

Foundational Training for the Entry-level Clinical Microbiologist Part One: Basic Skills



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Wisconsin Clinical Laboratory Network
Laboratory Technical Advisory Group

The presenter states no conflict of interest and has no financial relationship to disclose relevant to the content of this presentation.

WHY WE'RE HERE

- I. Erin Bowles
- II. Sean McGee Hicks
- III. Provide foundational training in entry-level clinical microbiology laboratory skills
- IV. Extrapolate these skills toward understanding of CLSI M35-A2



STAY
TUNED

OBJECTIVES

1. Recognize important colony morphologies and discern hemolytic patterns that can triage bench-level workup of commonly encountered patient isolates;
2. Correlate important colony morphology with cell morphology;
3. Appreciate nuances in cell morphology that can direct the microbiologist toward a specific diagnostic algorithm; and,
4. Identify biochemical screening tests that can further assist in ultimate identification of patient isolates

February

SPOILER ALERT

Foundational Training for the Entry-level Clinical Microbiologist Part Two: CLSI M35-A2 Document for Same-day Identification of Bacteria and Yeast



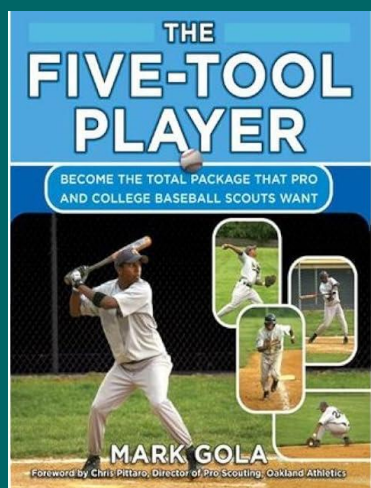
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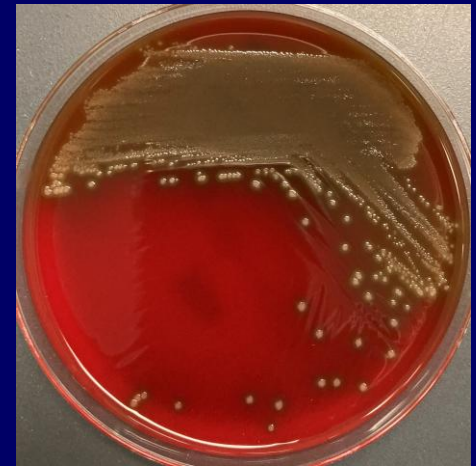


