

May-Grünwald solution

REF. 320070

Fixation and differential staining of cellular structures



IFU016A-RAL

For professional use only.

Please read all information carefully before using this device.

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Intended use

May-Grünwald solution is intended to be used in combination with Giemsa solution for the fixation and the differential staining of cellular structures prior microscopic examination.

If applicable, RAL Diagnostics recommends using the associated RAL Diagnostics products and cannot guarantee that the expected results will be achieved if used in combination with products of other brands.

Principle

Staining according to Pappenheim allows differential medullary and blood cells counting. It combines two stains: May-Grünwald and Giemsa stains. These are neutral mixtures with very distinct properties. They are not active in alcoholic medium and only act selectively when released in a buffered aqueous solution. This releasing induces the precipitation of neutral stains. May-Grünwald stains the acidophilic elements and the neutrophilic granulations of the leukocytes. Giemsa stains the cytoplasm of monocytes and lymphocytes as well as the chromatin of the nuclei.

Device description

May-Grünwald solution

Clear dark blue solution

REF. 320070-0500 1 x 500 mL

REF. 320070-1000 1 x 1.0 L

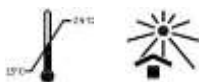
REF. 320070-2500 1 x 2.5 L

For a specific batch, refer to the analysis certificate of the batch available at my.ral-diagnostics.fr.

Storage

Storage temperature: 15-25°C away from light.

Bottle shelf life before and after opening: refer to the expiry date on the label.



Active components

May-Grünwald solution

May-Grünwald: ca 0.3 %

Hazard classification and safety information

May-Grünwald solution

Danger: H225 - Highly flammable liquid and vapour. H301 -

Toxic if swallowed. H311 - Toxic in contact with skin. H331

Toxic if inhaled. H370 - Causes damage to organs. P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P261 - Avoid breathing dust/fume/gas/mist/vapours/spray. P264 - Wash hands thoroughly after handling. P280 - Wear protective gloves, protective clothing, eye protection, face protection. P301+P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor. P308+P311 - IF exposed or concerned: Call a POISON CENTER or doctor.



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Personnel qualification

All samples and products must be handled by qualified and authorized personnel, using individual or collective protection, in accordance with the national directives in force in the laboratories. Personnel must also be aware of the classification of hazardous materials indicated on the label and the safety data sheet (available at my.ral-diagnostics.fr).

The specimen must be treated in accordance with procedures available in the laboratory and required by national authorities.

The diagnosis must be conducted by qualified and authorized personnel, in accordance with the procedures in force within the laboratory.

Specific equipment and reagents required but not provided

Sodium hyposulfite aqueous solution, ethanol, acetone, mounting media, microscope slides, and these following RAL Diagnostics devices:

Giemsa R solution REF. 320310

Giemsa L solution REF. 320300

pH=6.8 buffer solution for Haematology REF. 330368

pH=7.0 buffer solution for Haematology REF. 330370

pH=7.2 buffer solution for Haematology REF. 330372

Lugol, PVP-stabilized solution REF. 367400

This equipment may vary depending on the protocol. Please refer to the relevant protocol (see the section operating procedure) to ensure that you have the necessary equipment to carry out tests.

Operating procedure

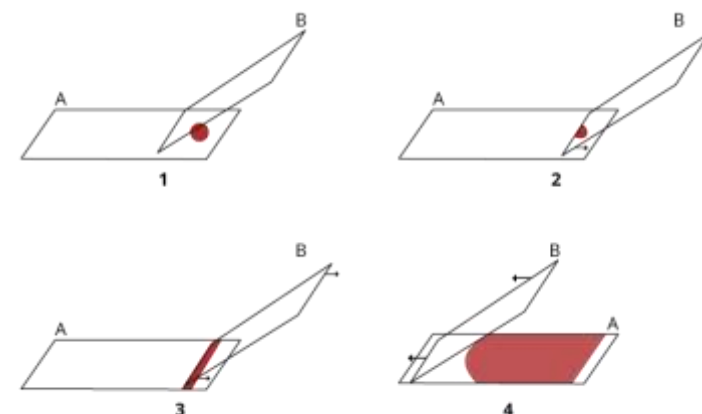
The equipment used for sample processing must comply with the supplier's instructions for use.

