**Common ingredients of culture media:**

* Water: essential for bacterial growth, use deionized or distilled water.
* Peptone: from hydrolised animal or plant protein, it provides nitrogen and amino acid.
* Meat extract: provides amino acid, vitamins, mineral salts (phosphate and sulphate).
* Yeast extract: used to stimulate the growth of bacteria.
* Mineral salts: traces of magnesium, potassium, iron and calcium which are essential for bacterial enzyme activity.
* Carbohydrates: to provide bacteria with energy and carbon source.
* Agar: inert polysaccharide from sea weed or marine algae, it is solidifying agent with concentration of 1-2%, dissolves at 90-100 °C, solidify at 45 °C.

**Forms of media:**

* Liquid form (broth): without agar (no solidifying agent), used to grow bacteria in large quantity, the growth appear as turbidity and if no growth it appear clear.
* Solid form: by adding agar, it can be **slant** or **deep agar** which is used to keep bacteria for long time (up to 3 months), **agar plate** can be used to have isolated colonies that help identification.

**Pure culture:** culture containing only one type of bacteria to study them. It is impossible to study the bacteria when other organisms are present.

**Preparation of media:**

All constituents of media should be weighed and mixed as indicated in instruction on the bottle.

Example: calculate how many grams needed for 100ml media?

20g in 1000ml (stated in instruction)

So, for 100ml

100\*20/1000= 2 g

* When we want to add material sensitive to heat, we add them after sterilization. Example is the blood that should be added to the cooled media after sterilization.

***Pure culture technique***

The act of organism culturing into the media is called inoculation or streaking.

* The common method to obtain pure culture (isolated colony) is dry dilution that should be done under septic conditions to prevent growth of contaminants.

**Types of media and their functions**

1. **Basal media:** allows growth of most non pathogenic bacteria.E.g.nutrient agar.
2. **Enriched media:** when the basal agarhas been enriched through adding blood or serum. To allow the growth of pathogenic bacteria. E.g. blood agar.
3. **Selective media:** has certain inhibiting agent to inhibit the growth of some bacteria and allow growth of others.

Example: macconkey agar (Mac): contains bile salt and crystal violet as inhibiting agent. It allows growth of gram negative bacteria and inhibits growth of gram positive ones.

1. Differential media: contains indicator that can differentiate between two types of bacteria.

Examples

* Macconkey(Mac): to differentiate between lactose fermenting bacteria (LF) and non lactose fermenting ones(NLF). The media contains sugar (lactose) and indicator (neutral red).

LF bacteria (such as E.coli) ferment lactose and produce acid + indicator………pink color.

NLF bacteria (such as proteus) are not able to ferment lactose +indicator…………colorless.

* EMB: differentiate between LF and NLF. It has sugar (lactose) and indicator (eosin+methylen blue). E.coli on EMB gives green metallic sheen.
* Mac and EMB are selective and differential media.
* CLED (cystine lactose electrolyte deficient): differentiate between LF and NLF. It has sugar (lactose) and indicator (bromo thymol blue). LF appears yellow and NLF appears colorless.
* CLED is only differential but not selective.