

Burkholderia mallei

Burkholderia mallei is a nonmotile, aerobic gram-negative coccobacillus, which may or may not be oxidase positive or grow on MacConkey agar. Glanders is an infectious disease that is caused by the bacterium *Burkholderia mallei*. Glanders is primarily a disease affecting horses, but it also affects donkeys and mules and can be naturally contracted by goats, dogs, and cats. Human infection, although not seen in the United States since 1945, has occurred rarely and sporadically among laboratory workers and those in direct and prolonged contact with infected, domestic animals. The disease is diagnosed in the laboratory by isolating *Burkholderia mallei* from blood, sputum, urine, or skin lesions. Serologic assays are not available.

Specimens

- Blood or bone marrow
- Sputum or bronchoscopically obtained specimens
- Abscess material and wound swabs
- Urine

Materials

- Blood and bone marrow cultures can be done using:
 - Standard automated blood culture system
 - Lysis centrifugation system
- Media for isolation from other clinical specimens:
 - Chocolate agar (CHOC)
 - Sheep blood agar (SBA)
 - MacConkey agar (MAC)

Cultures

- Blood cultures - Process according to standard laboratory procedure.
- Respiratory specimens, abscess material/wounds and urine - Plate directly onto SBA and MacConkey agar; enrichment broth can be used for wound/abscess material. For improved isolation, a colistin disk or polymyxin B disk may be placed in the initial inoculation area of the SBA if isolation of *Burkholderia* spp. is specifically requested.

Culture Incubation

- Temperature - 35 to 37°C
- Atmosphere - Ambient; CO₂ acceptable
- Length of incubation - Hold primary plates for a minimum of 5 days; read daily. *B. pseudomallei* will reliably grow with 5 days of incubation from blood cultures, so extended incubation of either broth or plated blood cultures (lysis centrifugation) is not necessary. *B. mallei* will not grow as rapidly as *B. pseudomallei* and may require extended incubation.

Colony Morphology



- Smooth, grey, translucent colonies on SBA at 48 hrs
- Light pink colonies on MAC at 72 hrs or no growth

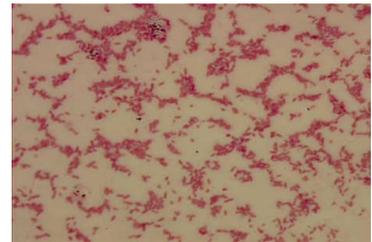
Gram Stain

- Faintly stained gram-negative straight or slightly curved coccobacilli with rounded ends or wavy sides
- Cells are arranged in pairs end-to-end, in parallel bundles or Chinese letter form (1-3 μm x 0.3-0.5 μm)



Biochemical test and reactions

- Catalase = Positive
- Oxidase = Variable
- Indole = Negative
- Motility = Negative
- Triple Sugar Iron (TSI) Agar Slant = Slant: red; Butt: red (no change)
- Colistin/Polymyxin B = Resistant (no zone)



Identification Flow Chart

