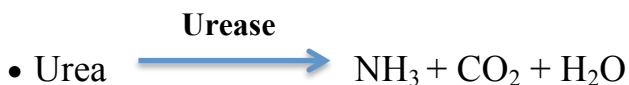


Selective and Differential Media

- TSA, Nutrient agar, and Luria-Bertani (LB) are all examples of enrichment media.
- They are designed to provide the nutrients needed to support the growth of microbes.
- Media can contain selective agents that will result in media that is specific for certain microorganisms.
- Selective: The media “selects” for a specific bacteria or type of bacteria and the media usually inhibits the growth of other bacteria.
- Usually, a selective agent works by inhibiting growth of the unwanted organisms.
 - Examples of selective media include azide agar and sodium chloride agar or broth.
- Differential: The media allows you to distinguish between different groups of bacteria. It is commonly seen as a color change in the media or “zones” of clearing.
- Color change and zones of clearing or inhibition are not the only ways that media can be differential. Hemolytic reactions like that exhibited by *Staphylococcus aureus* on Blood Agar is a differential reaction.
- Other examples of differential media include starch agar and skim milk agar.
- There are media which are both selective and differential.
- Examples of these media types are Eosin Methylene Blue Agar, MacConkey Agar, and Bile Esculin Agar.

Urease

- This is a test that identifies bacteria that can degrade urea using the enzyme urease.
- Urea agar contains phenol red as a pH indicator.
- Remember:
 - Acids= phenol red turns yellow
 - Neutral= phenol red remains peach-like (or slightly peach-pink)
 - Bases= phenol red turns hot pink/fuschia



Russell Double Sugar

- This medium is used to differentiate Gram-negative enteric bacilli on the basis of their ability to ferment dextrose and lactose (with or without gas formation).
- It contains phenol red as its pH indicator
- The butt of the slant and the slant surface are both used in determining the unknown organism.

Bile Esculin Agar

- Bile esculin agar is a medium used to identify group D streptococci and enteric bacteria. These groups of bacteria have the ability to grow in the presence of bile, an emulsifying agent produced in the liver. They also have the ability to hydrolyze esculin. This hydrolysis of esculin turns the medium black and denotes a positive test. Other bacteria capable of growing in the presence of bile do not turn the medium black. A variation of this medium uses sodium azide to inhibit the growth of all other Gram-positive bacteria

and Gram-negative bacteria.

- Bile esculin agar comes in a slant form. It is 2 tests in one---resistance to 40% bile **AND** the use of the sugar esculin. Bile is a very inhibitory chemical, particularly at that concentration. **IF** the bacterium grows, the next question is whether it uses the esculin.
- The enzyme that is present that breaks down the esculin is called esculinase.
- The slant is inoculated in the “serpentine” fashion as was learned early in the semester.

Blood Agar

- TSA base with 5% sheep blood
- Differential test that checks for the presence or absence of exotoxins called hemolysins
- These exotoxins will destroy red blood cells and are produced by several species of Gram-positive cocci
- The major hemolytic reactions are: α -hemolysis, β -hemolysis, and γ -hemolysis.
 - γ -hemolysis exhibits no hemolysis
 - α -hemolysis exhibits a partial or incomplete hemolysis
 - β -hemolysis exhibits a total or complete hemolysis