22.3: Chromogenic Media

Introduction

HardyCHROM Chromogenic Media are one brand of a type of new media developed to improve identification of certain bacteria. These media utilize chromogens (colorless molecules that can be oxidized to colored compounds) that convert to different colors when degraded by different microbial enzymes. The media were first developed primarily for the rapid detections of MRSA (Methicillin Resistant *Staphylococcus aureus*), an important drug resistant bacterium frequently occurring in hospitals and more recently in the general population.

Additional chromogenic media have been developed for a variety of important clinical isolates and pathogens especially drug resistant microbes: *E. coli*, *Candida*, *Salmonella*, *Shigella*, *enterococci*, etc.

HardyCHROM UTI

This media is used specifically for the isolation and differentiation of urinary tract pathogens.

Urinary tract infections are very common, and one of the most common hospital acquired infections. Thus they are a leading cause of prescribing antibiotic treatment (1). It is important to have efficient ID of potential pathogens for timely and correct antibiotic treatment, especially in the case of antibiotic resistant organisms.
Figure \(\PageIndex{1}\): HardyCHROM UTI Agar; two enteric bacteria. K.C.Burke CC-BY-NC SA

The media is streaked directly from a urine specimen, which might contain a variety of organisms. The media helps reduce the time of diagnosis and the identification of multiple organisms at once. Typically, urine specimens are grown on Blood Agar and MacConkey agar plates (or bi-plates). Although BAP/MAC plates are somewhat differential, chromogenic plates are being used increasingly in labs.

(Not available during the unknowns)

Materials

- Gloves
- 1 HardyCHROM UTI plate/group
- 1 Unknown mixed broth culture

Procedures

Each group will perform isolation streaks from two mixed bacterial cultures onto 2 separate HardyCHROM UTI plates. The cultures represent urine samples collected from patients. Students should wear gloves to mimic the correct procedure in handling patient specimens in the clinical laboratory. Isolated colonies are necessary for the correct identification of the bacteria.

1. Groups will streak the mixed broth onto the plate:
2. Plates are sensitive to light, so incubate the plates immediately after streaking.
3. After incubation evaluate the plates according to colony color.

Results

Utilize the descriptions and color charts provided in lab to evaluate the plates.
<table>
<thead>
<tr>
<th>Plate #/isolate</th>
<th>Isolation achieved?</th>
<th>Color</th>
<th>Your Identification</th>
<th>Correct ID from the key</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isolate 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isolate 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Post-lab Questions**

1. Did your group achieve isolation of the 2 organisms? If not, what might be some reasons that isolation wasn’t achieved?
2. Why is isolation so important?
3. Is this medium a selective medium? Why or why not?
4. According to the Hardy IFU handout and your results, would there be any additional tests that should be done on the bacteria you isolated? [https://catalog.hardydiagnostics.com/cp_prod/content/hugo/HardyCHROMUTI.pdf](https://catalog.hardydiagnostics.com/cp_prod/content/hugo/HardyCHROMUTI.pdf)
5. Overall, how well did your group do at isolating and identifying your specimens?
6. “A colony count greater than or equal to 103 colony-forming units per mL of a uropathogen is diagnostic of acute uncomplicated cystitis. However, studies have shown that more than 102 colony-forming units per mL in women with typical symptoms of a UTI represent a positive culture.([https://www.aafp.org/afp/2011/1001/p771.html](https://www.aafp.org/afp/2011/1001/p771.html))”(2). Based on this, is it possible to diagnose a urinary tract infection from the method we did in lab using the HardyCHROM media?

**Conclusion**

In your own words, explain the mechanism behind chromogenic media (how it works), and why it is helpful in a clinical situation.

**Resources**

3. HardyChrom UTI: [https://catalog.hardydiagnostics.com/cp_prod/content/hugo/HardyCHROMUTI.pdf](https://catalog.hardydiagnostics.com/cp_prod/content/hugo/HardyCHROMUTI.pdf)
Contributors and Attributions

- Kelly C. Burke (College of the Canyons)