

# Luminescent Cell-Based Assays



## Fast and Accurate Cell Proliferation or Cytotoxicity Analysis

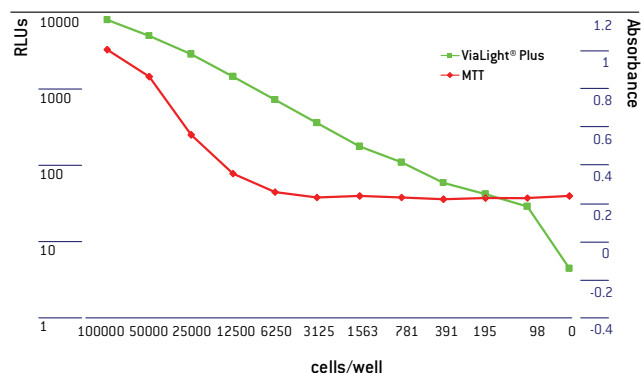
ViaLight® Cell Proliferation and Cytotoxicity BioAssay Kits are highly sensitive systems that provide quick and accurate analysis of cell proliferation and cytotoxicity in both adherent and non-adherent cell types. These kits take advantage of the power of bioluminescent detection of ATP. Measurement of ATP is the most accurate, effective, and direct way of determining the number of living cells in culture. This allows viable cells to be detected with the greatest sensitivity.

The kits employ a homogeneous reaction, which efficiently releases ATP from mammalian cells, inhibits endogenous enzymes, and allows measurement of ATP, providing unprecedented speed and convenience.

A number of ViaLight® BioAssay Kits have been developed to specifically address your research requirements.

- **ViaLight® Plus BioAssay Kit:** get unprecedented signal stability for convenient manual or robotic batch processing
- **ViaLight® HS BioAssay Kit:** the original and first bioluminescent cell proliferation assay
- **ViaLight® MDA Plus BioAssay Kit:** specifically designed for bacteria and yeast cells

### ViaLight® Kit is more sensitive



U937 cells were serially diluted in complete RPMI Medium to produce the cell numbers shown. The cells were assayed using CellTiter 96® (Promega; MTS assay) and ViaLight® Plus Kit (n=4). As the cell number decreases, the MTS Assay loses sensitivity and only detects >5,000 cells/well. The linearity of this MTS Assay seems to be between 5000-50,000 cells/well in this model. **ViaLight® Plus shows linear detection up to 100,000 cells/well and a sensitivity <100 cells/well.**

**ViaLight® Plus Cell Proliferation and Cytotoxicity BioAssay Kits are faster, more sensitive, and exhibit minimal interference from background or compounds compared to MTT**

	ViaLight® BioAssay Kit	Formazan dyes (MTT, MTS, XTT, WST-1, CellTiter96®)
Assay time:	<20 minutes	>1.5 hours to 24 hours
Sensitivity:	10 cells/well	1000 cells/well (2 hour minimum incubation)
Background:	Negligible	High
Sensitivity affected by cells metabolic rate:	No	Yes
Compound interference:	Minimal	Extensive, including cell culture media, DTT, reducing compounds, light, epirubicine, paclitaxel, doetaxel, cisplatin, dopamine, catecholamines, etc.

## Benefits of the ViaLight® BioAssay Kit

### Sensitive

- Detect as few as 10 eukaryotic cells, 100 yeast cells or 1,000 bacteria per well, allowing lower seeding densities and more assays
- Highly reproducible results; no separate mixing or centrifugation steps and low reagent viscosity facilitates ease of mixing even at low sample volumes with Z' values >0.7

### Fast

- All samples in a 96-well plate can be processed and analyzed in less than 10 minutes

### Convenient

- Dynamic range of five decades ensures consistent results and flexible experimental design
- Simply add two reagents to your well and read; no cell washing or medium removal required
- White walled tissue culture plates facilitate automation with absolutely no manipulations; simply transfer the plate directly from the incubator to the luminometer. Compatible with 384-well plates.
- Bioluminescence results in enhanced safety by eliminating scintillation cocktails and radioactive waste disposal

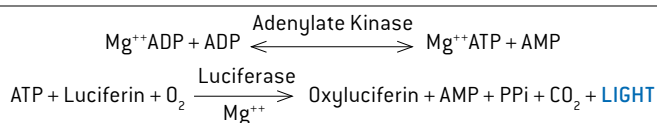
## Specifications

Number of tests per kit:	500 (5 96-well plates) 1,000 (10 96-well plates) 10,000 (100 96-well plates)
Detection limit:	10 mammalian cells per well – ViaLight® Plus and HS BioAssay Kits 1,000 bacterial cells per well, 100 yeast cells per well – ViaLight® MDA Plus BioAssay Kit
Assay time:	<15 minutes per plate – ViaLight® Plus and HS BioAssay Kits <15 minutes per plate – ViaLight® MDA Plus BioAssay Kit
Suitable cell types:	All mammalian cells, adherent and non-adherent – ViaLight® Plus and HS BioAssay Kits All bacterial (excluding spores) and yeast cells – ViaLight® MDA Plus BioAssay Kit
Operating temperature:	Ambient
Linear range:	Greater than 5 orders of magnitude
Reproducibility:	Typical Coefficient of Variation (CV) is ~6%
Correlation:	Shows excellent correlation with tritiated thymidine (typically, R <sup>2</sup> = 0.995, p<0.0001)
Recommended equipment:	Microplate luminometer with or without reagent injectors Microplate liquid scintillation counter with “luminescence” (i.e., out of coincidence) mode