Sample preparation

The following examples are for hematological sample preparations, specimen must treat in accordance with procedures available in the laboratory and promulgated by national authorities.

Manual blood smear: Mix the tube by slow inversion and install a smearing droplet device. Invert the tube and lightly press the drop depositor onto a slide to deposit a small drop of blood (Fig. 1- slide A at step 1).

Using another slide tilted at 45° (Fig. 1- slide B at step 1), spread the blood by capillarity on the short edge (Fig. 1- steps 2 & 3) using a pushing motion (Fig. 1- step 4). A good quality smear does not reach the end of the slide and has a gradual decrease in thickness until the end is feathered. Allow the smear to air dry before fixing or staining.



NB: if you do not have a smearing droplet device, open the tube, and use a pipette to deposit a blood drop.

Figure 1. Schematic representation of performing a blood smear

A & B: slides, 1 – 4: steps 1 to 4

Manual bone marrow smear by crushing method: using a pipette deposit, a small amount of the sample on a microscope slide. Blot up blood excess to keep only shiny lumps. Cover the first slide with a slide. Squeeze and thin the sample by sliding and stretching to the end of the slide. A good quality smear does not reach the end of the slide. Discard the slide used for smearing. Allow the smear to air dry before fixing or staining.

Reagents and instruments preparation

If applicable dilute May-Grünwald solution and the Giemsa solution according to the indications in the protocol section. Transfer the solutions into staining baths as indicated in the protocols below.

Acetic water: 5 drops in 100 mL of distilled water

5 % sodium hyposulfite aqueous solution: 5g of sodium hyposulfite in 100 mL of distilled water

Protocols

The staining steps of the protocols indicated below consist of a successive dipping of the slides in the different staining baths.

Protocol hematological samples - Manual bath staining method - Manual microscopic analysis

Processing time: 14 min 10 s

Steps	Reagent	Time [mm:ss]	Indications
Fix and pre-stain	May-Grünwald solution	03:00	No
Rinse	Buffer Solution	01:00	
Stain	1/20 Giemsa R solution diluted in buffer solution	10:00	
Rinse	Buffer Solution	00:10	Agitate continuously in the bath during the countdown
Dry	No	≥03:00	No

Protocol for histological sections - Manual bath staining method- Manual microscopic analysis

Processing time: 65 min

Steps	Reagent	Time [mm:ss]	Indications
Stain	Lugol, PVP-stabilized solution	05:00	*
Stain	5 % sodium hyposulfite aqueous solution	05:00	No
Rinse	Distilled water	No	
Stain	1/5 May-Grünwald solution diluted in distilled water	15:00	In an autoclave at 37° C
Stain	Giemsa L solution (3 drops in 2 mL)	40:00	
Differentiate	Acetic water (5 drops for 100 mL)	No	Then drain onto filter paper
Rinse	Distilled water	No	
Dehydrate	Ethanol/ acetone mixture 50/50		2 baths
Dehydrate	Toluene or xylene		
Mount	Toluene or xylene based mounting media		No

*Dewax and et hydrate histological sections in appropriate reagents before staining.

Expected results

hematological samples

Nuclei / Chromatin: ± dense purple

Granulocytes cytoplasm without RNA: light purplish-pink

Granulocytes eosinophilic granules: orangey-pink

Granulocytes basophilic granules: dark blue

Granulocytes neutrophilic granules: ± deep purple-pink

Lymphocytes cytoplasm with RNA: pure blue

Lymphocytes cytoplasm without RNA: light blue

Lymphocytes azurophilic granules: red

Monocytes cytoplasm: purplish-blue

Erythrocytes: pinkish-beige to beige-grey

Platelets chromomere: purplish-red

Platelets hyalomere: bluish

Blood parasites nucleus: red

Blood parasites cytoplasm: blue

histological sections samples

Nuclei / Chromatin: purple to pink

Basophilic cytoplasm: Sky to dark blue

Acidophilic cytoplasm: Light red to pinky

Polychromatophilic cytoplasm: greyish or purplish

Acidophilic leukocyte granulations: orangey

Neutrophilic leukocyte granulations: dirty brown pink

Basophilic leukocyte granulations: dark violet

Azurophilic leukocyte granulations: purple or purplish

Basophilic erythrocyte granulations: cobalt blue

If observed results vary from those expected, please contact RAL Diagnostics technical service through your usual supplier for assistance.

