

## **Practical microbiology**

### **CULTURE MEDIA**

Bacteria have to be grown (cultured) for them to be identified. By appropriate procedures they have to be grown separately (isolated) on culture media and obtained as pure for study.

**CULTURE MEDIA / A substance containing nutrients in which microorganisms or are cultivated for scientific purposes.**

**A culture medium / is any material prepared for the growth of bacteria or fungi in a laboratory.**

**Colony** macroscopically visible collection of millions of bacteria originating from a single bacterial cell .

Agar-agar / Used for preparing solid medium. Obtained from seaweeds. No nutritive value. Not affected by the growth of the bacteria , Melts at 98C° & sets at 42C° 2% agar is employed in solid medium

Bacterial culture media can be classified in at least three ways; Based on consistency and nutritional component, based on its functional use .

**Types of culture media :**

1-Types of culture media Based on their consistency a) solid medium b) liquid medium c) semi solid medium

2- Based on the constituents / ingredients (a) simple medium (b) complex medium (c) synthetic or defined medium (d) Special media

3- Based on nutritional component Special media **Enriched media** Enrichment media Selective media

4- Based on its functional use / Indicator media , Differential media , Sugar media , Transport media

5- Based on Oxygen requirement - Aerobic media - Anaerobic media

**Solid media** – contains 2% agar Colony morphology, pigmentation, hemolysis can be appreciated. Eg: Nutrient agar, Blood agar

**Liquid media** – no agar. For inoculum preparation, Blood culture, for the isolation of pathogens from a mixture. Eg: Nutrient broth

**Semi solid medium** – 0.5% agar. Eg: Motility medium.

**Simple media** basal media – Eg : NB, NA - NB consists of peptone , yeast extract, NaCl, - NB + 2% agar = Nutrient agar

**Complex media** Media other than basal media. They have added ingredients. Provide special nutrients Synthetic or defined media (Media prepared from pure chemical substances and its exact composition is known Eg: peptone water – 1% peptone + 0.5% NaCl in water)

- Prepared media by boiling animal or plant material to extract nutritive molecules

**Enriched media** Substances like blood , serum , egg are added to the basal medium. Used to grow bacteria that are exacting in their nutritional needs . Eg: Blood agar , Chocolate agar

**Enrichment media** Liquid media used to isolate pathogens from a mixed culture. Media is incorporated with inhibitory substances to suppress the unwanted organism. Eg: Selenite F Broth – for the isolation of Salmonella, Shigella Alkaline Peptone Water – for Vibrio cholera

**Selective media** The inhibitory substance is added to a solid media. Eg: MacConkey's medium for gram negative bacteria TCBS – for V.cholerae – Wilson and Blair medium – S.typhi Potassium tellurite medium – Diphtheria bacilli

**Indicator media** These media contain an indicator which changes its color when a bacterium grows in them. Eg : Blood agar , MacConkey's medium , urease medium

**Differential media** A media which has substances incorporated in it enabling it to distinguish between bacteria , Eg: MacConkey's medium , Peptone Lactose Agar Neutral red Taurocholate Distinguish between lactose fermenters & non lactose fermenters.

- Lactose fermenters – Pink colonies
- Non lactose fermenters – colourless colonies

**Sugar media** / containing any fermentable substance. Eg: glucose, arabinose, lactose, starch etc. Media consists of 1% of the sugar in peptone water. Contain a small tube (Durham's tube) for the detection of gas by the bacteria.

**Transport media** Media used for transporting the samples. Delicate organisms may not survive the time taken for transporting the specimen without a transport media. Eg: Stuart's medium – non nutrient soft agar gel containing a reducing agent Buffered glycerol saline – enteric bacilli

**Anaerobic media** These media are used to grow anaerobic organisms. Eg: Robertson's cooked meat medium, Thioglycolate medium .

