TTC Staining Solution (1%)

Cat #: A-CSH376

Size: 100mL

Storage: 2~8°C, avoid light (6 months)

Product Composition

Component	Size		Store at
TTC staining solution (1%)	50ml	100ml	2~8°C, and were protected from light

Product Description

2,3,5-Triphenyltetrazolium chloride (TTC) is a lipophilic photosensitive compound with a molecular weight of 334.80 and a molecular formula of C19H15ClN4. Its CAS number is 298-96-4. TTC was initially used to assess seed viability and later applied in staining to detect ischemic infarction in mammalian tissues. In the respiratory chain, TTC acts as a proton acceptor for the pyridine nucleotide-linked enzyme system. When TTC reacts with respiratory enzymes in normal tissue, it turns red. However, in ischemic tissue with reduced respiratory enzyme activity, no reaction occurs, resulting in a pale appearance. This staining method is a macroscopic staining technique used to evaluate dehydrogenase activity in tissues.

TTC staining solution (1%) allows for earlier observation of myocardial infarction and necrotic areas in brain tissue compared to electron microscopy by 3-6 hours and compared to light microscopy by 24 hours. It is commonly used for staining fresh heart and brain tissue in autopsy samples, as well as early-stage infarcted tissue in experimental animal models. It can also be used to assess seed and pollen viability. The characteristics of this product include: 1) TTC staining can be performed directly on fresh tissue without the need for fixation or embedding; 2) The staining time is short, typically 20-30 minutes; 3) The TTC staining solution can be reused, with 10 ml being sufficient for staining 20 slides.

Usage

(I) Brain tissue staining

1. Take the fresh brain tissue sample to be tested (usually directly from the brain after anesthesia or after perfusion with physiological saline). After removal, freeze the sample at -20°C for 20-30 minutes for easier sectioning.

2. Slice the brain tissue sample. For animal samples, the thickness is generally 2-3 mm, while for human samples, it is 3-5 mm. Cut 4-5 consecutive slices. The first cut should be made at the midpoint between the frontal pole and the optic chiasm; the second cut at the optic chiasm; the third cut at the infundibular stalk; and the fourth cut between the infundibular stalk and the posterior lobe (reference: Zhang Juntian, editor, Modern Pharmacological Experimental Methods).

3. Immerse the sections in TTC staining solution (1%) and incubate in the dark for 30-35 minutes.

4. Fix the sections in 4% paraformaldehyde or 10% neutral formalin for 4-24 hours.

5. Rinse the tissue surface with distilled water and use an image analysis system such as IPP to measure the area of brain infarction and calculate the volume of cerebral infarction.

(II) Seed staining

1. Take seeds with different viabilities and make transverse and accurate longitudinal sections along the central axis of the embryo using a blade. Keep one half of each seed for later use.

2. Place the aforementioned seeds in TTC staining solution (1%) and incubate in the dark at 37°C for 20 minutes.

3. Pour out the staining solution and rinse with tap water 2-3 times. Immediately observe the staining of the embryos.

Staining Results

Normal cardiac muscle or brain tissue	red
Areas of necrotic myocardial or cerebral infarction	pale asphyxia
Ischemic brain tissue	In-between the red and the pale white

Notes

1. TTC staining solution (1%) has slight irritant properties to the human body, so please handle with care and take appropriate protective measures.

2. When obtaining brain samples, ensure the integrity of the brain tissue by handling it carefully.

3. If the staining results are unsatisfactory, consider extending the staining time appropriately.

4. Fresh samples yield better results. To prevent a decrease or loss of enzyme activity in normal myocardium and brain tissue, it is recommended to perform the staining as soon as possible.

5. For your safety and health, please wear laboratory attire and disposable gloves while performing the procedure.

Disclaimer

The reagent is only used in the field of scientific research, not suitable for clinical diagnosis or other purposes.