Skills

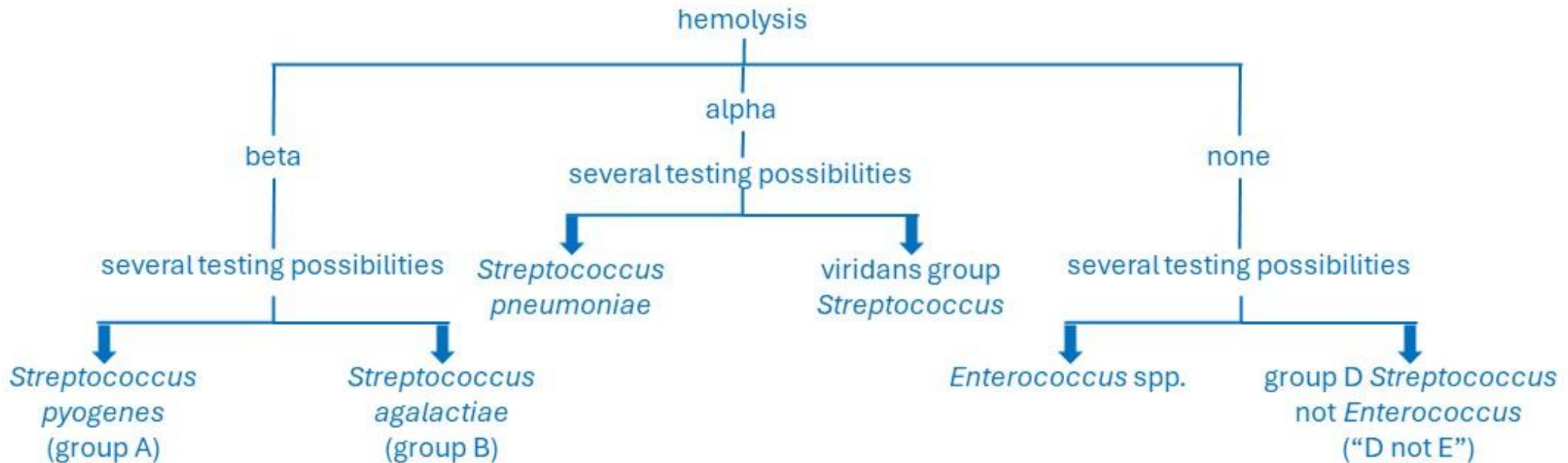


HEMOLYSIS

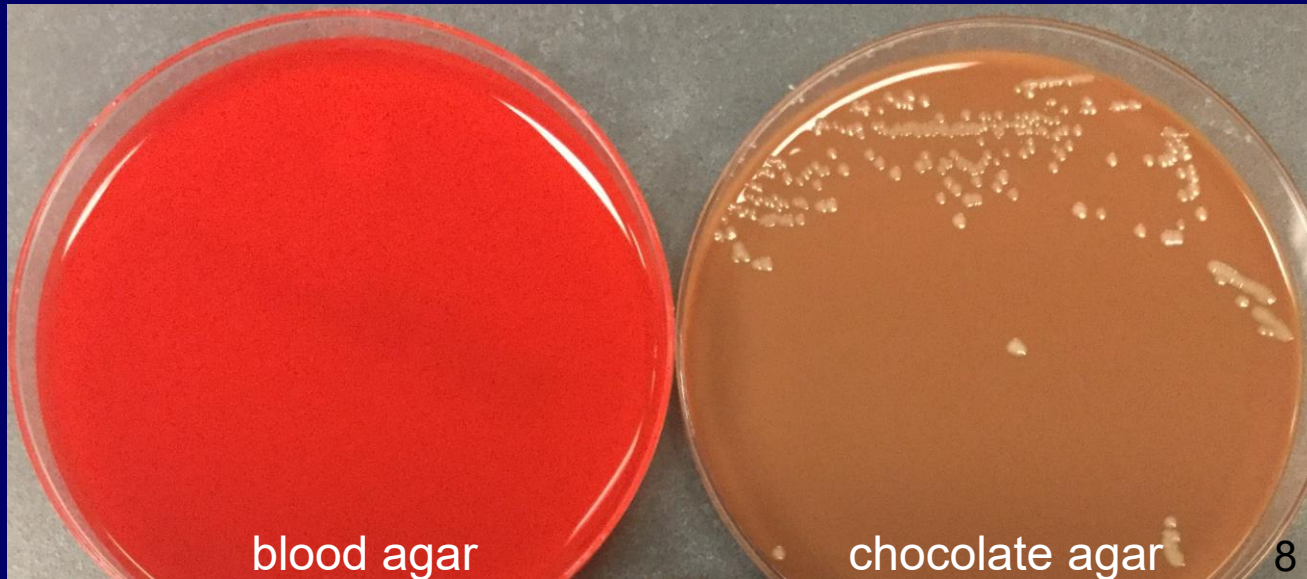
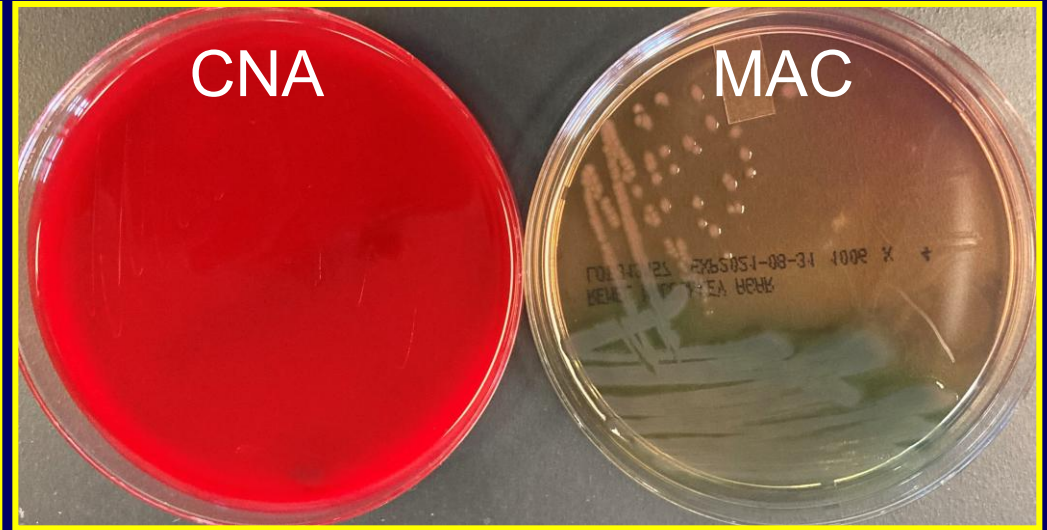
- Beta → complete destruction
- Alpha → partial destruction
- Non (gamma) → no destruction



WHY CAN THIS BE IMPORTANT?



GROWTH DISTRIBUTION



WHY CAN THIS BE IMPORTANT?

- Predict Gram reaction
- Zero in on potential culprits

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- Predict Gram reaction
- Zero in on potential culprits

Genus	Growth Rate	Blood agar	Chocolate agar	MacConkey agar	Fun Fact(s)
<i>Haemophilus</i>	overnight	no growth	growth	no growth	M35-A2
<i>Pasteurella</i>	overnight	growth	growth	no growth	sick TSI, penicillin
<i>Gardnerella</i>	overnight	growth	growth	no growth	teeny tiny
<i>Brucella</i> (nasty one)	two days	growth	growth	no growth	BSC, rule-out
<i>Francisella</i>	two days	no growth*	growth	no growth	BSC, rule-out
<i>Acinetobacter</i>	overnight	growth	growth	growth	non-motile, K/NC

