

Tests to Differentiate Organisms Similar to the Bioterrorist Agents

Possible Misidentifications for <i>B. anthracis</i> include:	
Organism	Differential Test
<i>B. megaterium</i>	Motility Positive (Note : 16% are non-motile)
<i>B. subtilis</i>	Motility Positive
<i>B. cereus</i>	Hemolytic
<i>B. thuringiensis</i>	Hemolytic and not a human pathogen

Possible Misidentifications for <i>Brucella</i> Include:	
Organism	Differential Test
<i>Haemophilus</i> species (Also will appear as tiny coccobacillus in Gram stain)	Catalase, urease and oxidase variable Will not grow on blood agar. Will demonstrate satellite growth around <i>S.aureus</i> on blood agar, while <i>Brucella</i> growth is present on blood agar, and is not limited to the area around the Staphylococcus.
<i>Oligella ureolytica</i> (Also will appear as tiny coccobacillus in Gram stain, usually found only in the urine) Both this organism and <i>Brucella</i> are catalase, urease and oxidase positive.	<i>O. ureolytica</i> will show delayed motility. Note : Since <i>Oligella</i> has poor motility reaction, it would be better ruled-out with PDA (<i>Oligella</i> is PDA positive and <i>Brucella</i> is PDA negative) which is included in some rapid urea tests. Motility is also not necessary since <i>O. ureolytica</i> is rarely found in the blood or sterile sites where <i>Brucella</i> is more likely to be found. <i>O. Ureolytica</i> is a rare urinary pathogen.
<i>Psychrobacter phenylpyruvicus</i> Both this organism and <i>Brucella</i> are catalase, urease and oxidase positive.	<i>Psychrobacter phenylpyruvicus</i> has plump (not tiny) rods or coccobacillus and is PDA positive
<i>Psychrobacter immobilis</i> Both this organism and <i>Brucella</i> are catalase, urease and oxidase positive.	<i>P. immobilis</i> will prefer to grow at 25°C. May have an odor of roses (however, do NOT sniff cultures). Variable growth on MAC
<i>Bordetella bronchiseptica</i> Both this organism and <i>Brucella</i> are catalase, urease and oxidase positive.	<i>Bordetella bronchiseptica</i> is motile, and <i>Brucella</i> is non-motile. Note: Motility testing is not needed to rule-out <i>Bordetella</i> since <i>B. bronchiseptica</i> grows on MAC, and is a rarely encountered organism in sterile site specimens.
<i>Paracoccus yeei</i> Both this organism and <i>Brucella</i> are catalase, urease and oxidase positive.	<i>P. yeei</i> will appear mucoid on BAP.

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Possible Misidentifications for <i>Burkholderia mallei</i> Include:	
Organism	Differential Test
<i>Burkholderia cepacia</i>	Resistant to amoxicillin-clavulanic acid, lactose fermenter (LF) on MacConkey and EMB, motile, arginine negative
<i>Chromobacterium violaceum</i>	Hemolysis, violet pigment on BAP, motile
<i>Pseudomonas stutzeri</i>	Growth on MacConkey, arginine negative
<i>S. maltophilia</i>	Growth on MacConkey, arginine negative
<i>Bacillus</i> spp. may appear Gram negative	Sensitive to penicillin
<i>Pandoraea</i> spp.	Growth on MacConkey
<i>Ralstonia</i> spp.	Growth on MacConkey

Possible Misidentifications for <i>Burkholderia pseudomallei</i> Include:	
Organism	Differential Test
<i>Burkholderia cepacia</i>	Resistant to amoxicillin-clavulanic acid, lactose fermenter (LF) on MacConkey and EMB, arginine negative
<i>Chromobacterium violaceum</i>	Hemolysis, violet pigment on BAP
<i>Pseudomonas aeruginosa</i>	Colony morphology, grape odor (do NOT sniff plates)
<i>Pseudomonas stutzeri</i>	Arginine negative, susceptible to polymyxin B
<i>S. maltophilia</i>	Arginine negative

Possible Misidentifications for <i>F. tularensis</i> include:	
Organism	Differential Test
<i>Acinetobacter</i> spp.	MAC positive, oxidase negative
<i>Aggregatibacter</i> spp.	Catalase positive β-lactamase negative
<i>Haemophilus</i> spp.	Oxidase positive, requires X & V factors
<i>H. influenzae</i>	Satellite or XV positive
<i>Bordetella</i> Grp. IV	Inert, urea positive
<i>Pasteurella</i> spp.	Non-sticky, MAC positive
<i>Dysgonomonas</i> spp.	Colonies measure 1 to 2 mm in diameter after 24 h of growth, have a distinct strawberry-like odor
<i>Brucella</i> spp.	Oxidase, urea and catalase positive
<i>Psychrobacter phenylpyruvicus</i>	Oxidase positive
<i>Oligella ureolytica</i>	Oxidase positive

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Possible Misidentifications for <i>Yersinia pestis</i> Include:	
Organism	Differential Tests
<i>Acinetobacter</i> spp.	May appear as gram-negative coccobacilli, often in pairs Glucose non-fermenter Colony morphology
<i>E. coli</i> , lactose-negative	Faster growth rate Indole positive (80 %) Colony morphology
<i>Pantoea</i> (formerly <i>Enterobacter</i>) <i>agglomerans</i>	Faster growth rate May produce yellow pigment ONPG positive (90%)
<i>Pasteurella multocida</i>	Faster growth rate Oxidase positive (may be weak) Indole positive Colony morphology, may appear mucoid
<i>Pseudomonas luteola</i>	May produce yellow pigment Glucose non-fermenter
<i>Pseudomonas</i> spp.	Oxidase positive (except <i>P. luteola</i> & <i>P. oryzihabitans</i>) Glucose non-fermenter
<i>Shigella</i> spp.	Faster growth rate Colony morphology Shigella antisera
<i>Salmonella</i> spp., H ₂ S-negative	Faster growth rate Colony morphology Salmonella antisera
<i>Yersinia enterocolitica</i>	Small gram-negative coccobacilli Urease positive* Indole variable
<i>Yersinia pseudotuberculosis</i>	Urease positive*

** *Y. pseudotuberculosis* and *Y. enterocolitica* give stronger reactions in urea agar or broth when incubated at 25 -28°C, but incubation at this temperature is not necessary to demonstrate urease production.