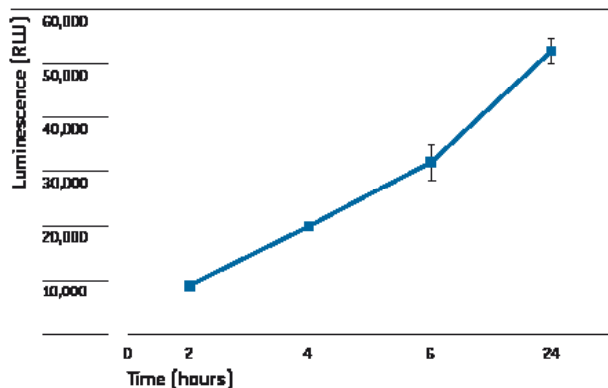
## Single Reagent High Content Cytotoxicity Assay

The ToxiLight® Non-Destructive Cytotoxicity BioAssay Kit provides a fast and easy way to determine cytotoxicity. It is non-destructive, which allows repeat samples to be taken over time or additional assays to be performed from the same sample. Now you can determine the kinetics of cell death from one sample, and still have cells for another experiment. The kit is very convenient to use because you only need to add one optimized reagent directly to the cell culture supernatant or well, eliminating tedious cell extraction steps.

The patented technology works by measuring the release of adenylylate kinase (AK) from damaged eukaryotic cells. AK is a robust protein that is released into cell culture media when cells die. AK actively phosphorylates ADP to form ATP, which is then measured on a luminometer using the bioluminescent firefly luciferase reaction. As the level of cytolysis increases, the amount of AK in the supernatant increases, resulting in the emission of a higher light intensity according to the following reactions:

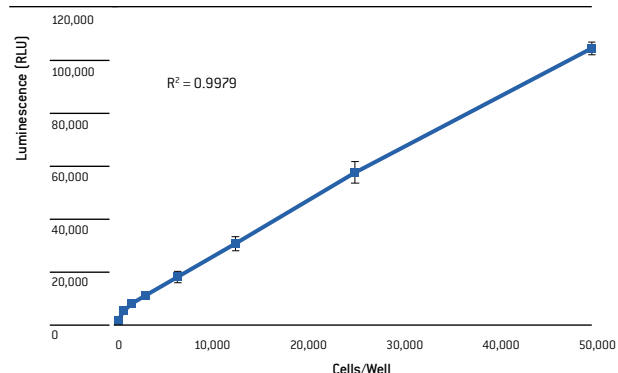


### Kinetics of Cytotoxicity



Samples (20 µl) of culture supernatant from cells treated with camptothecin were collected at various times and assayed for cytotoxicity.

### ToxiLight® BioAssay Kit is sensitive down to 10 cells



Exceptional sensitivity and wide dynamic range results in exceptional experimental flexibility.

## Benefits of the ToxiLight® BioAssay Kit

### Sensitive

- Detect as few as 10 dead eukaryotic cells per well allowing lower seeding densities and more assays
- Gives earlier indication of leaky membrane than LDH assays because AK is four times smaller than LDH

### Fast

- All samples in a 96-well plate can be processed and analyzed in less than 10 minutes

### Convenient

- Dynamic range of four decades ensures consistent results and flexible experimental design
- Highly reproducible results; no separate mixing or centrifugation steps and low reagent viscosity facilitates ease of mixing even at low sample volumes with typical Z' values of >0.7

### High Content Assay

- Non-destructive cytotoxicity assay permits use of cells for additional or subsequent analyses (e.g., reporter assays)
- Allows repeated sampling of culture supernatant for time course of cytotoxicity analysis
- Detects cell membrane damage, which provides a definitive assay of cytotoxicity

### Robust

- Unlike LDH, ToxiLight® BioAssays are not prone to problems with interpretation and errors due to changes in culture conditions
- Strong bioluminescent signal eliminates the need for radioactivity and is compatible with 96- or 384-well plates

### Specifications

Number of tests per kit:	500 (5 96-well plates) 1,000 (10 96-well plates) 10,000 (100 96-well plates)
Detection limit:	10 dead cells per well in homogeneous mode and 50 dead cells per well when the supernatant is sampled from the wells
Assay time:	1 second integrated reading per sample <15 minutes per 96-well plate
Suitable cell types:	All mammalian cells, adherent and non-adherent
Operating temperature:	Ambient
Linear range:	Greater than 3 orders of magnitude
Reproducibility:	Typical Coefficient of Variation (CV) ≈5%
Correlation:	Shows excellent correlation with other membrane permeability assays such as propidium iodide
Recommended equipment:	Microplate luminometer with or without reagent injectors Microplate liquid scintillation counter with "luminescence" (i.e. out of coincidence) mode

## Ordering Information

### ToxiLight® Non-Destructive Cytotoxicity BioAssay Kit

Lonza Cat. No.	Size
LT07-217	500 tests
LT07-117	1,000 tests
LT17-217	500 tests, 5 white TC plates

### ToxiLight® 100% Lysis Control Set (sold separately)

Lonza Cat. No.	Size
LT07-517	10 ml (200 tests)

### ViaLight® Plus Cell Proliferation and Cytotoxicity BioAssay Kit

Lonza Cat. No.	Size
LT07-221	500 tests
LT07-121	1,000 tests
LT07-321	10,000 tests
LT17-221	500 tests, 5 white TC plates

### ViaLight® HS Cell Proliferation and Cytotoxicity BioAssay Kit

Lonza Cat. No.	Size
LT07-211	500 tests
LT07-111	1,000 tests
LT07-311	10,000 tests

### ViaLight® MDA Plus Microbial Proliferation and Cytotoxicity Kit

Lonza Cat. No.	Size
LT07-122	1,000 tests
LT07-322	10,000 tests

## Contact Information

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