“CLASSIC” COLONY FEATURES

- Pigment

Everything seems to be gray
Gray vs. white



“CLASSIC” COLONY FEATURES

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Everything seems to be gray

Gray vs. white

White vs. gold



“CLASSIC” COLONY FEATURES

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Everything seems to be gray

Gray vs. white

White vs. gold

Gold vs. bright yellow vs. yellow



“CLASSIC” COLONY FEATURES

● Pigment



● Size



“CLASSIC” COLONY FEATURES

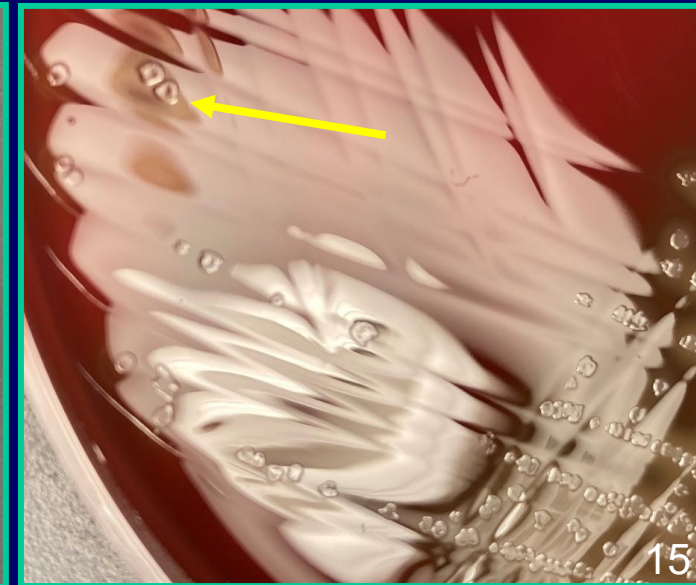
● Pigment



● Size



● Texture



“CLASSIC” COLONY FEATURES

- Pigment

- Size

- Texture

- Feet



“CLASSIC” COLONY FEATURES

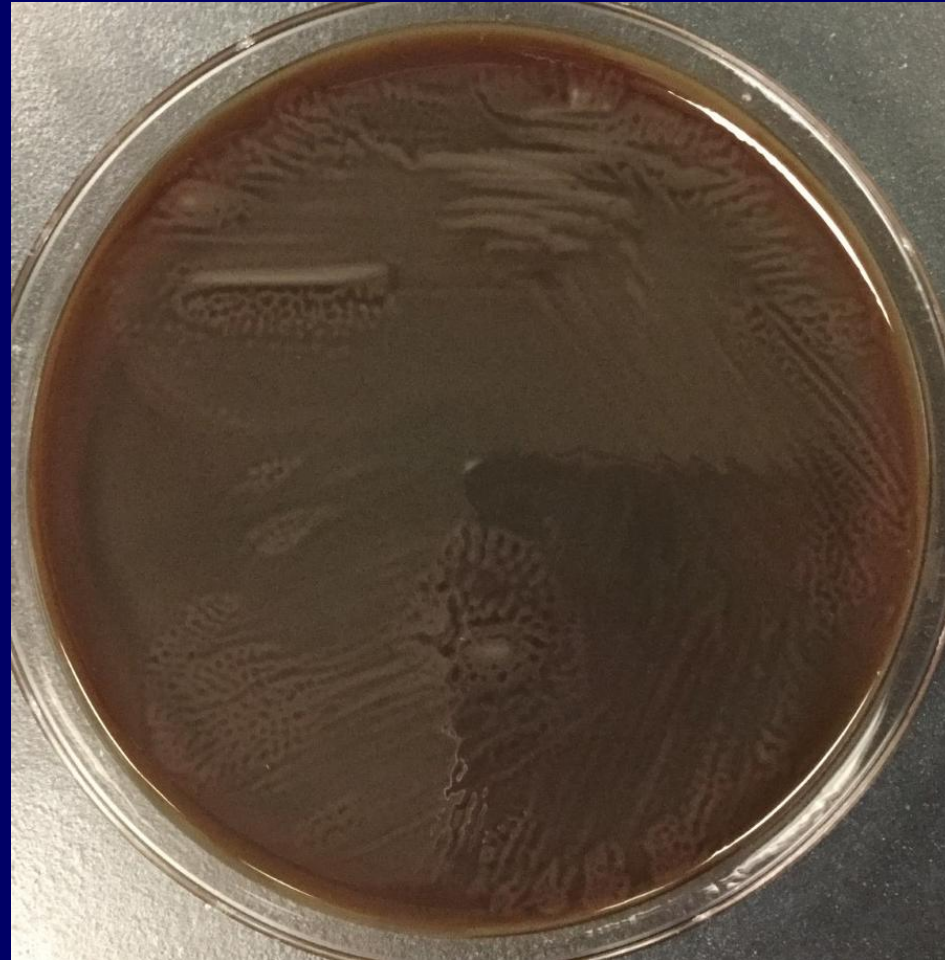
- Pigment

- Size

- Texture

- Feet

- Swarm



“DEMO” COLONY FEATURES

- Pigment

- Size

- Texture

- Feet

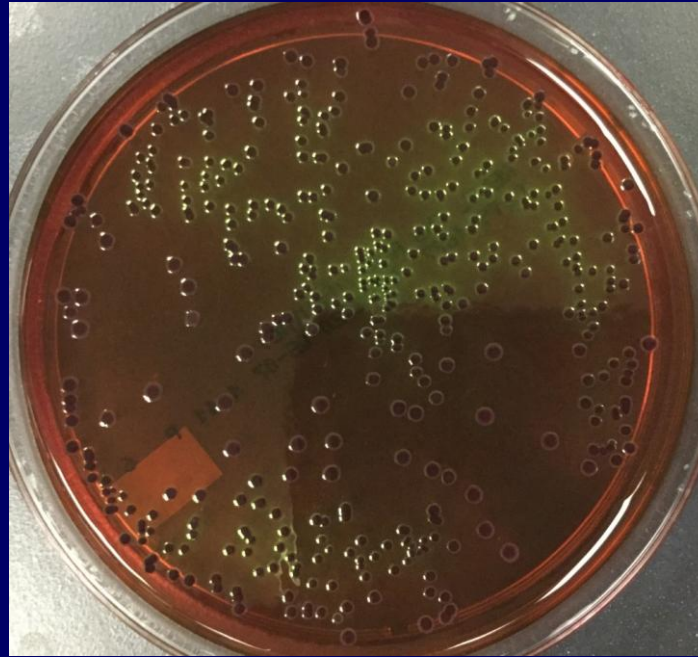
- Swarm

DIFFERENTIAL MEDIA

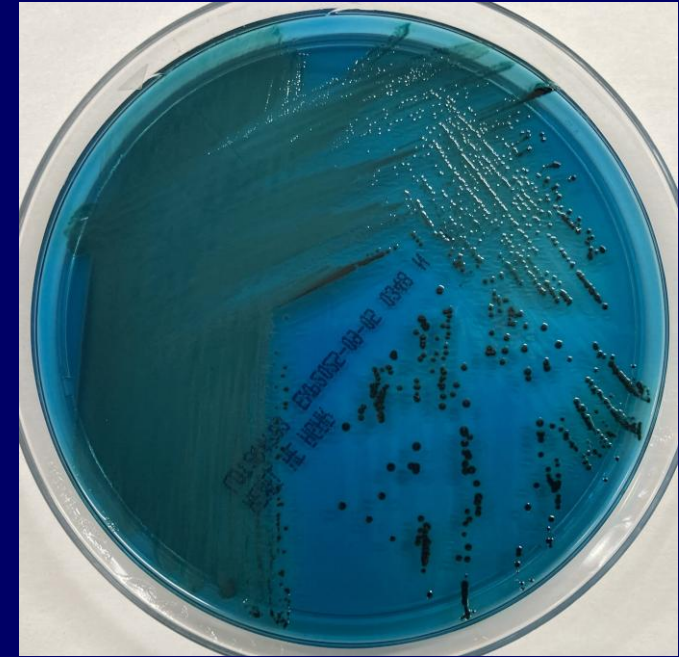
- Munchie, pH indicator
- Interactive...