Performance

This medical device is state of the art. Its analytical performance, scientific validity and medical relevance are assessed in the CE marking review.

To ensure product performance, use clean and dry laboratory equipment.

The laboratory is responsible for notifying the manufacturer and state competent authority of any serious incident relating to the medical device uses.

User quality control

Users are responsible for determining the appropriate quality control procedures for their laboratory and complying with applicable laboratory regulations.

Hematological sample: RAL Diagnostics recommends staining a freshly made blood smear with a normal WBC count and no known abnormal pathology at reagent renewal and for the first staining cycle each day. Slides stained for quality control purposes should be checked to ensure that they are satisfactory for intended test (properly stained and free of precipitate).

These quality control procedures should only be performed by qualified personnel.

Other products

For more information, please contact your usual supplier.

Recommendations, notes and troubleshooting

Products appearance

If the appearance of the products differs from the description above, do not use it and contact RAL Diagnostics technical service through your usual supplier for assistance.

Procedure notes

To prevent products degradation, please comply with the storage and handling recommendations specified in this manual.

Quality and reproducibility of staining are obtained by using buffer solution. Due to complex mode of action of stains, it is essential to set up standard staining conditions to assure a perfect staining quality and reproducibility. The use of tap water or water mixing is not recommended because unpredictable variations may occur and alter staining results.

Quality and reproducibility of staining are obtained using Buffer solution specially formulated for Hematology. Safe for users, Buffer solutions for Haematology are formulated with phosphates, are specially developed for hematology, and allow to guaranty a better products stability and rinsability.

Product stability

Every RAL Diagnostics product can be used until the expiry date indicated on, in its original packaging if it is still hermetically sealed.

Staining stability

Staining quality and reproducibility depend on the correct use of the products. Staining conducted according to these recommendations will remain stable for several days. If it is necessary to store the stained smears for several months or years, RAL Diagnostics recommended mounting them with a coverslip, using a suitable mounting liquid and storing them in a light and dustproof container.

Instructions for cleaning and waste disposal

All biological samples, effluents and used consumables should be considered potentially hazardous.



To avoid any risk, apply the following instructions: dispose of samples, effluents and consumables in accordance with laboratory standards and applicable national and local standards and regulations.

Chemical and biological waste must be collected and processed by specialized, registered companies.

Table of symbols and abbreviations

Depending on the product, you may find the following symbols on the device or the packaging material.

GHS PICTOGRAMS	INTERPRETATION	SYMBOL	INTERPRETATION
	Explosive		Batch code
	Flammable		Serial number
	Oxidizer		Catalogue reference
	Compressed gas		Date of manufacture
	Corrosive		Use up to
	Toxic		Unique device identifier
	Harmful		Manufacturer
	Health Hazard		Importer
	Environmental Hazard		Entity distributing the medical advice in the region concerned
	No labelling applicable		CE marking device
			In vitro diagnostic medical device
			Authorized Representative in the European Community
			Authorized Representative in Switzerland
			Complies with UK guidelines
			Do not use if packaging is damaged
			Keep away from light
			Temperature limit: 15-25°C
			Temperature limit: 15-30°C
			Keep dry
			Box: handling upwards
			Fragile
			Sterilised by irradiation
			Single sterile barrier system with outer protective packaging
			Sterile and radiation-sterilised barrier suit
			Do not reuse
			Do not resterilize
			Contents sufficient for n tests
			Hazardous material contained
			Consult instructions for use
			Use
			After opening, use within XX months
			The product must not be used in conjunction with an automatic colouring machine
			Indicates a medical device that contains potentially carcinogenic, mutagenic or reprotoxic (CMR) substances, or substances classified as endocrine disruptors

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Changes tracking

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RAL Diagnostics - Site Montesquieu - 33650 Martillac - France
T+33(0)5 57 96 04 04 - F +33 (0)5 57 96 04 55 - ral-diagnostics.fr / cellavision.com