBK0546, TBK0547)*								L	
SEAP Reporter Gene Assay Kit *(TBK0537)*									L

ASSAY READOUT C *Colorimetric* F *Fluorescence* L *Luminiscence*

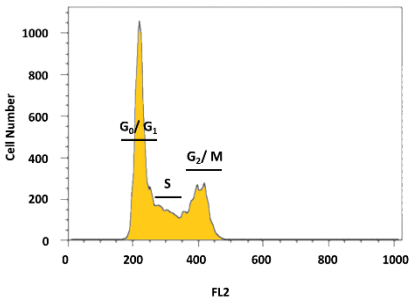
CELL CYCLE ANALYSIS



Propidium Iodide Cell Cycle Analysis Kit

This kit offers a rapid and reliable tool for analyzing the distribution of cells in various cell cycle stages. Using propidium iodide, a nuclear dye that binds to cellular nucleic acids, the kit generates fluorescence signals proportional to the DNA content, enabling the quantification of cells in the G0/G1, S, and G2/M phases through flow cytometry.

The cell cycle is a universal and intricate process governing cell growth and proliferation, tightly regulated due to its crucial roles in development, DNA damage repair, and overall cellular health. Disruptions in the cell cycle can result in conditions like tissue hyperplasia and diseases such as cancer. Understanding and monitoring the cell cycle are essential for studying cellular development, disease progression, and therapeutic evaluation.



Features

- Quick, precise and efficient method to detect the number of cells in a cell population.
- **Highly sensitive method** to detect and monitor cells at various stages of the cell cycle.
- **Fluorescent readout**.
- Well-suited for **high throughput analysis**.

Applications

- Detection and monitoring cells at various stages of the cell cycle.
- Screening of compounds that affect cell growth and division.

REFERENCES	DESCRIPTION	FORMAT
TBK0554	PROPIDIUM IODIDE CELL CYCLE ANALYSIS KIT	200 reactions

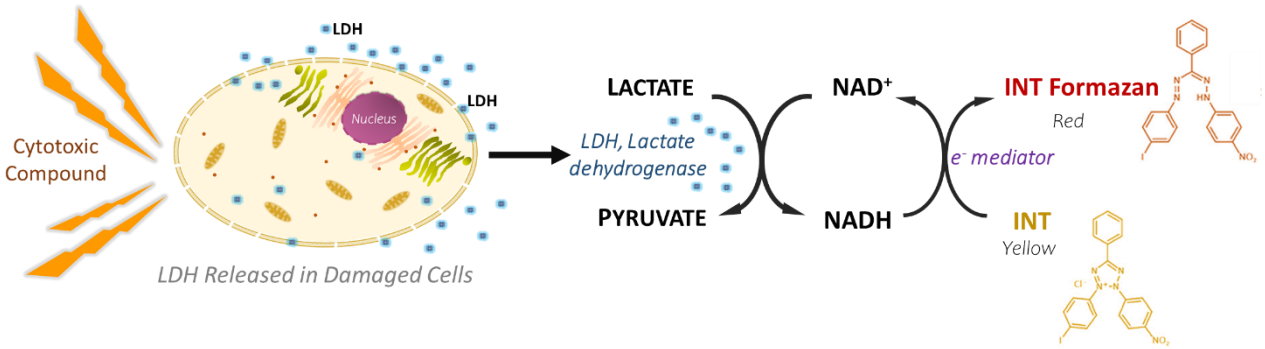
CYTOTOXICITY ASSAYS

Most used antibiotics and supplements required in cell culture labs are supplied in cell culture grade.

LDH Assay

LDH Cytotoxicity Assay Kit is a robust kit to measure cell death or cytotoxicity in cell culture experiments through lactate dehydrogenase (LDH) activity. LDH is a cytosolic enzyme that is rapidly released into the cell medium after damage of cell membrane. The amount of LDH released is proportional to the number of cells undergoing necrosis, apoptosis, or other forms of cell death, as well as from damaged or stressed cells.

