TTC Staining Solution (2%)

Cat #: A-CSH377

Size: 100mL, 500mL

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

Product Composition

Component	Size		Store at
TTC staining solution (2%)	100ml	500ml	2~8°C, and were protected from light

Product Description

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

TTC staining solution (2%) allows for observation of myocardial infarction and necrotic areas in brain tissue earlier than electron microscopy by 3-6 hours and earlier than 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. Its characteristics 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

1. Take the 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 (2%) and incubate in the dark for 25-35 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.

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 (2%) 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.