**Neisseria meningitidis and N. gonorrhoeae (and M. catarrhalis)**
Chocolate, BAP, & Nutrient agar needed for good identification

In original specimen:
Gram negative diplococci, some intracellular

**Three types of Gram negative diplococci possible**
- M. gonorrhoeae is pathogen in genital and throat sites, rarely joint fluid
- M. meningitidis is pathogen in CSF, blood, rare genital (anal) and sputum
- M. catarrhalis is pathogen in sputum, ear, eye, sinus aspirate only

All 3 major Gram neg diplococci grow well on chocolate agar
N. meningitidis and Moraxella catarrhalis grow on BAP and nutrient agar
M. catarrhalis grows at 22°C on BAP; N. meningitidis does not

All 3 species oxidase +

N. meningitidis in blood
GC or Moraxella on Choc
N. mening grows on Choc & BAP
M. cat & N. men. grow on BAP
M. catarrhalis on Choc NOT TM

Gram negative diplococci from colony
M. catarrhalis is Butyrate +

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Acinetobacter baumannii complex

Can be a pathogen in any site

- Smooth round colonies on BAP
- Non-lactose fermenters (purple) on MacConkey
- Non-hemolytic
- Fish-like smell
- Oxidase negative
- Indole negative

Gram – or Gram variable coccobacilli. Tends to stain Gram positive in original specimens.

Colonies resemble Enterobacteriaceae on BAP but are blue-purple on MacConkey.

Gram – coccobacilli from colonies

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**Brucella**
Pathogen in blood, lymph nodes, bone marrow

- Do not grow on MacConkey
- Non-hemolytic, slow-growing colonies
- Catalase positive
- Oxidase positive
- Indole negative
- Rapid positive urease

**Pasteurella multocida**
Pathogen in bite wounds, blood

- Regular Gram-negative rod
- Do not grow on MacConkey
- Non-hemolytic, good growth on BAP
- Catalase positive
- Oxidase positive
- Indole positive - rapid
- Urease negative
- Smells like bleach

Gram – or Gram variable short rod. Tends to stain Gram positive in original samples.

Colonies resemble Enterobacteriaceae on BAP but do not grow on MacConkey

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**Burkholderia pseudomallei**

Major pathogen in pneumonia, abscesses, skin lesions, blood cultures

- Rough colony on BAP
- Strong musty smell
- Bipolar-stain Gram - rod
- Catalase +
- Oxidase +
- B. cepacia: smooth, pale greenish colonies on BAP

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>pseudomallei</th>
<th>cepacia</th>
<th>Pseudo. stutzeri</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wrinkly colony</td>
<td>+</td>
<td>Neg</td>
<td>Later</td>
</tr>
<tr>
<td>Polymyxin &amp; Gentamicin</td>
<td>R</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Arginine dihydrolase</td>
<td>+</td>
<td>Neg</td>
<td>Neg</td>
</tr>
<tr>
<td>Musty odor</td>
<td>+</td>
<td>Neg</td>
<td>Neg</td>
</tr>
</tbody>
</table>

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**Bacillus sp.**

Major pathogen: *Bacillus anthracis*

Others only in immunocompromised patients from several blood cultures

- Catalase +
- Possible *Bacillus anthracis*
  - Very fast growing
  - Non-hemolytic
  - Colony sticks together
  - Non-motile

Regular Gram + rods & spores (do not stain)

Numerous colony morphologies (hemolytic & non-hemolytic)

*B. anthracis* from broth – central spores “string of pearls”

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**Listeria monocytogenes**

Major pathogen in CSF and Blood only

- CSF showing PMNs, Monocytes, & Gram positive rods (may be intracellular)
- Beta hemolysis does NOT extend beyond edge of colony
- Colony looks like Group B streptococci. Differentiate from Group B strep by Gram stain and positive catalase reaction
- Regular Gram + rods May be short or longer
- Motility:
  - Tumbling motility at 26°C
  - Non-motile at 35°C

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Yeast on sheep blood agar
Not a pathogen except in vaginal cultures and blood; rarely other sources

- If FEET, it is Candida albicans
- If NO feet, can be Candida albicans or other yeast → perform germ tube test
- Candida (Torulopsis) glabrata grows poorly on BAP – tiny colonies on first day
- Yeast CAN grow on MacConkey

48 h growth on Mac

Germ tube +

Pinched off tubule: NOT germ tube +

• Colony opaque white to yellow
• Catalase +
• Non-hemolytic
• Often confused for staph → make Gram stain!
• Mucoid yeast may be Cryptococcus (white) or Rhodotorula (pink)
• Cryptococcus show capsule in India Ink, pink halo on Gram stain, urease pos

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