LDH activity determination is based on the reduction of the tetrazolium salt, iodonitrotetrazolium chloride (INT). INT is reduced by LDH in the supernatant to form a colored formazan product that can be quantified spectrophotometrically at 490 nm.



Features

- **Non-radioactive assay**, is safer alternative to $_{51}$Cr assay.
- **Accurate**, simple and reproducible assay.
- Ideal for **high throughput screening**.
- Measurement **can be performed directly in the culture medium** without solubilization process.
- **Highly sensitive**, with a limit of detection of 1-10 ng/mL of LDH.
- Suitable **assay for both adherent and non-adherent cells**.

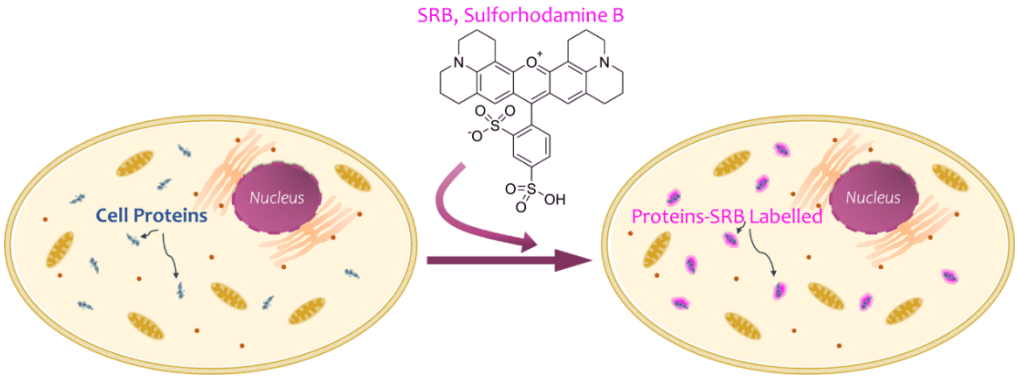
Applications

- For assessing induced cytotoxicity of drugs/ pollutants/ test compounds.
- To assess the cytotoxicity of immune cells (NK, T lymphocytes, etc) or viruses against target cells.
- To evaluate the invasiveness of cancer cells.
- Antibody-dependent cell-mediated cytotoxicity.
- Cell death, cell viability or cell proliferation measure.

REFERENCES	DESCRIPTION	FORMAT
TBK0521	LDH CYTOTOXICITY ASSAY KIT	400 assays
TBK0522	LDH CYTOTOXICITY ASSAY KIT	1,000 assays

SRB Assay

SRB Cytotoxicity Assay Kit is an excellent and efficient assay to evaluate cytotoxicity and cell viability. It is based in the staining of cellular proteins with the bright pink aminoxanthane dye, sulforhodamine B (SRB). SRB forms an electrostatic complex with basic amino acid residues in labeling acidic conditions, but it can dissociate under solubilization basic conditions.



The binding of SRB is stochiometric. The incorporated dye solubilized is directly proportional to the cell number. The assay readout is colorimetric at 540 nm with a reference at 690 nm.

Features

- **Accurate, simple and reproducible**.
- **Highly sensitive,** 1-200% of cell confluence is in a linear range with cell number and protein concentration.
- **Sensitivity comparable with fluorometric assays** and better and superior to Lowry or Bradford.
- **Excellent signal to noise ratio** and the resolution is 1000-2000 cells/ well.
- **Suitable for high throughput format**.
- Cell labelling is **not cell line depending**.