MacConkey agar



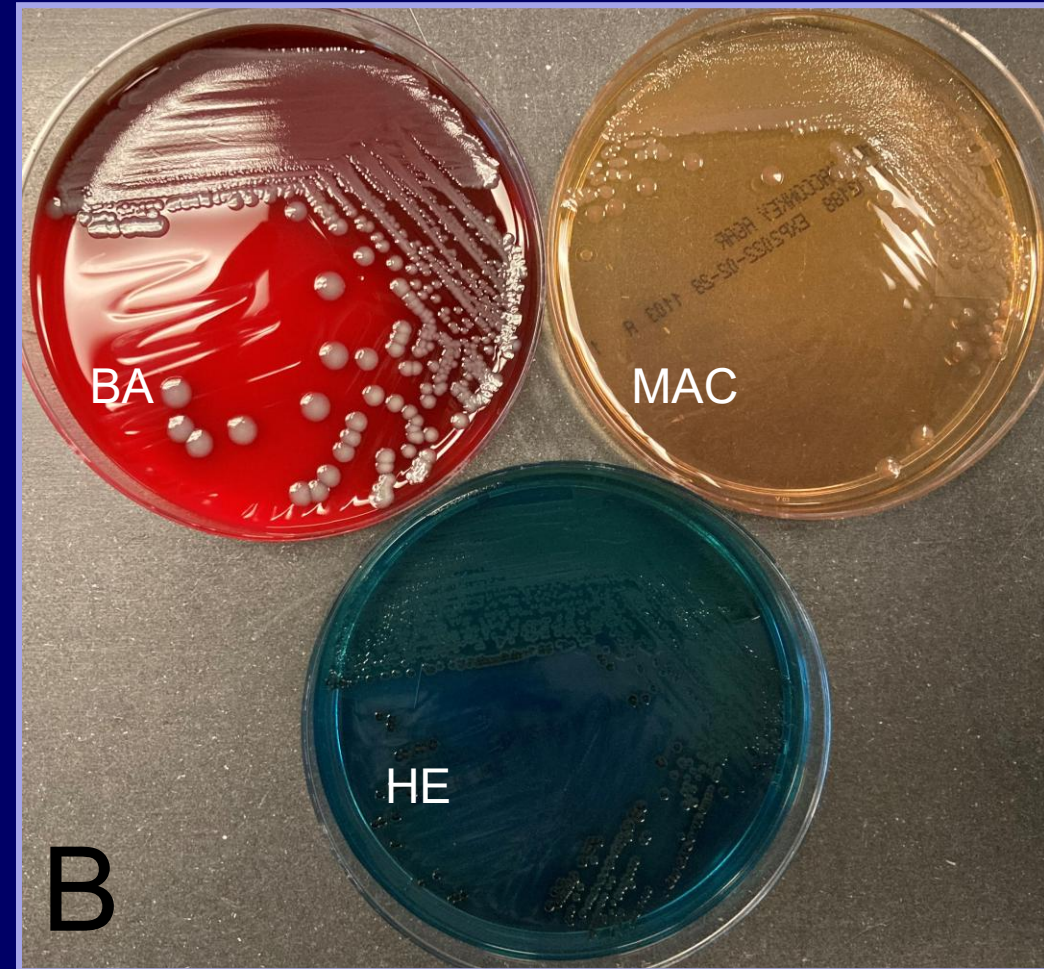
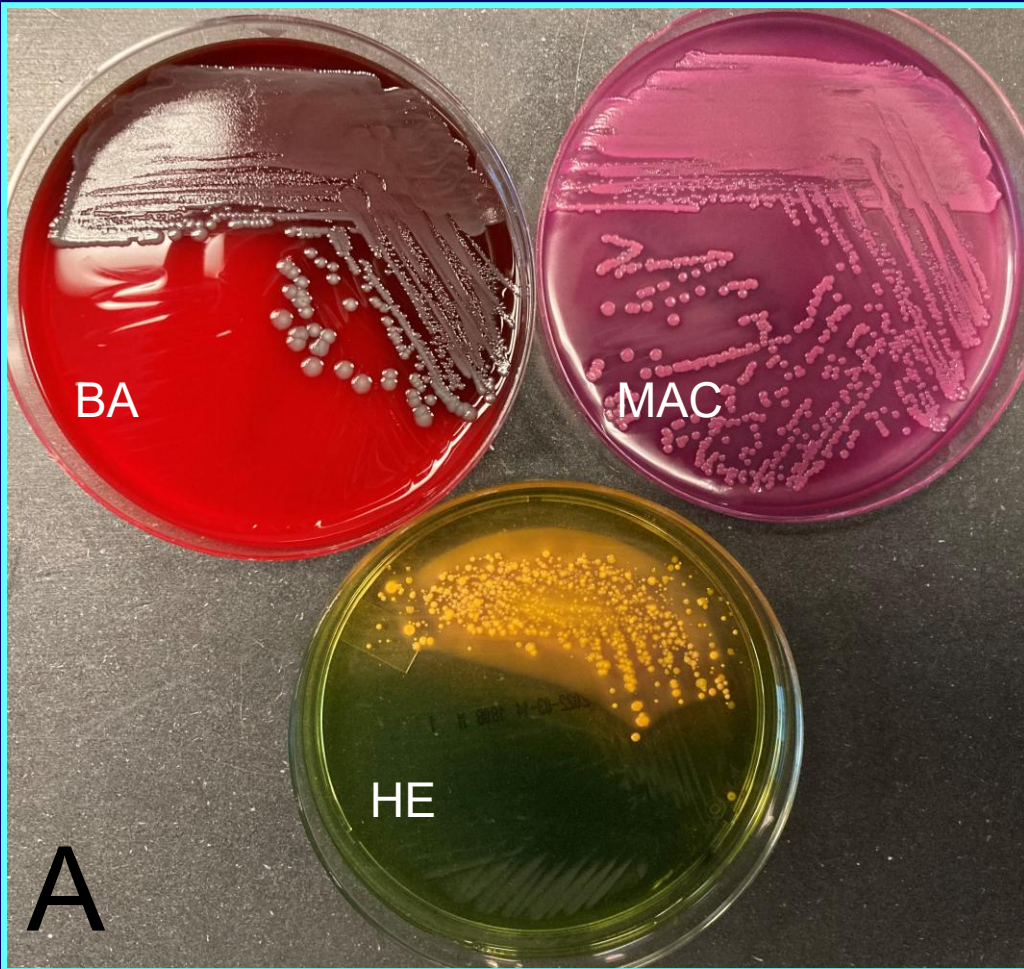
Eosin methylene blue agar



