**EOSIN METHYLENE BLUE AGAR (EMB)**

EMB agar, a **differential & selective** plating medium, is recommended for the detection and isolation of the **gram-negative** intestinal pathogenic bacteria.

The combination of eosin and methylene blue as indicators gives sharp and distinct differentiation between colonies of lactose fermenting organisms and those which do not ferment lactose.

The contents of this medium include peptone, lactose, sucrose, dipotassium phosphate, agar, eosin and methylene blue.

Today EMB agar is one of the most frequently used agars to **detect bacteria found in urine specimens**, especially *E. Coli*.

Obviously both organisms are gram-negative. Remember EMB agar inhibits the growth of gram-positive organisms.

**NUTRIENT AGAR**

Nutrient agar is recommended as a general culture medium for the cultivation of the majority of the less fastidious microorganisms, as well as a base to which a variety of materials are added to give selective differential, or enriched media.

Today this media is gradually begin replaced by Tryptic Soy agar, however, it is included in this demonstration on media since this is on the media you will be inoculating in next week’s lab. Tryptic Soy agar is basically the same, however, a greater number of organism can be grown on it.

Nutrient agar is used for the ordinary routine **examinations of water, sewage, and food products**; for the carrying of stock cultures; for the preliminary cultivation of samples submitted for bacteriological examination; and for isolating organisms in pure culture.

The basic ingredients of Nutrient agar include beef extract, peptone and agar.

**CHOCOLATE AGAR**

Chocolate agar is recommended for the cultural isolation of *Neisseria gonorrhoeae* from chronic and acute cases of gonorrhoea in the male and female and in other gonococcal infections. This medium permits excellent growth of the gonococcus without overgrowth by contaminating organisms when a substance called Isovitales or VX is added. This medium can therefore be classified as a **SELECTIVE MEDIUM**.
Chocolate agar is also used for isolation of Hemophilus influenzae.

The agar itself is an agar to which blood or hemoglobin has been added and heated until the medium becomes brown or chocolate in color. Other ingredients include cornstarch, peptones, dipotassium phosphate and salt.

**MANNITOL SALT AGAR**

Mannitol salt agar is a selective and differential medium for the isolation of pathogenic staphylococci, especially when contamination of the specimen by other bacterial is high (e.g. fecal sample).

The contents include proteose peptone, bacto-beef extract, difco mannitol; bacto-phenol red, sodium chloride and bacto- agar. The phenol red acts as an indicator of pH change. At a pH of 7.4 and above, the agar is pink. When acid is added the pH drops and when it passes through 7.4 it turns yellow.

The staphylococci are facultative anaerobes, which ferment various carbohydrates to acids (usually lactic acid). Pathogenic strains of Staphylococcus aureus will ferment mannitol to lactic acid, hence these organisms will cause the mediums to turn yellow. Other strains of staphylococci will leave the medium its original pink color.

Other bacteria, besides Staphylococcus sp., are usually inhibited by the heavy slat content of the medium thus explaining the selective properties of the medium.

**SABOURAUD AGAR (SAB)**

A Sabouraud dextrose agar with neutral reaction for culturing pathogenic fungi, with the final pH of 7.0 at 25° C.

**THIOGLYCOLLATE MEDIUM**

Thioglycollate medium is a carbohydrate- free medium for cultivation of anaerobes. Carbohydrates can be added to the medium for studying the fermentation reaction of anaerobic microorganisms. (Note these anaerobes will not grow in the presence of oxygen).

The contents of Thioglycollate medium include yeast extract, casitone, L-cystine; thioglycollic acid, agar, sodium chloride and methylene blue (if an indicator is present).

If an indicator is added a colored zone will appear in the medium indicating the presence of oxygen. Anaerobic bacterial will not grow in this area.
This medium can be classified as SELECTIVE since it is mainly for the cultivation of anaerobes, however, it should be noted that other bacteria can grow in the zone where oxygen occurs.

LOWENSTIEN-JENSEN MEDIUM

Lowenstein-Jensen medium is recommended for the cultivation of Mycobacterium tuberculosis and other species of Mycobacterium.

The contents of this medium include water, eggs, asparagines (an amino acid), potassium phosphate, magnesium citrate, potato flour, and malachite green. Malachite green is used as an inhibitory substance for most bacteria (other than Mycobacterium), which are usually founding clinical specimens.

This medium can therefore be classified as a selective medium.

ENTEROTUBE II

The Enterotube II is a prepared, sterile multimedia tube for rapid differential identification of gram-negative bacteria. These are often used to detect and determine bacteria found in urine specimens. The Enterotube incorporates conventional media (including selective and differential types) into a single, ready to use tube that permits simultaneous inoculation and performance of eleven standard biochemical tests. After incubation, the color changes; changes resulting from biochemical activity, permit rapid identification of the species in question.

The test found in the Enterotube include glucose, gas production, lysine, ornithine, hydrogen sulfide, indole production, lactose, arabinose, urea, simmons citrate and sorbitol.

CHLAMYDOSPORE AGAR

Chlamydospore agar is recommended for use in differentiating Candida albicans form other Candida species on the basis of chlamydospore formation. (Note: you observed a kodachrome of Candida chlamydospores in the mycology portion of the You and Disease I lab.)

Candida albicans is the frequent pathogen in vaginal yeast infections and/or thrush in infants.

This medium can be classified as a selective and differential medium since the growth of other fungi are inhibited and different types of Candida can be differentiated.

The contents of this medium include ammonium sulfate, monopotassium phosphate, biotin, trypan blue, purified polysaccharide and bacto-agar.