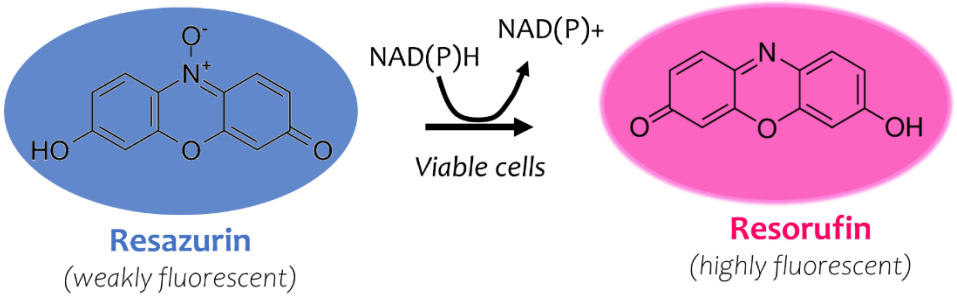
Applications

- Cell viability determination.
- Cytotoxicity.
- Drug toxicity screening.

REFERENCES	DESCRIPTION	FORMAT
TBK0518	SRB CYTOTOXICITY ASSAY KIT	1000 assays

Resazurin Assay

Resazurin Viability Assay Kit is a rapid and highly robust kit to measure cellular viability. It is based on the reduction of weakly fluorescent blue resazurin to a pink fluorescent resorufin by oxidoreductases of viable cells. Resazurin is a permeable dye and the reaction is produced at mitochondria organelle. The production of resorufin is proportional to the number of living cells.



Features

- **Ready to use solution,** to monitor cell viability.
- **Highly sensitive,** 50 – 50000 cells in a linear range could be measured in fluorescent readout.
- **Suitable for high throughput format,** homogeneous assay without washing steps.
- **Versatile,** fluorescent or colorimetric readout.
- **Not require radioactive materials,** cell fixation, or cell permeabilization.

Applications

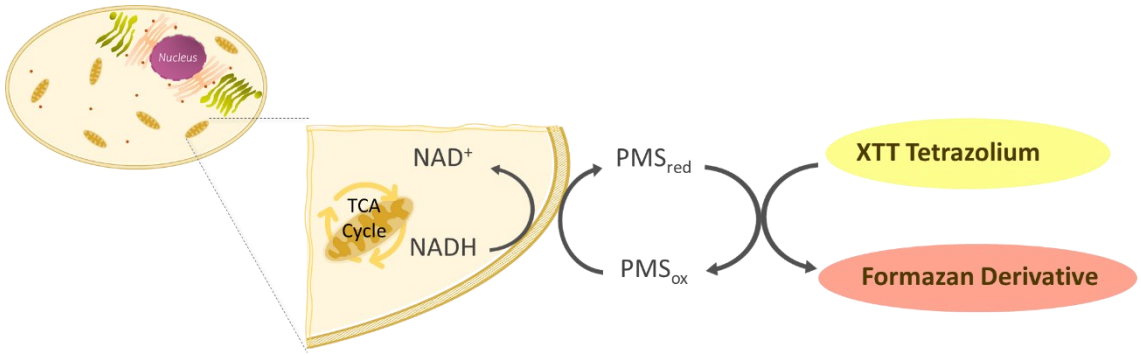
- Determination of cell viability in presence of different agents.
- Bacterial contamination in milk.
- Sperm viability.
- Mitochondrial activity.

REFERENCES	DESCRIPTION	FORMAT
TBK0506	RESAZURIN CELL VIABILITY ASSAY	2500 assays
TBK0507	RESAZURIN CELL VIABILITY ASSAY	10000 assays

PROLIFERATION ASSAYS

XTT Assay

XTT Assay is a colorimetric assay widely used to measure cellular viability, proliferation and cytotoxicity. It is based on the reduction of a yellow XTT tetrazolium salt to an orange soluble formazan derivative by the succinate dehydrogenase system of the mitochondrial respiratory chain. The intensity of formazan dye is proportional to the number of living cells.



Features

- **Improved efficiency**, with the addition of Activation Reagent as electron coupling in the reaction.
- **Higher accuracy**, based in the solubility of formazan derivative produced.
- **Highly sensitive**, low number of living cells could be measured.
- **Suitable for high throughput format**, homogeneous assay without washing steps.
- **Versatile**, valid for adherent and suspension cells.
- **Safe**, not require radioactive materials.

Applications

- Determination of cell viability in presence of different agents.
- Cell proliferation.
- Cytotoxicity assays.

REFERENCES	DESCRIPTION	FORMAT
TBK0501	XTT VIABILITY & PROLIFERATION ASSAY KIT	200 assays
TBK0502	XTT VIABILITY & PROLIFERATION ASSAY KIT	1,000 assays

Complementary Products

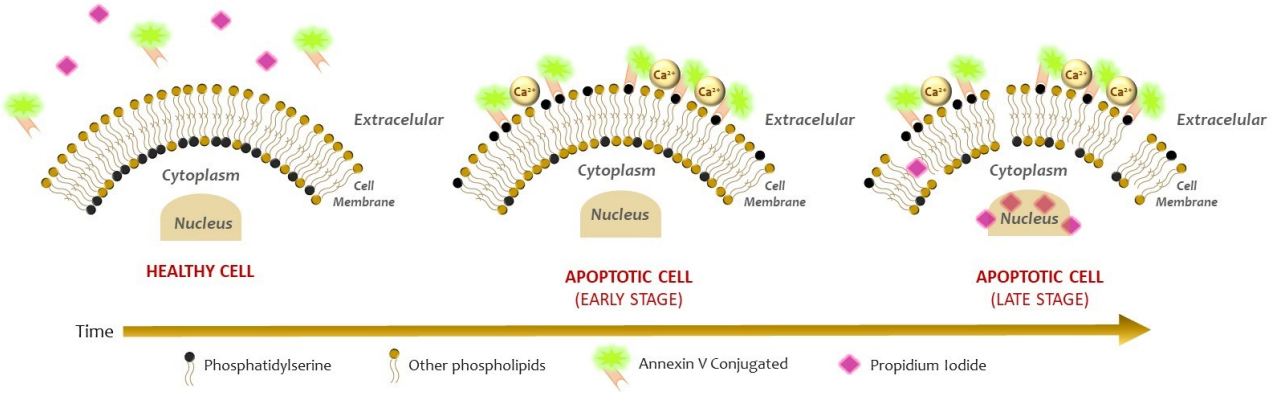
✓ **Trypan Blue Cell Viability Indicator** *(TBB0402-3)*

APOPTOSIS ASSAYS

Annexin Assays

Annexin V Apoptosis Detection Kits are an effective kits designed to dual detection of apoptotic stage: collapse of asymmetrical distribution of phosphatidylserine (PS) and destabilization of membrane integrity. Annexin V binds with high affinity to PS (Kd ~ 5×10^{-2}) in Ca^{2+} presence and this binding is detected by its fluorochrome (*FITC, PE, APC*) or molecule (*biotin*) conjugated.

Healthy cells will be negative for Annexin V and propidium Iodide staining; early-stage apoptotic cells will be positive for Annexin V while late-stage apoptotic cells or necrotic cells will be positive for both markers. Propidium iodide only can enter into late apoptotic or necrotic cells, to bind to DNA.



Features

- **Earlier Apoptosis Detection** than DNA-based assays.
- **Versatile**, suitable for adhesion and suspension cells.