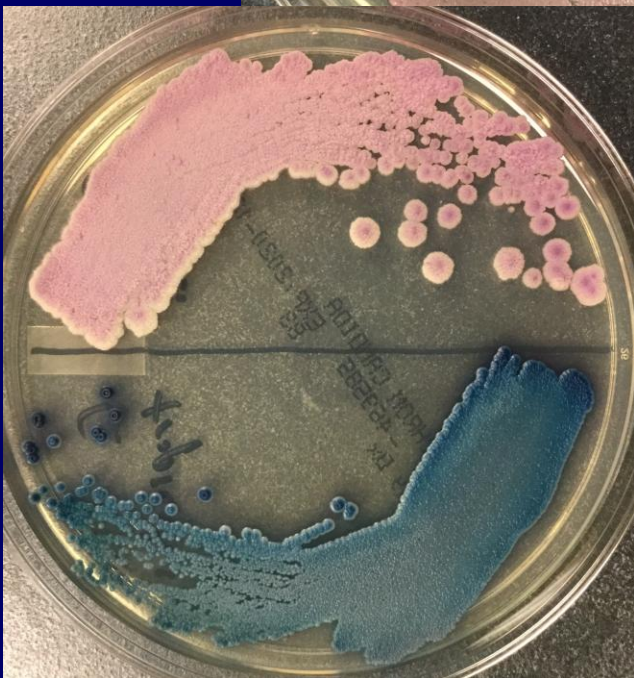
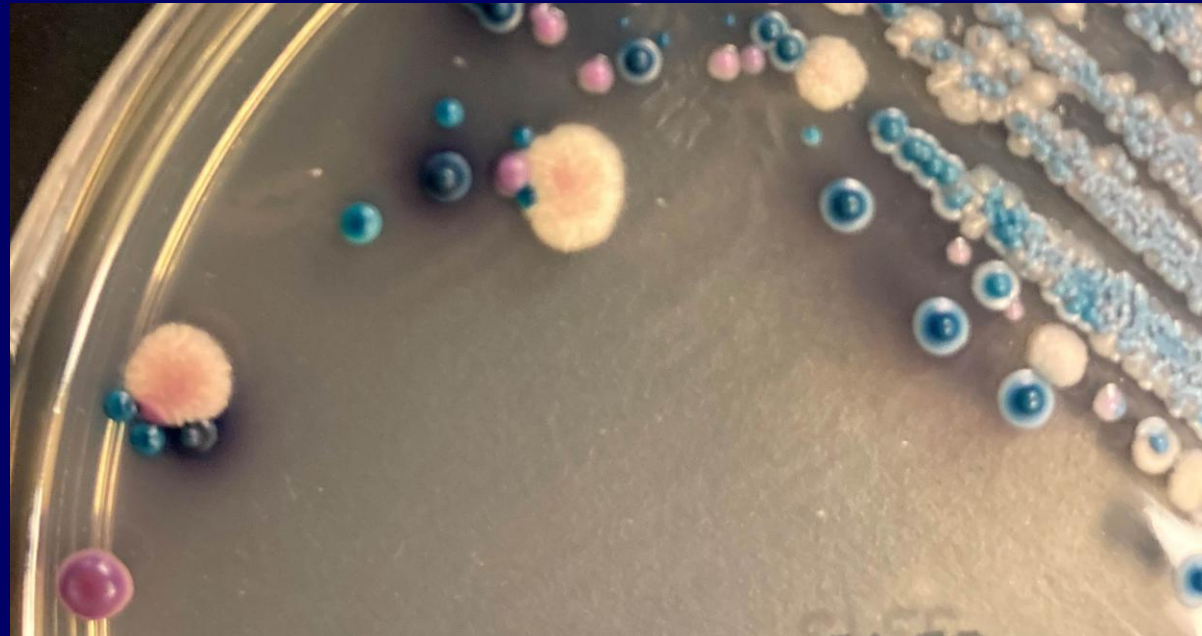
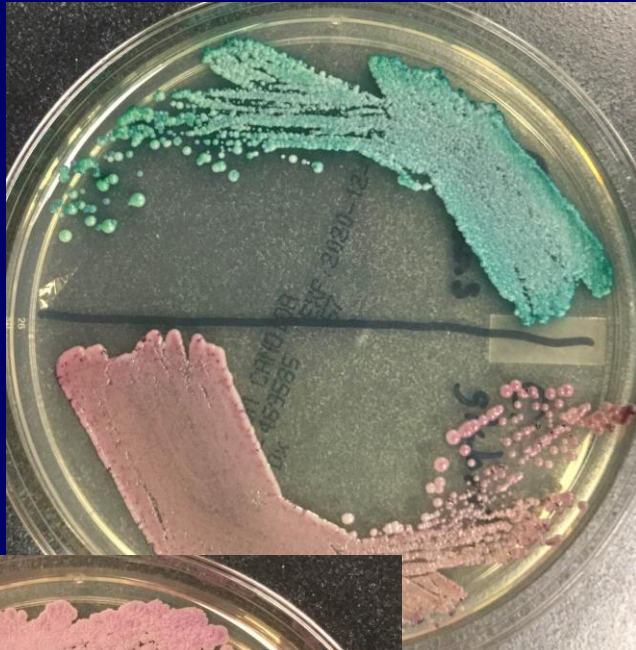
Hektoen enteric agar

DIFFERENTIAL MEDIA

- Munchie, pH indicator; **often with selective**

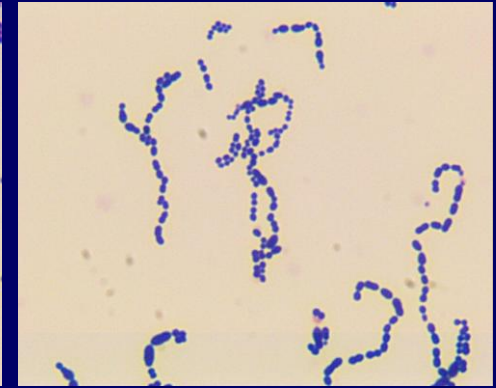
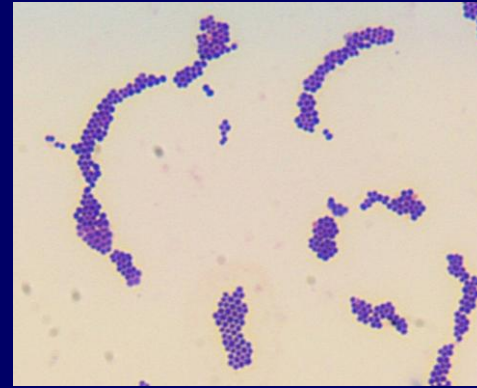


