

## Cell Meter™ TUNEL Apoptosis Assay Kit

### \*Green Fluorescence\*

Catalog number: 22849

Unit size: 50 Tests

| Component                          | Storage                                       | Amount         |
|------------------------------------|---|----------------|
| Component A: 100X Tunnelyte™ Green | Freeze (<-15 °C), Minimize light exposure     | Vial (25 µL)   |
| Component B: Reaction Buffer       | Refrigerate (2-8 °C), Minimize light exposure | Bottle (10 mL) |
| Component C: 1000X Hoechst         | Freeze (<-15 °C), Minimize light exposure     | Vial (50 µL)   |

#### OVERVIEW

DNA fragmentation represents a characteristic of late stage apoptosis. DNA fragmentation in apoptotic cells can be detected by terminal deoxynucleotidyl transferase (TdT)-mediated dUTP nick end labeling (TUNEL). The TUNEL assay relies on the presence of nicks in the DNA which can be identified by TdT, an enzyme that catalyzes the addition of dUTPs that are secondarily labeled with a marker. All the existing TUNEL assays contain the highly toxic sodium cacodylate which might induce apoptosis and also decrease DNA production and DNA strands. Our Cell Meter™ TUNEL Apoptosis Assay Kit uses a proprietary buffer system free of sodium cacodylate. The kit is based on the incorporation of our proprietary fluorescent dye into the DNA fragments that form during apoptosis. The assay is optimized for the direct detection of apoptosis in either detached or attached cells without using any antibodies. The kit provides all the essential components with an optimized assay protocol. It is suitable for fluorescence microplate reader, fluorescence microscope, or flow cytometer. Its signal can be easily detected at the popular FITC channel.

#### AT A GLANCE

##### Protocol summary

1. Prepare cells with test compounds.
2. Incubate with TUNEL working solution for 30 min to 1 hour at 37°C.
3. Wash the cells.
4. Fix cells with 4% formaldehyde (optional).
5. Read fluorescence intensity at Ex/Em = 490/525 nm (Cutoff = 515 nm), fluorescence microscope with FITC filter or flow cytometer with FITC channel.

**Important** Thaw all the components at room temperature before starting the experiment.

#### KEY PARAMETERS

|                              |                                |
|------------------------------|--------------------------------|
| Instrument:                  | Fluorescence microscope        |
| Excitation:                  | FITC filter                    |
| Emission:                    | FITC filter                    |
| Recommended plate:           | Black wall/clear bottom        |
| Instrument:                  | Flow cytometer                 |
| Excitation:                  | 488 nm laser                   |
| Emission:                    | 530/30 nm filter               |
| Instrument specification(s): | FITC channel                   |
| Instrument:                  | Fluorescence microplate reader |
| Excitation:                  | 490 nm                         |
| Emission:                    | 525 nm                         |
| Cutoff:                      | 515 nm                         |
| Recommended plate:           | Solid black                    |

#### PREPARATION OF WORKING SOLUTION

Add 0.5 µL of 100X Tunnelyte™ Green (Component A) into 50 µL of Reaction Buffer (Component B) to make a total volume of 50.5 µL of TUNEL working solution. Protect from light.

**Note** Each cell line should be evaluated on an individual basis to determine the optimal cell density.

#### PREPARATION OF CELL SAMPLES

For guidelines on cell sample preparation, please visit <https://www.aatbio.com/resources/guides/cell-sample-preparation.html>

#### SAMPLE EXPERIMENTAL PROTOCOL

1. Culture cells to an optimal density for apoptosis induction according to your specific protocol. We recommend about 30,000 to 50,000 cells/well for adherent cells grown in a 96-well microplate culture, or about 1 to 2 x 10<sup>6</sup> cells/mL for non-adherent cells. At the same time, culture a non-induced negative control cell population at the same density as the induced population for every labeling condition.

**Note** We treated HeLa cells with 100 nM - 1 µM staurosporine for 4 hours to induce cell apoptosis. See Figure 1 for details.

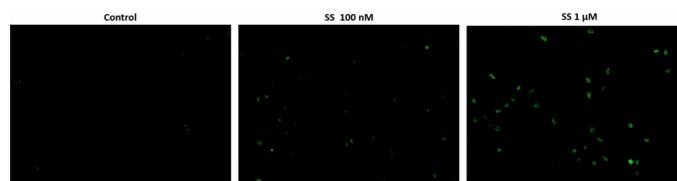
#### Stain and Fixation:

1. Remove cell media.
2. Add 50 µL of TUNEL working solution to each sample.
3. Incubate at 37°C for 30-60 minutes.
4. Remove TUNEL working solution, and wash the cells 1 - 2 times with 200 µL/well of PBS.
5. Add 100 µL Reaction buffer (Component B) to each sample.
6. Monitor the fluorescence intensity with a fluorescence microplate reader at Ex/Em = 490/525 nm (Cutoff = 515 nm), a fluorescence microscope with FITC filter set or a flow cytometer with FITC channel.
7. **Optional:** Remove the reaction buffer from Step 5, and add 100 µL/well/96-well plate of 4% formaldehyde fixative buffer (not supplied) to each well.

**Note** For non-adherent cells, add desired amount (such as 2X10<sup>6</sup> cells/mL) of 4% formaldehyde fixative buffer.

8. Incubate plates for 20 to 30 minutes at room temperature.
9. Remove fixative.
10. Wash the cells with PBS 2-3 times, and replace with 100 µL PBS/well/96-well plate.
11. Monitor the fluorescence intensity with a fluorescence microplate reader at Ex/Em = 490/525 nm (Cutoff = 515 nm), a fluorescence microscope with FITC filter set or a flow cytometer with FITC channel.
12. **Optional:** Stain the nucleus with 1X Hoechst (Component C) at Ex/Em = 350/460 nm for image analysis

#### EXAMPLE DATA ANALYSIS AND FIGURES



**Figure 1.** Fluorescence images of TUNEL reaction in HeLa cells with the treatment of 100 nM or 1  $\mu$ M staurosporine (SS) for 4 hours as compare to untreated control. Cells were incubated with TUNEL working solution for 1 hour at 37°C. The green fluorescence signal was analyzed using fluorescence microscope with a FITC filter set. Fluorescently labeled DNA strand breaks shows intense fluorescent staining in SS treated cells.

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