Applications

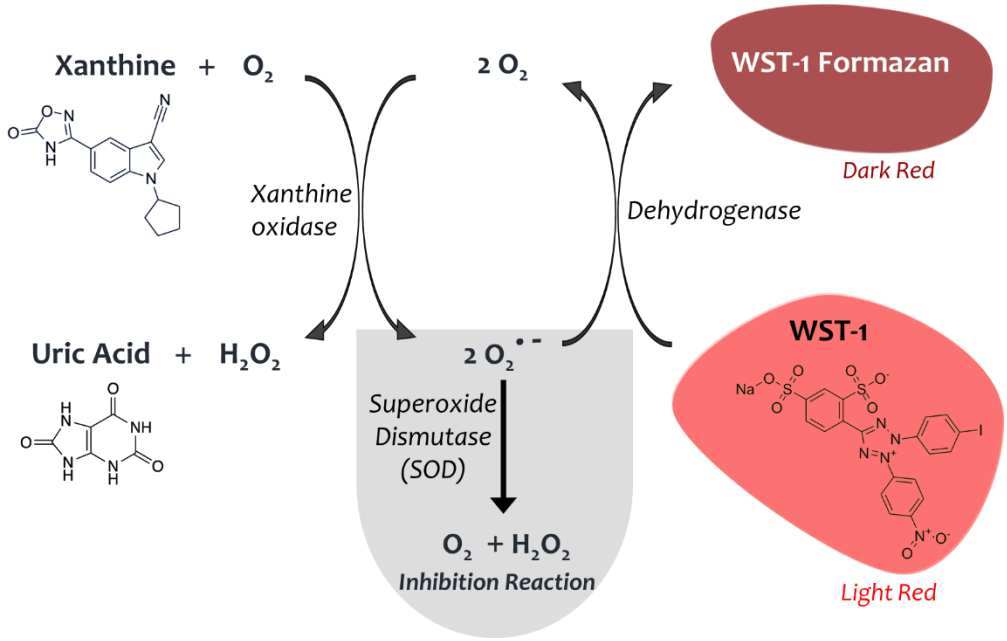
- Dual detection of early- and late-stage cell apoptosis.
- Differentiation of apoptosis and necrosis cells.

REFERENCES	DESCRIPTION	FORMAT
TBK0508	ANNEXIN V-FITC APOPTOSIS DETECTION KIT	20 assays
TBK0509		100 assays
TBK0510	ANNEXIN V-APC APOPTOSIS DETECTION KIT	20 assays
TBK0511		100 assays
TBK0512	ANNEXIN V-BIOTIN APOPTOSIS DETECTION KIT	20 assays
TBK0513		100 assays
TBK0514	ANNEXIN V-PE APOPTOSIS DETECTION KIT	20 assays
TBK0515		100 assays

OXIDATIVE STRESS ASSAYS

SOD, Superoxide Dismutase Assay

Superoxide Dismutase Assay Kit is an excellent and efficient assay to detect superoxide dismutase (SOD) activity. SOD catalyzes the conversion of superoxide radicals into hydrogen peroxide and oxygen. Superoxide Dismutase Assay Kit is based on WST-1 tetrazolium salt and in the use of xanthine oxidase to generate superoxide radicals. WST-1 is converted into a water-soluble formazan dye by cellular dehydrogenases. The presence of SOD reduces the amount of WST-1 formazan produced. The rate of WST-1 reduction by superoxide anion is linearly related to the xanthine oxidase activity and the inhibition by SOD.



Features

- **Accurate, simple and reproducible assay**, around 3.2% inter- and intra- assay coefficient of variation.
- **Wide dynamic range**, linearity from 0.005 to 0.5 U SOD/ mL.
- Colorimetric readout at 450 nm.
- **Highly sensitive** for measure SOD activity in plasma, serum, urine, saliva, tissues, cells, etc.

Applications

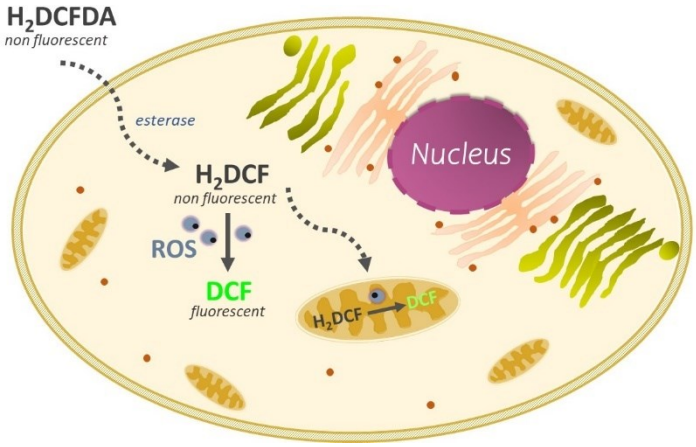
- Role of SOD in physiological processes such as aging, oxidative stress, inflammation, cellular signaling, etc.
- Antioxidant therapies effectiveness.
- Analysis of environmental stressors.

