Giemsa Staining Solution (Giemsa Stain, 1:9)

Cat #: A-CSH292

Size: 100mL, 500mL

Storage: 10-30 °C, Avoid exposure to light (2 years)

Product Description

Component	Size		Store at
Reagent (A): Giemsa Stain (10×)	10ml	50ml	10-30°C, Avoid exposure to light
Reagent (B): Phosphate Buffer Solution	100ml	500ml	10-30°C

Giemsa stain, also known as Jimsa stain, is a mixture of Azure II and Eosin. Its staining principle and results are similar to Wright's stain. Giemsa stain has a strong affinity for the cytoplasm and can effectively demonstrate the degree of basophilia in the cytoplasm, especially for basophilic, acidophilic, and basophilic granules in blood and bone marrow cells, resulting in clear staining. However, it tends to produce excessive staining of the cell nuclei and poor visualization of nuclear structures. Therefore, Giemsa stain is often used in combination with Wright's stain. Giemsa stain is composed of imported Giemsa dye and methanol as the main ingredients, and it can provide clear cellular staining effects. It is commonly used for tissue sections, blood and cell smears, bacterial staining, chromosome banding, and staining of protozoan parasites. Acidophilic granules are acidic proteins that bind with the acidic dye Eosin, resulting in pink staining, referred to as acidophilic substances. Nuclear proteins and lymphocyte cytoplasm are acidic and bind with basic dyes such as Methylene Blue or Azure II, resulting in purple-blue staining, referred to as basophilic substances. Neutral granules remain in an isoelectric state and can bind with both Eosin and Methylene Blue, resulting in pale purple staining, referred to as neutral substances.

This product consists of Giemsa Stain (10×) and phosphate buffer solution, mixed at a ratio of 1:9 to prepare the working solution. It can also be used separately by first staining with Giemsa stain and then treating with phosphate buffer solution to achieve satisfactory staining results.

Usage

(1) Single-step smear staining:

1. Preparation of Giemsa working solution:

2. Mix reagent (A) and reagent (B) at a ratio of 1:9. Take 1 part of Giemsa stain (10×) and add it to 9 parts of phosphate buffer solution, mix thoroughly to obtain the Giemsa working solution. The Giemsa working solution is a ready-to-use reagent and should be prepared immediately before use as it is not suitable for long-term storage.

3. Prepare blood smears or bone marrow smears using standard methods and allow them to air dry. Fix the smears with methanol for 1-3 minutes.

4. Place the blood smears or bone marrow smears on a staining rack and add the Giemsa working solution to cover the smears. Incubate at room temperature for 15-30 minutes.

5. Slowly rinse the slide with tap water or distilled water from one end.

6. Allow the slide to dry and examine under a microscope.

(2) Two-step smear staining:

1. Preparation of Giemsa working solution:

2. Mix reagent (A) and distilled water at a ratio of 1:4. Take 1 part of Giemsa stain (10×) and add it to 4 parts of distilled water, mix thoroughly to obtain the Giemsa working solution. The Giemsa working solution is a ready-to-use reagent and should be prepared immediately before use as it is not suitable for long-term storage.

3. Prepare blood smears or bone marrow smears using standard methods and allow them to air dry. Fix the smears with methanol for 1-3 minutes.

4. Place the blood smears or bone marrow smears on a staining rack and add an appropriate amount of Giemsa working solution to cover the smears. Incubate at room temperature for 10-15 minutes.

5. Add an equal amount of phosphate buffer solution and gently shake the slide. Allow it to sit at room temperature for 5-10 minutes.

6. Slowly rinse the slide with tap water or distilled water from one end.

7. Allow the slide to dry and examine under a microscope.

(3) Tissue section staining:

1. Preparation of Giemsa working solution:

2. Mix reagent (A) and reagent (B) at a ratio of 1:9. Take 1 part of Giemsa stain (10×) and add it to 9 parts of phosphate buffer solution, mix thoroughly to obtain the Giemsa working solution. The Giemsa working solution is a ready-to-use reagent and should be prepared immediately before use as it is not suitable for long-term storage.

3. Immediately place fresh tissue in Regaud fixative for 2 days, with a change of fixative once during this period.

4. Fix with 3% potassium dichromate for 1 day.

5. Rinse under running water for 16 hours or overnight.

6. Perform routine dehydration and embedding.

7. The section thickness should be approximately 5 μm, and perform routine deparaffinization to water.

8. Rinse with distilled water twice, each time for 1 minute.

9. Place the sections in a staining dish containing the Giemsa working solution and incubate for 18-24 hours.

10. Rinse briefly with distilled water.

11. Wash with 0.1-0.5% acetic acid for 1-2 minutes.

12. Rinse briefly with tap water.

13. Perform rapid dehydration with absolute ethanol three times, each time for 5-10 seconds.

14. Clear with xylene and mount with neutral resin.

Staining Results

Smear Staining:	Eosinophilic granules	Pink
	Basophilic granules	Purple-blue
	Neutrophilic granules	Pale purple
Tissue Section Staining:	Cell nuclei	Blue to purple
	Cytoplasm	Light blue
	Chromaffin cell cytoplasm	Yellow-green
	Connective tissue	Pale pink

Notes

1. Blood smears or bone marrow smears should be prepared with uniform thickness to avoid affecting the staining results.

2. After staining in smear staining, do not remove the staining solution or rinse the smears forcefully.

3. If the staining is too dark or too light, adjust the staining time or the concentration of the working solution.

4. In smear staining and tissue section staining, pH value has a certain impact on the staining. The slides should be clean and free from acid or alkaline contamination to avoid affecting the staining results.

5. After diluting the staining solution, the liquid surface should have a metallic luster, indicating that the solution has staining effect. Otherwise, the staining solution may be ineffective.

6. In tissue section staining, after staining, it is necessary to rinse the slides rapidly with abundant 0.1-0.5% acetic acid to avoid contamination of the sections by precipitates on the surface that are difficult to remove.

7. 0.5% acetic acid differentiation is commonly used in Giemsa tissue section staining and can also be used for cell smears if necessary, but the concentration should be adjusted appropriately. When performing 0.5% acetic acid differentiation on sections, the sections should turn pink, indicating the termination of the differentiation.

8. In Giemsa tissue section staining, dehydration with absolute ethanol should be done rapidly, otherwise the sections may fade.

9. In smear staining and tissue section staining, if rapid results are required, a rapid Giemsa staining working solution can be prepared by mixing Giemsa stain (10×) with phosphate buffer solution at a ratio of 1:1, thoroughly mixed. Apply the staining solution to the cell smears or tissue sections, heat the staining, and after 20-30 seconds, reapply the staining solution, repeating 5-10 times. Follow the remaining steps as described above.

10. The staining solution can be reused, but it should not be reused multiple times. If there are precipitates, filter the solution before using.

11. Regaud fixative: Prepare by mixing 3% potassium dichromate with formaldehyde at a ratio of 4:1. Mix well before use. It becomes ineffective after 1-2 days.

Disclaimer

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