

Trypan Blue Solution, 0.4%

Cat. No.: T1523203 | Pack size: 20 mL; 100 mL | Storage: Room temperature

Overview

Trypan blue, also known as Trypan blue stain, has the molecular formula $C_{34}H_{24}N_6Na_4O_{14}S_4$, a molecular weight of 960.81 and CAS No. 72-57-1. It is an anionic dye. Trypan blue cannot penetrate the intact cell membrane of viable cells, so living cells remain unstained, which is known as the dye exclusion effect. In contrast, the cell membrane permeability of dead cells increases, allowing the dye to enter the cells and stain dead cells blue. It is the most commonly used method for cell viability detection. Generally speaking, the loss of cell membrane integrity indicates cell death, which is opposite to the staining principle of neutral red. Therefore, trypan blue staining enables simple and rapid differentiation between live and dead cells, and it is one of the most widely used staining methods for dead cell identification in tissue and cell culture.

Trypan Blue Solution (0.4%) is commonly used to detect cell membrane integrity and cell viability. Live cells are not stained blue, while dead cells turn pale blue. Since trypan blue can be phagocytosed by macrophages, it can serve as a vital stain for macrophages. After trypan blue staining, cell viability can be accurately quantified via direct microscopic counting or counting based on microscopic images, with 0.4% being the most frequently used working concentration. This reagent is only for scientific research purposes and is not applicable to clinical diagnosis or other uses.

Protocol

1. Cell Collection

For adherent cells, digest cells with trypsin-EDTA solution before collection; for suspension cells, collect directly. Centrifuge the harvested cells at 1000~2000 g for 1 minute, discard the supernatant, and resuspend the cell pellet in 1 mL PBS.

2. Trypan Blue Staining

Transfer 100 μ L cell suspension into a 1.5 mL or 0.5 mL centrifuge tube, add 100 μ L Trypan Blue Solution (0.4%) and mix gently. Let stand for 3 minutes for staining. The staining time can be properly extended, but shall not exceed 10 minutes.

3. Cell Counting

Take the stained cell mixture and count cells with a hemocytometer. For accurate quantification, count no less than 500 cells per sample, and record the number of blue-stained cells and total cells.

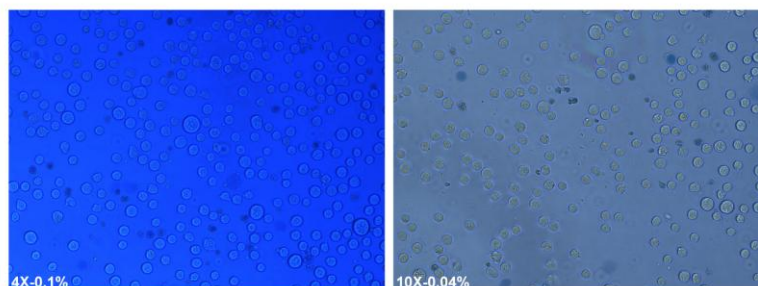
4. Cell viability is calculated using the following formula:

$$\text{Cell Viability} = (\text{Total Cell Number} - \text{Blue Cell Number}) / \text{Total Cell Number} \times 100\%$$

Notes

1. Trypan Blue Solution (0.4%) is slightly irritating to the human body. Please take proper protective measures during operation.
2. Note that apoptotic bodies may occasionally show trypan blue dye exclusion.
3. For your personal safety and health, please wear lab coats and disposable gloves when handling.

Results Presentation



Trypan Blue staining of K562 cells

Figure 1. Viability test of K562 cells using Trypan Blue staining.

Cells were collected by centrifugation (1000 rpm, 5 min), resuspended in PBS. Stain for 3 minutes using either 750 μL cell suspension + 250 μL Trypan Blue (4 $\times$) or 900 μL cell suspension + 100 μL Trypan Blue (10 $\times$). Blue-stained cells were counted as dead cells.

Specifications

Item	Information
Synonyms	Trypan Blue Solution Blue cell viability dye
Specifications & Purity	BioReagent, Biological Stain, Suitable for Analysis, 0.4%
Stability And Storage	Store at room temperature long term (12 months).
Storage	Room temperature
Shipped In	Normal
Note	This product can replace T1523203

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- ☐ This product is not a CE-marked in vitro diagnostic device under IVDR (EU) 2017/746 and is not an FDA-cleared device under 21 CFR. Use is restricted to verified businesses, institutions, and qualified professionals for research and development purposes.

- ☐ Where any kit component is classified as hazardous under CLP (EC) 1272/2008 or OSHA HCS (29 CFR 1910.1200), the product Safety Data Sheet (SDS) takes precedence over this document for handling, storage, and disposal information.
- ☐ Performance depends on sample type, sample condition, handling, and operator technique. Users are responsible for validating the kit for their specific application.
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