REFERENCES	DESCRIPTION	FORMAT
TBK0527	SUPEROXIDE DISMUTASE ASSAY KIT	100 assays

ROS Assay

ROS Detection Assay Kit is a widely used kit designed to detect reactive oxygen species (ROS), highly reactive molecules containing oxygen such as free radicals like superoxide anions ($O_2 \bullet^-$), hydroxyl radical ($HO \bullet$) and non-radical compounds like hydrogen peroxide (H_2O_2). ROS are expressed in various cellular compartments including peroxisomes, mitochondria and endoplasmic reticulum. These molecules play essential roles in cell signaling and homeostasis but can cause oxidative stress when present in excess, leading to cellular damage.

ROS Detection Assay Kit is based on the use of the fluorogenic substrate H2DCFDA. H2DCFDA is a cell-permeable, non-fluorescent compound that, once inside the cell, is deacetylated by intracellular esterases to H2DCF. In the presence of ROS, H2DCF is then oxidized to the highly fluorescent compound DCF (*dichlorofluorescein*). The intensity of DCF fluorescence can be measured providing a reliable indicator of intracellular ROS levels.



Features

- **Highly sensitive assay.**
- Mainly ROS compounds detected are **hydrogen peroxide** (H_2O_2), **hydroxyl radicals** ($HO \bullet$), and **peroxynitrite ($ONOO^-$).**
- **Fluorometric** readout (Ex/ Em = 485/ 530 nm).
- **Safe detection**, non-radioactive compounds.
- **High throughput**.
- **Versatile,** suitable for adherent and suspension cells.

Applications

- Measurement of intracellular levels of ROS.
- Fluorescence microscopy (*TRITC/ FITC channel*).
- Flow Cytometry (*FL1 channel*).

REFERENCES	DESCRIPTION	FORMAT
TBK0530	ROS DETECTION ASSAY KIT	500 assays

Reactive Oxygen Species

Free Radicals

- Alkoxyl, $RO \bullet$
- Carbonate, CO_3^-
- Carbon Dioxide, CO_2^-
- Hydroperoxyl, $HO \bullet$
- Hydroxyl, $OH \bullet$
- Peroxyl, $RO_2 \bullet$
- Superoxide, O_2^-

Non-Radical

- Hydrogen Peroxide, H_2O_2
- Hypobromous Acid, HOBr
- Hypochlorous Acid, HOCl
- Organic Peroxides, ROOH
- Ozone, O_3
- Peroxynitrite, $ONOO^-$
- Peroxynitrous Acid, ONOOH

GENE REPORTER ASSAYS

Gene reporter assay are very useful assays with applications in :

- Normalization of transfection efficiency in mammalian cells.
- Study of protein trafficking, strength of promoters and enhancer with β-galactosidase as reporter.
- Protein-protein interaction studies.

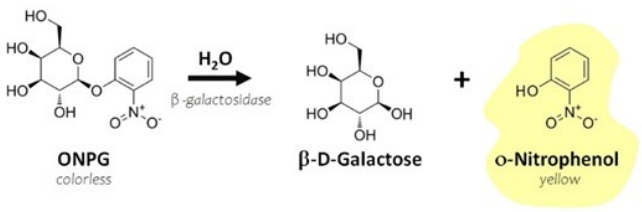
β-Galactosidase Detection

lacZ, the gene coding β-galactosidase, is one of the most notable reporter gene used in molecular biology. The enzyme is very resistant to proteolytic degradation, then lysates could be assayed directly or store at -80 °C for at least 2 months. The presence of β-galactosidase can be easily detected. Its activity is commonly monitored using substrates such as X-GAL, ONPG or FDG.