CHROMOGENIC MEDIA

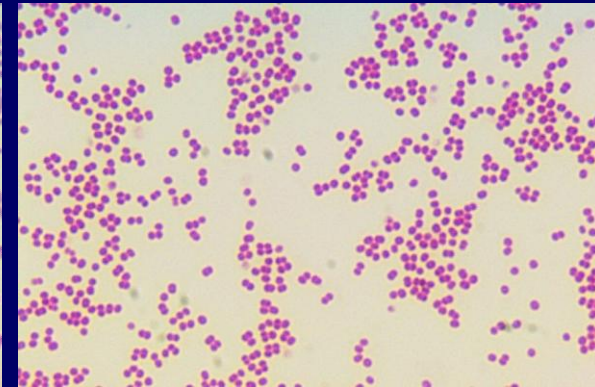


GRAM STAIN IDIOSYNCRACIES

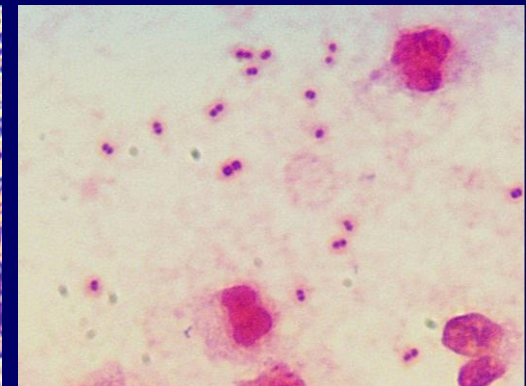
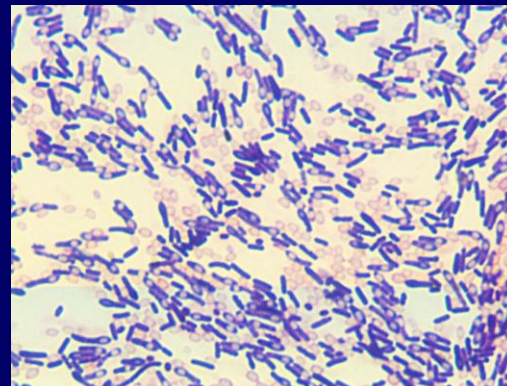
○ Clusters vs. chains



○ Coccobacilli vs. diplococci



○ Spores vs. capsules



IS IT REAL?

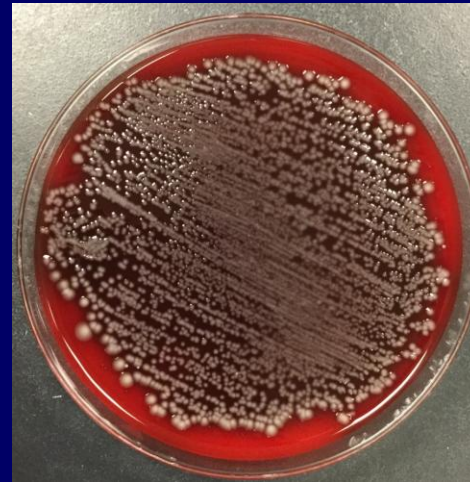
- The “no brainers” (especially with inflammation)



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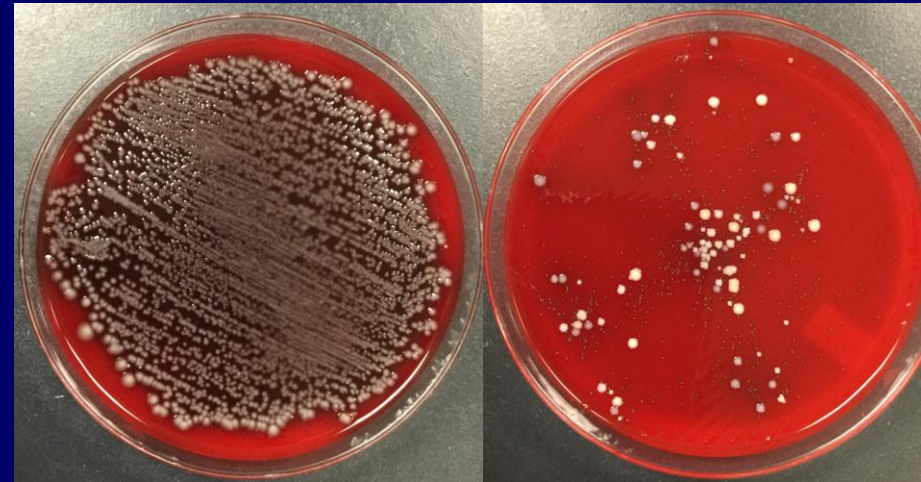
- Predominant organism



