

## What is Culture Media?

Culture media is a gel or liquid that contains nutrients and is used to grow bacteria or microorganisms. They are also termed growth media. Different cell types are grown in various types of medium. Nutrient broths and agar plates are the most typical growth media for microorganisms. Some microorganisms or bacteria need special media for their growth.

**Significance** – Culture media is used in order to identify the causative agent from infected material.

### Types of Culture Media

The culture media are classified in many different ways:

1. Based on the physical state
  - Liquid media
  - Solid media
  - Semisolid media
2. Based on the presence or absence of oxygen
  - Anaerobic media
  - Aerobic media
3. Based on nutritional factors
  - Simple media
  - Synthetic media
  - Complex media
  - Special media

**Nutrient broths** or **lysogeny broth (LB)** medium are the two most popular growth media for bacteria. **Agar** is frequently added to liquid media before being placed into a petri dish to solidify. These agar plates offer a stable medium for the cultivation of bacteria. It stays solid because relatively few bacteria can break down agar.

### Simple Media

## Lab 4

## تقنيات البصريات

Simple culture media includes nutrient broth. 1% meat extract and peptone water makes up such broth. Nutrient broth becomes glucose broth when glucose is added to it. Likewise, it becomes nutrient agar when 2-3% agar is added. Examples – peptone water, nutrient agar and glucose broth.

### Complex Media

Other than simple media, all forms of media are termed complex media. Complex media contain additional components for bringing out specific qualities or providing the unique nutrients needed for the bacterium's growth. Examples – MacConkey agar medium and chocolate agar.

### Synthetic Media

A defined medium (chemically defined medium) is a medium in which there is no yeast, plant or animal tissue present, and all the chemicals employed are known. These are made from only pure ingredients whose exact composition is known.

### Special Media

Special media are of seven different types:

- **Enriched media** – It is created when a basic medium is supplemented with nutrients like eggs, blood or serum. For example, a blood agar medium is used for the growth of bacteria like *Streptococcus* which specifically requires blood for its proliferation.
- **Selective media** – Selective media contain components that prevent the growth of all but a small number of bacterial species and make it easier to isolate a specific species. When mixed bacterial flora is anticipated in specimens, these media are utilised to isolate specific bacteria from those specimens. For example, bile salt acts as a selective agent in BSA or bile salt agar. While preventing the growth of other intestinal organisms, it favours the growth of *Vibrio cholerae*.
- **Differential media** – It is a term used to describe a medium that has components that aid in identifying the various properties of bacteria. Peptone, agar, lactose, neutral red and sodium taurocholate are all ingredients in

MacConkey's medium. Here, the colonies made by lactose fermenters are pink, but those made by non-lactose fermenters are pale or colourless.

- **Enrichment media** – This media contains several ingredients that either stimulate the bacteria being grown or suppress their competitors. Examples – Alkaline peptone water and tetrathionate broth.
- **Transport media** – These are employed when dealing with delicate organisms that might not make it through the transit period or might become covered with non-pathogenic germs. Example – Stuart's transport medium.
- **Indicator media** – When bacteria multiply in these media containing an indicator, they tend to change their colour. MacConkey's medium is also an example of an indicator medium. Another classic example is the black colonies of *Salmonella typhi* that develop on sulphite-containing Wilson and Blair media.
- **Sugar media** – It contains 1% sugar, which can be any fermentable substance like glucose, mannitol, sucrose and lactose. The generation of acid following the fermentation of sugar transforms the medium into pink due to the presence of an indicator. Also to show that gas is produced, Durham's tube is kept inverted inside the sugar tube and gas bubbles are observed.