REFERENCES	DESCRIPTION	FORMAT
TBK0543	ONPG β GALACTOSIDASE ASSAY KIT	500 assays
TBK0540	FDG β GALACTOSIDASE ASSAY KIT	500 assays

ONPG β-Galactosidase Assay Kit

Quantitative colorimetric assay based on the cleavage of the synthetic chromogenic lactose analogous substrate ortho-nitrophenyl-β-galactopyranoside (ONPG), releasing a bright yellow product called ortho-nitrophenol (ONP). The ONP production per unit time is directly proportional to the activity of β-galactosidase in the sample.

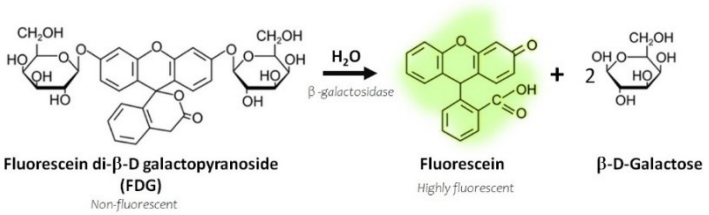


Features

- **Accurate and reproducible assay**, around 3,5-6% inter- and 3.3-5.5% intra- assay coefficient of variation.
- **Narrow dynamic range**, linearity from 0.2 to 2 nmol/min/mg protein.
- **Colorimetric readout** at 420 nm.
- **Highly Sensitive**, range detection of 0.1-10 nmol/min/mg protein.

FDG β-Galactosidase Assay Kit

Fluorimetric assay based on the hydrolysis of fluorescein di-β-D-galactopyranoside (FDG) into a highly fluorescent fluorescein. Fluorescein can be detected at 490 nm excitation/ 525 nm emission. The concentration of β-galactosidase is proportional to fluorescence produced.



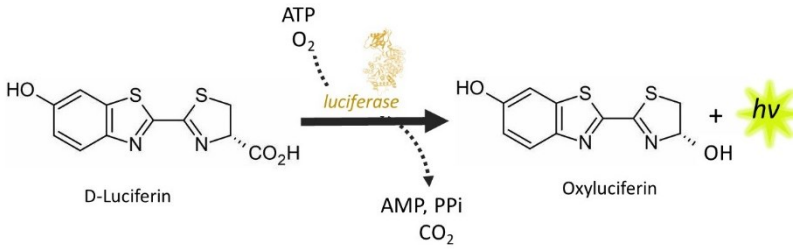
Features

- **Highly sensitive assay**, in femtogram range.

Luciferase Firefly Detection

Firefly Luciferase Assay Kit is an efficient, reproducible and superior dynamic range assay to quantify firefly luciferase activity. Luciferase from *Photinus pyralis* catalyzes a reaction between luciferin and molecular oxygen, producing oxyluciferin, carbon dioxide, and a flash of visible light. The kit improve this signal generating a sustained bioluminescent reaction.

The enzyme is used in reporter gene assays, where the luciferase gene is inserted into a DNA sequence of interest. When the sequence is expressed in a cell, the luciferase enzyme is produced, and its activity can be measured by adding luciferin to the sample. The resulting bioluminescence is directly proportional to the gene expression level, providing a highly sensitive and quantitative signal.



Features

- Intracellular enzyme.
- **Non-radioactive**, quick and highly specific assay.
- **Sustained light reaction** (*half life > 5 min*), without requirement of luminometer injection.
- **Highly sensitive assay**.
- **Broad dynamic range**, linearity in the range of 10^{-13} - 10^{-20} moles of luciferase.

Applications

- Luciferase reporter assay in cultured cells, bacteria or plants based in luciferase gene from the firefly *Photinus pyralis*.
- High-throughput screening for drug discovery.
- Gene expression and promoter studies.
- Cellular signaling analysis.

REFERENCES	DESCRIPTION	FORMAT
TBK0546	FIREFLY LUCIFERASE DETECTION KIT	100 assays
TBK0547	FIREFLY LUCIFERASE DETECTION KIT	1000 assays

SEAP Detection

Secreted alkaline phosphatase (SEAP) is widely used as a reporter for gene expression studies. Unlike conventional intracellular reporters, SEAP offers the unique advantage of being secreted into the culture medium by transfected cells. This allows SEAP activity in the medium to directly reflect intracellular SEAP mRNA and protein levels.

SEAP Assay Kit is a powerful tool for measuring gene expression with high sensitivity and precision. By leveraging chemiluminescent substrates such as the 1,2-dioxetane CSPD, this assay enables the detection of SEAP activity with remarkable sensitivity.

Features

- **Homogenous assay**, SEAP is secreted from transfected cells into the culture medium.
- **Highly sensitive assay**, in femtomolar range.
- **Accurate quantification** across varying levels of gene expression, from low-abundance transcripts to highly expressed genes.
- **Broad dynamic range**, typically spanning several orders of magnitude.

Applications

- Measurement of SEAP levels in transfected cells.
- Gene expression and promoter studies.
- Cellular signaling analysis.

REFERENCES	DESCRIPTION	FORMAT
TBK0537	SEAP ASSAY KIT	288 assays

OTHER ASSAYS

Q-PLUS™ *Mycoplasma* Detection Kit

Contamination with mycoplasma is among the most frequently occurring problems associated with cell cultures. With Q-PLUS™ *Mycoplasma* Detection Kit, the highly conserved 16S rDNA of more than 130 mollicute species is targeted, covering *Mycoplasma*, *Acholeplasma* and even *Ureaplasma*, whereas genomic eukaryotic DNA is not amplified.

REFERENCES	DESCRIPTION	FORMAT
TBK1065	Q-PLUS™ MYCOPLASMA DETECTION KIT	100 rxn

Lysozyme Detection Assay

Lysozyme Detection Kit provides ready-to-use reagents for detecting the presence of lysozyme activity. It is a turbidimetric method based on the lysis of *Micrococcus luteus* cells as substrate. The reaction is followed by monitoring the decrease in absorbance at 450 nm.

Features

- **Accessible to most laboratories**, the assay requires basic laboratory equipment.
- **Cost-Effectiveness**.
- **Sensitivity**, turbidimetric assays are sensitive and can detect variations in lysozyme activity effectively.

REFERENCES	DESCRIPTION	FORMAT
TBK0528	LYSOZYME DETECTION KIT	100 rxn

"We are awake now, and the question is how do we stay awake to the living world? How do we make the act of asking nature´s advice a normal part of everyday inventing."

Janine Benyus

An outstanding example of sustainable and biomimetic design, combining advanced technology with inspiration from natural forms, is *The Gherkin*. This 180-meter-tall architectural icon of London was conceived by renowned British architect Norman Foster (*United Kingdom, 1935*).

Foster, deeply committed to sustainability, designed this building inspired by the marine sponge Venus' Flower Basket (*Euplectella aspergillum*). Known also as the "glass sponge" and first described in 1841 by Richard Owen, the inaugural director of London's Natural History Museum, this sponge utilizes an intricate network of silica spicules that provide exceptional structural strength.

The Gherkin's biomimetic façade replicates this grid-like structure, enhancing the building's stability while reducing the use of heavy materials. This framework incorporates over 35 kilometers of steel, and the outer layer consists of 7,429 flat glass panels precisely placed to maximize natural light—a surprising achievement for a curved building. Notably, the dome's single curved glass panel sits at its apex.

The cylindrical shape of the skyscraper ensures uniform wind force distribution, allowing air to flow more smoothly than around traditional rectangular buildings. Its passive ventilation system incorporates circular floors with six openings per level, offset in contiguous floors. This design creates a natural ventilation cycle, channeling hot air upward and significantly reducing energy use for air conditioning, boosting the building's energy efficiency.

Foster's legacy in The Gherkin transcends its striking aesthetic. This biomimetic skyscraper has influenced generations of architects, showcasing how nature-inspired solutions can enhance sustainability and urban functionality. Today, it remains a model for future architecture, blending beauty, efficiency, and environmental respect.

#FromDeepSeaToSkyline