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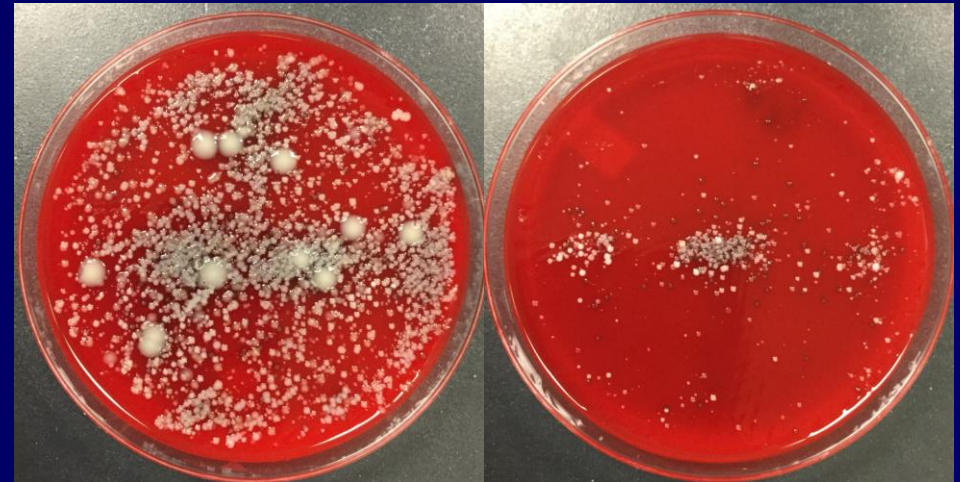
- The “no brainers” (especially with inflammation)

- Predominant organism



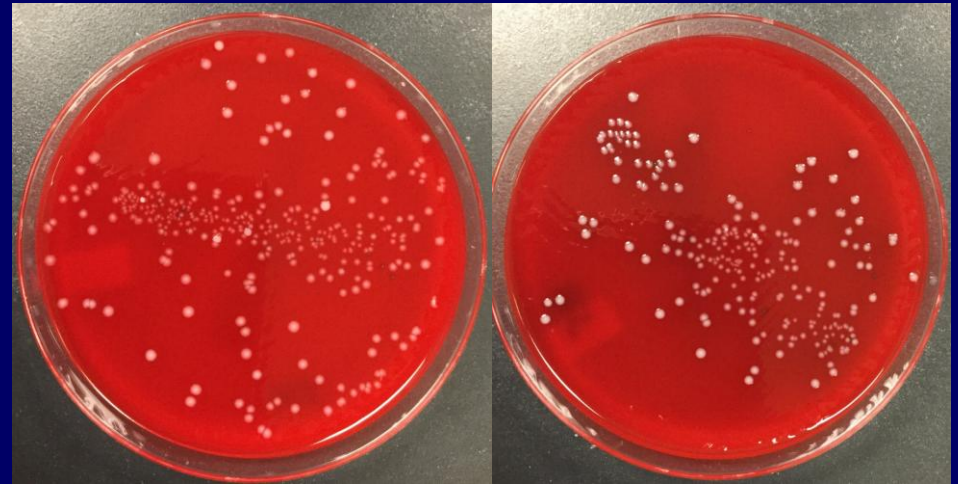
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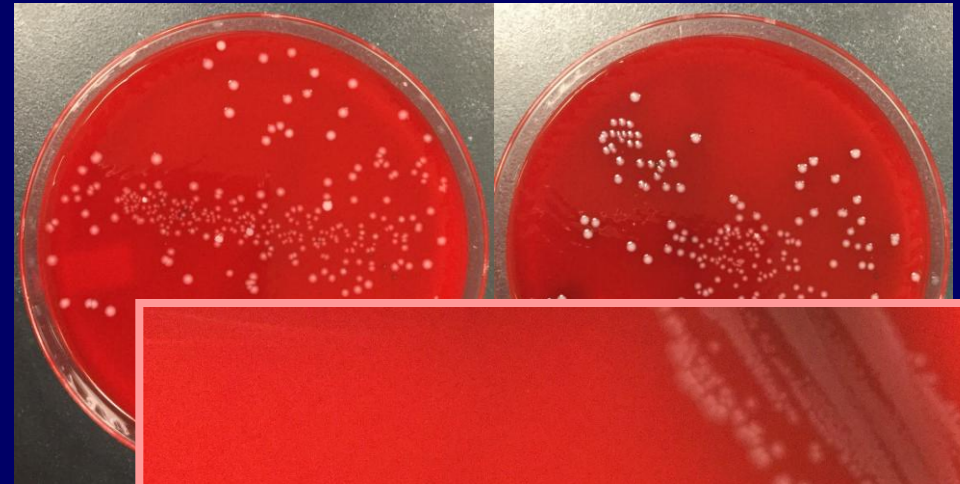
IS IT REAL?

- The “no brainers” (especially with inflammation)
- Predominant organism
- Targeted organisms (per specimen source)



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- Predominant organism
- Targeted organisms (per specimen source)



IS IT REAL?

- The “no brainers” (especially with inflammation)
- Predominant organism
- Targeted organisms
(per specimen source)
- Check your policies and procedures



Acknowledgments

Jim Hermanson

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