

# A Veritas™ Microplate Luminometer Method for Promega CellTiter-Glo™ Luminescent Cell Viability Assay



## 1. INTRODUCTION

The Turner BioSystems Veritas™ Microplate Luminometer in combination with Promega's CellTiter-Glo™ Luminescent Cell Viability Assay kit provides a convenient, rapid, and sensitive procedure for determining the number of viable cells in a culture based on quantitation of ATP, which signals the presence of metabolically active cells<sup>1</sup>.

The CellTiter-Glo™ Luminescent Cell Viability Assay kit uses luciferase as the detection enzyme because of the absence of endogenous luciferase activity in mammalian cells. The UltraGlow Luciferase used in the CellTiter-Glo™ Luminescent Cell Viability Assay kit generates a stable, glow-type signal that has a half-life of greater than four hours. This extended signal allows for batch-mode processing of multiple plates. Luciferase enzyme requires ATP in order to generate light. Metabolically active cells produce ATP as energy for respiration and other vital processes. After an equal volume of CellTiter-Glo™ Reagent is added to the cell culture, luminescence is measured. Light signal is proportional to the amount of ATP present which correlates with the number of viable cells present.

CellTiter-Glo™ Luminescent Cell Viability Assay System specifically maximizes the sensitivity of the assay reagent and provides a long-lasting luminescent signal. This system is widely used in life science research. The cell viability protocol is an efficient "add-mix-measure" system. CellTiter-Glo™ reagent is compatible with commonly used culture media for mammalian cells (RPMI 1640, MEM $\alpha$ , DMEM and Ham's F12) and tolerates phenol red and organic solvents.

The extended dynamic range of the Veritas™ Microplate Luminometer allows the user to easily measure very dim and very bright

samples on the same plate using the CellTiter-Glo™ Reagent. A pre-installed template on the Veritas™ facilitates quick set-up for the

CellTiter-Glo™ Luminescent Viability Assay. The Veritas™ Microplate Luminometer detects as little as  $1.5 \times 10^{-15}$  moles ATP using CellTiter-Glo™ Substrate. Measurements are linear from 760 fg to 5.1 ng ATP or more than 4 orders of magnitude (Figure 1).

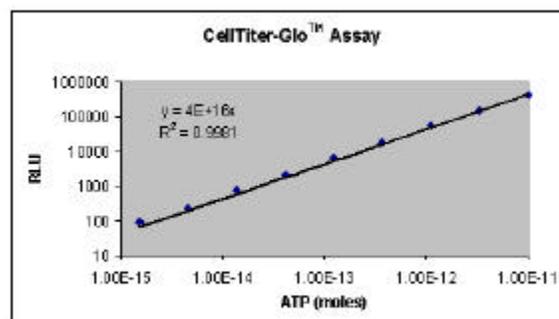


Figure 1. Promega's CellTiter-Glo™ Assay on the Veritas™ Microplate Luminometer using ATP standard diluted in HEPES buffer.

## 2. MATERIALS REQUIRED

- Veritas™ Microplate Luminometer (P/N 9100-000)
- 96-well plates, white (E&K Scientific EK-25075)
- CellTiter-Glo™ Luminescent Cell Viability Assay kit (Promega Catalog #'s G7570, G7571, G7572, G7573)
- p200 pipette and pipette tips

## 3. EXPERIMENT PROTOCOL

### 3.1 Reagent Preparation

**CellTiter-Glo™ Substrate:** Use as supplied. Store at -20°C.

**CellTiter-Glo™ Buffer:** Use as supplied. Store at -20°C. Buffer may be thawed

and stored at room temperature for 48 hours without loss of activity.

**CellTiter-Glo™ Reagent:** Transfer the contents of one bottle of CellTiter-Glo™ Buffer to one bottle of CellTiter-Glo™ Substrate. Mix by inversion until the substrate is thoroughly dissolved. Use reconstituted reagent on the same day it is prepared or store at 4°C for one to two days with 5—20% loss of activity.

**Note:** The temperature of the CellTiter-Glo™ Reagent should be held constant at room temperature while quantifying luminescence since luciferase activity is temperature dependent. Reagent stored frozen after reconstitution must be thawed below 25°C to ensure reagent performance. Mix well after thawing. The simplest method for thawing is placing the reagent in a water bath at room temperature.

### 3.2 Instrument Setup

3.2.1 Double click on the Veritas™ icon to start the software.

3.2.2 Click on "Run Promega Protocol" from the "Welcome to Veritas" dialog box.

3.2.3 Select "CellTiterGlo" from the list of Promega protocols.

3.2.4 Enter your information into the "Experiment", "Operator", "Plate No.", and "Notes" fields in the "Main Dialog Box".

3.2.5 Click on "Options" from the "Main Dialog Box" to select the wells to be read and modify the number of runs. Once modified, click the "Apply Changes" button to return to the "Main Dialog Box".

### 3.3 Sample Analysis

3.3.1 Add compound to be tested to the white 96-well plate containing 100 µL cell cultures. Wells without cells (culture media only) can be used as controls for background. Cultures without compounds should be used as experimental controls. Incubate according to culture protocols.

3.3.2 Equilibrate plate and contents to room temperature for approximately 30 minutes.

3.3.3 Add an equal volume (100 µL) of CellTiter-Glo™ Reagent. Mix gently for 2 minutes on an orbital shaker. Incubate at room temperature for 10 minutes to allow luminescent signal to stabilize.

3.3.4 Insert plate into the Veritas™ Microplate Luminometer and click on "Start" to begin assay. RLU values measured by the Veritas™ Microplate Luminometer will appear in the Excel spreadsheet after each row of the selected wells have been read. If you encounter an error message, refer to the troubleshooting guide for more information.

3.3.5 Once the measurements are complete, you can access Excel to analyze your data.

3.3.6 Remove your plate after measurement.

## 4. REFERENCES

1. Crouch, S.P.M. *et al.* (1993) The use of ATP bioluminescence as a measure of cell proliferation and cytotoxicity. *J. Immunol. Meth.* 160,81.

## 5. ABOUT PROMEGA CORPORATION

CellTiter-Glo is a trademark of Promega Corporation. Orders for Promega's products may be placed by:

Phone: (800) 356-9526  
Fax: (800) 356-1970  
E-mail: [custserv@promega.com](mailto:custserv@promega.com)

Mailing Address:

Promega Corporation  
2800 Woods Hollow Rd.  
Madison, WI 53711  
USA

## 6. ABOUT TURNER BIO SYSTEMS

Veritas is a trademark of Turner BioSystems

Orders for Turner BioSystems' products may be placed by:

Phone: (408) 636-2400 or  
Toll Free: (888) 636-2401 (US and Canada)  
Fax: (408) 737-7919

Web Site: [www.turnerbiosystems.com](http://www.turnerbiosystems.com)

E-Mail: [sales@turnerbiosystems.com](mailto:sales@turnerbiosystems.com)

Mailing Address:

Turner BioSystems, Inc.  
645 N. Mary Avenue  
Sunnyvale, CA 94085 USA

**CAUTION:** The lyophilized CellTiter-Glo™ Substrate contains dithiothreitol (DTT) and is therefore classified as hazardous. The reconstituted reagent is not known to present any hazards as the concentration of DTT is less than 1%. However, we recommend the use of gloves, lab coats and eye protection when working with these or any chemical reagents. Promega and Turner BioSystems assume no liability for damage resulting from handling or contact with these products.