

# GMS Stain Kit

(Modified Gomori Methenamine-Silver Nitrate Stain for Fungus and *Pneumocystis carinii*)


**Description:** The Modified Gomori Methenamine-Silver Nitrate Stain (GMS Stain Kit) is intended for use in the histologic visualization of fungi, basement membrane and some opportunistic organisms such as *Pneumocystis carinii*. *Pneumocystis carinii* is an opportunistic pathogen that causes severe pulmonary disease in humans, dogs, rats, mice and other vertebrate species with acquired, induced, or inherited immune deficiency syndromes. In addition, this procedure will demonstrate *Actinomyces* and related species, *Nocardia* asteroids, and certain encapsulated bacteria.

Fungi: Black  
 P. Carinii: Black  
 Mucin: Gray  
 Mycelia (inner): Rose  
 Hyphae (inner): Rose  
 Background: Light Green


**Uses/Limitations:** For In-Vitro Diagnostic use only.  
 Histological applications.  
 Air-dried smears.  
 Do not use past expiration date.  
 Use caution when handling these reagents.

**Availability/Contents:**

<u>Item #</u>	<u>Kit Contents</u>	<u>Volume</u>	<u>Storage</u>
SNS125	Silver Nitrate Solution (0.2%)	125 ml	2-8° Centigrade
MET125	Methenamine Solution	125 ml	2-8° Centigrade
GCB125	Gold Chloride Solution (0.2%)	125 ml	2-8° Centigrade
BOR015	Borax Solution	15 ml	Room Temperature
SBC125	Sodium Bisulfite Solution	125 ml	Room Temperature
CHR125	Chromic Acid Solution	125 ml	Room Temperature
STB125	Sodium Thiosulfate Solution (5%)	125 ml	Room Temperature
LGA125	Light Green Solution	125 ml	Room Temperature

Storage: 2° C  25° C

**Mixed Storage Conditions.  
 Separate Contents.**

 ScyTek Laboratories, Inc.  
 205 South 600 West  
 Logan, UT 84321  
 435-755-9848  
 U.S.A.

**CE** Authorized Representative in Europe  
 (Regulatory affairs only)  
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Instructions For Use  
KAA-1-IFU

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Revision: 4

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**Precautions:** Chromic Acid is a strong oxidizer. Contact with other material may cause fire. Contact with skin and eyes can cause burns. Harmful if swallowed. Harmful to respiratory and gastrointestinal system. Can cause cancer and birth defects.

Borax solution is irritating to skin, eyes, and respiratory system. Target organs are central nervous system and kidneys. Harmful if swallowed. Possible risk to unborn child.

Handle all components with care, wearing gloves and eye protection.

ScyTek Laboratories may not be held liable for injury due to mishandling.

Follow all Federal, State, and local regulations regarding disposal.

Use in chemical fume hood whenever possible.


**Important Notes:**

1. All glassware used in this procedure should be chemically cleaned and rinsed thoroughly in distilled water.
2. Failure to adequately remove the alcohol used in deparaffination will result in reduction of the chromic acid solution. Reduction of the chromic acid solution will result in a change in color from orange to brown. Discard the reagent if color change is noted.
3. Do not use metal forceps to remove slides from reagents. Use plastic forceps only.
4. Prewarm all reagents to room temperature prior to use.


**Procedure (Standard):**

1. Deparaffinize sections if necessary and hydrate to distilled water.
2. Incubate slide in Chromic Acid Solution for 10 minutes.
3. Rinse in tap water followed by 2 changes of distilled water.
4. Incubate slide in Sodium Bisulfite Solution for 1 minute (to remove any residual chromic acid).
5. Rinse in tap water followed by 2 changes of distilled water.
6. Combine the following for a working GMS solution:  
25 ml Silver Nitrate Solution (0.2%)  
25 ml Methenamine Solution  
2 ml Borax Solution

Note: Mixed solution may not be stored for reuse later.

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7. Place working GMS solution in 60° centigrade water bath and allow temperature to equilibrate.
8. Incubate slide in working GMS solution for 10-15 minutes. Using plastic forceps, dip slide in distilled water and check under a microscope for evaluation of silver impregnation. Fungi should be dark brown. If color is not sufficient, return the slide to working GMS solution for 2-3 minutes and check again.
9. Rinse in 4 changes of distilled water.
10. Incubate slide in Gold Chloride Solution for 15-30 seconds.
11. Rinse in 4 changes of distilled water.
12. Incubate slide in Sodium Thiosulfate Solution (5%) for 2 minutes.
13. Rinse in tap water followed by 2 changes of distilled water.
14. Incubate slide in Light Green Solution for 2 minutes.
15. Rinse in distilled water.
16. Dehydrate through graded alcohols.
17. Clear, and mount in synthetic resin.


### Procedure (Microwave):

*Note: These instructions were developed using a standard 500 watt microwave oven. Heating times should be modified as needed depending on the microwave oven used.*

1. Deparaffinize sections if necessary and hydrate to distilled water.
2. Place slide in plastic coplin jar filled with Chromic Acid solution. Cap jar loosely!
3. Place jar in microwave oven and heat on high power for 10 seconds. Allow slide to remain in warm solution for 3 minutes.
4. Rinse in tap water followed by 2 changes of distilled water.
5. Incubate slide in Sodium Bisulfite solution for 1 minute (to remove any residual chromic acid).
6. Rinse in tap water followed by 2 changes of distilled water.
7. Combine the following for a working GMS solution:
  - 25 ml Silver Nitrate
  - 25 ml Methenamine
  - 2 ml Borax Solution

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Note: Mixed solution may not be stored for reuse later.


8. Place working GMS solution (loosely capped) in microwave oven for 40 seconds. Remove and pour several times between coplin jar and a clear graduated cylinder to mix thoroughly (use protective glove to avoid burning hand). Mixed solution remains in coplin jar.
9. Incubate slide in working GMS solution (heated) for 2-6 minutes until the tissue is medium brown in color. Using plastic forceps, dip slide in distilled water and check under a microscope for evaluation of silver impregnation. Fungi should be dark brown. If color is not sufficient, return the slide to working GMS solution for 1-2 minutes and check again. Reheat solution if needed.
10. Rinse in 4 changes of distilled water.
11. Incubate slide in Gold Chloride solution for 15-30 seconds.
12. Rinse in 4 changes of distilled water.
13. Incubate slide in Sodium Thiosulfate for 2 minutes.
14. Rinse in tap water followed by 2 changes of distilled water.
15. Incubate slide in Light Green Solution for 2 minutes.
16. Rinse in distilled water.
17. Dehydrate through graded alcohols.
18. Clear, and mount in synthetic resin.

### References:

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6. Sheehan, D.C., Hrapchak, B.B. 1980. Theory and Practice of Histotechnology, 2<sup>nd</sup> edition, CV Mosby Company, St. Louis, MO.

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