

Evans Blue Staining Solution (0.5%)

Cat. No.: M1507837 | Pack size: 100ml | Storage: Store at 2-8°C, Protected from light

Product Information

Item	Description
Product name	Evans Blue Staining Solution (0.5%)
Catalog No.	M1507837
Pack size	100ml
Specifications & Purity	BioReagent, Biological Stain, for microscopy, 0.5%
Synonyms	Evans Blue Staining Solution
Storage	Store at 2-8°C, Protected from light
Shipped in	Wet ice
Application	Cell analysis, Cell Staining, Live/Dead Cell Assay
Stability and storage	Store at 2-8°C long term (12 months). Store in the dark.
CAS	314-13-6
Molecular Weight	960.81
EC Number	206-242-5
Beilstein Registry Number	16(2)259

Overview

Evans Blue, also known as azo blue, has a molecular formula of $C_{34}H_{24}N_6Na_4O_{14}S_4$, a molecular weight of 960.81, and a CAS number of 314-13-6. As a commonly used azo dye preparation, Evans Blue has a molecular weight similar to that of plasma albumin and high affinity with plasma albumin in the blood. Therefore, it is often used in neuroscience research to trace and observe the integrity of the blood-brain barrier (BBB). It is also used for cell staining to distinguish between live and dead cells, and for blood volume determination. Clinically, Evans Blue is used as a drug to measure plasma and blood volume, and also for the positioning of arterial cannulation. Under normal circumstances,

plasma albumin cannot penetrate the blood-brain barrier. Thus, if the BBB in the nervous system remains intact after staining, Evans Blue bound to plasma albumin will not stain the nervous system. On the contrary, if the BBB is damaged, Evans Blue can enter the nervous system and stain it. Evans Blue shows strong absorption peaks at fluorescence wavelengths of 470 nm and 540 nm, and a weak peak at 680 nm, and can be detected by chemical dialysis and colorimetry.

Both Evans Blue and trypan blue are cell viability dyes, commonly used to detect the integrity of cell membranes and cell viability. Live cells will not be stained blue, while dead cells will be stained light blue. After Evans Blue staining, the cell survival rate can be quantified relatively accurately by direct counting under a microscope or counting after microscopic photography. The most commonly used concentration is 0.5%. Live cells cannot be stained by Evans Blue due to their efflux function, so this method can be used to distinguish dead cells from live cells under a microscope, but cannot distinguish between apoptosis and necrosis. Evans Blue Staining Solution (0.5%) is mainly composed of Evans Blue and phosphate solution. This reagent is for research use only and not for clinical diagnosis or other purposes.

Materials to Be Prepared by Users

1. Syringes, tissue homogenizers.
2. PBS (Phosphate-Buffered Saline), trichloroacetic acid, or acetone.

Operating Procedures (for Reference Only)

(1) Blood-Brain Barrier Permeability Test

1. Take the treated experimental animals (mice as an example), and inject 0.5% Evans Blue Stain via the tail vein or femoral vein at a dose of 2-3 ml/kg. Within a few seconds to 1 minute, the mice's eyes and skin will turn blue. Sacrifice the mice 0.5-1 hour later and collect the target brain tissue.
2. Place the brain tissue in a 1.5 ml centrifuge tube, add 1 ml of PBS, and quickly homogenize the brain tissue using a tissue homogenizer. Centrifuge at 1000×g for 15 minutes.
3. Collect the supernatant, add an equal volume of trichloroacetic acid, and incubate at 4°C for 18-24 hours. Alternatively, the following operation can be adopted: collect the supernatant, add acetone at a ratio of supernatant:acetone = 3:7, and incubate at room temperature for 24 hours.
4. Centrifuge at 1000×g for 20-30 minutes or at 2000×g for 15 minutes.
5. Take 1-2 ml of the above solution, measure the absorbance (OD value) at 620 nm using a spectrophotometer. Meanwhile, determine the OD values of standard Evans Blue solutions with different gradients, draw a standard curve, and calculate the Evans Blue content in the sample to be tested based on the standard curve.

(2) Live Cell Staining

1. Take 100 μ l of resuspended cells into a conventional 1.5 ml or 0.5 ml centrifuge tube, add 100 μ l of 0.5% Evans Blue Stain, mix gently, and stain for 3 minutes (the staining time can be appropriately extended but should not exceed 10 minutes).
2. Aspirate a small amount of stained cells and count them using a hemocytometer. For relatively accurate quantification, at least 500 cells should be counted for each cell sample, and the number of blue cells and the total number of cells should be recorded. The calculation formula is as follows:
3. Cell Survival Rate = $[(\text{Total Number of Cells} - \text{Number of Blue Cells}) / \text{Total Number of Cells}] \times 100\%$

(3) Seed Staining

1. Make cross-sections and accurate longitudinal sections along the center of the seed embryo using a blade, then immerse the sections in the staining solution for 3-5 minutes.
2. Soak the stained sections in distilled water for 20-60 minutes, depending on the degree of decolorization.

Precautions

1. 0.5% Evans Blue Stain has slight toxicity to the human body; please take careful protective measures.
2. During cell staining, note that apoptotic bodies may occasionally exhibit dye exclusion (i.e., not be stained).
3. In the blood-brain barrier permeability test, the injection volume of 0.5% Evans Blue Stain should be adjusted according to the type and weight of the experimental animals.
4. It is recommended to use a low-temperature refrigerated centrifuge for centrifugation.
5. After opening the reagent, use it as soon as possible to avoid affecting the results of subsequent experiments.
6. For your safety and health, please wear a lab coat and disposable gloves during operation.

Safety & Precautions

1. Read the current SDS before use and handle the product according to local laboratory safety and EHS procedures.
2. Avoid direct contact with staining solutions. Protect light-sensitive products from light as indicated on the label.
3. Wear a lab coat, disposable gloves, and appropriate eye protection during operation.

4. For research use only. Do not use for clinical diagnosis, treatment, food, cosmetic, or household applications.

Quality Control

QC Item	Method	Acceptable Range
Appearance and color	Visual inspection	Product-consistent color with no visible microbial contamination or abnormal precipitation
Staining performance	Use on representative samples according to the procedure	Expected staining intensity and contrast are obtained
Storage condition	Review label and COA before use	Stored under recommended conditions, protected from light when indicated

Troubleshooting

Issue	Possible Causes	Corrective Action
Weak staining	• Insufficient staining time • Reagent deterioration or improper storage • Sample preparation not optimized	• Extend staining time within the recommended range • Confirm storage condition and protect from light where required • Optimize sample preparation and washing steps
High background or overstaining	• Excessive staining time • Inadequate washing or decolorization • Excess reagent carried over	• Shorten staining time • Increase washing/decolorization as appropriate • Use clean tools and recommended volumes
Precipitate or uneven staining	• Reagent not mixed well • Contaminated sample or container	• Mix gently before use • Use clean containers and filter only if validated for the assay

Recommended Applications

Cell analysis · Cell Staining · Live/Dead Cell Assay.

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Limitations & Disclaimer

- For Research Use Only (RUO). Not for use in human or animal diagnostics, therapeutics, or in vivo applications. Not for food, cosmetic, or household use.
- 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.
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