Department of Microbiology
MUG Disk Test Procedure for β-Glucuronidase

I. Purpose and Test Principle

The MUG disk provides a rapid enzymatic test to aid in the identification of clinical isolates. Certain bacteria produce the enzyme β-glucuronidase. This enzyme hydrolyzes the substrate 4-methylumbelliferyl-β-D-glucuronide (MUG), releasing 4-methylumbelliferone, which fluoresces blue under long-wave UV light.

II. Specimen Information

Only well-isolated colonies should be used for testing. Inoculum should be taken from 24-48 h growth on blood agar.

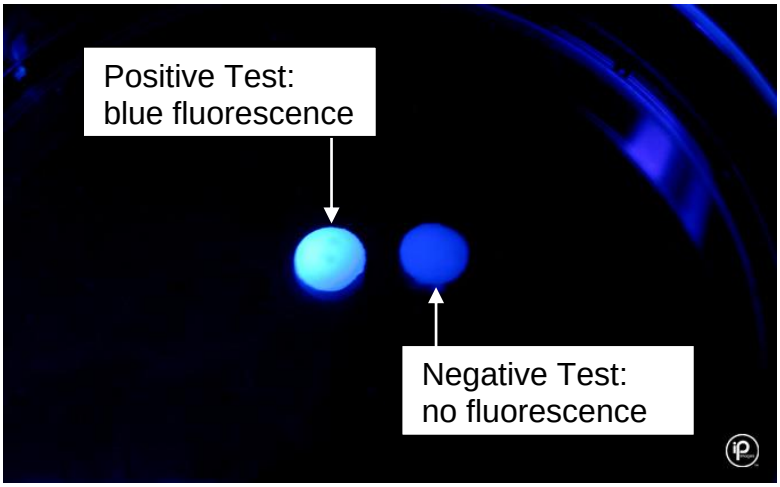
III. Reagents & Equipment

- MUG Disks – Store disks in original vial at 2-8°C. Protect disks from moisture. Do not use product if the disks are no longer white, the expiration date has passed, or if the desiccant has changed from blue to pink.
- Forceps, wooden applicators, petri dish, filter paper, demineralized water
- Aerobic incubator set at 35 ± 2°C
- Long-wave UV light

IV. Procedure

A. Place a MUG disk on the bottom of an empty petri dish or, alternatively, place the MUG disk on the top of the blood agar surface of the primary isolation medium.
B. Smear several colonies on the disk.
C. If the disk is in an empty petri dish, add one drop of water. If the disk was placed on the agar surface it will take moisture from the medium to rehydrate.
D. Incubate aerobically at 35 ± 2°C for up to 30 min.
E. Following incubation, examine the disk for fluorescence using a long-wave UV light (360 nm) in a darkened room.

V. Interpretation



VI. Quality Control

Each new lot or shipment of disks should be examined for product deterioration and tested with the following control strains. Disks showing signs of deterioration or failing to produce expected Quality Control results should not be used for patient testing.

Control strain	Expected Results
E. coli ATCC 25922	Positive: blue fluorescence
K. pneumoniae ATCC 13882	Negative: no fluorescence

VII. Limitations

A. This test is part of an overall scheme of identification. Further biochemical testing may be necessary for definitive identification.

VIII. Verification of Test Method

In order to verify the performance of the MUG disk, a total of 10 strains of *Aerococcus urinae* were tested. These were clinical isolates obtained from and previously characterized by ARUP laboratories. A total of 5 strains of *Klebsiella* spp. were also tested. The *Klebsiella* included *K. pneumoniae* ATCC13882, *K .pneumoniae* ATCC 700603, two clinical *K. pneumoniae* and one *K. oxytoca* isolates. All 10 (100%) of the *A. urinae* strains produced positive results with the MUG disk. Conversely, all 5 (100%) of the *Klebsiella* strains produced negative results.

IX. References

A. Package insert: Remel, IFU 21135, Revised March 1, 2005.

B. Clinical Microbiology Procedures Handbook, 3rd ed. and 2007 update, Vol. 2. Garcia, L.S., editor in chief. ASM Press, Washington, D.C.

C. Indiana Pathology Images: Bacteriology I Image Atlas

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Updates and Revisions: