



Media

# Common contents of culture media:

- **Water**: essential for bacterial growth. Deionized or distilled water is used.
- **Peptone**: it is hydrolyzed protein of animal or plant  
It provide the bacteria with **nitrogen** and **amino acid**.
- **Meat extracts**: it provide the bacteria with **amino acid**, **vitamins**, **mineral salts** ( phosphate and sulphate).
- **Yeast extract**: used to stimulate the growth of bacteria.

- **Mineral salts:** media should contain little amount of:  
Mg, k, Fe, Ca

Which is essential for stimulate bacterial enzyme activity.

- **Carbohydrates:** to provide the bacteria with energy and carbon.
- **Agar:** its inert polysaccharide extracted from sea-weed or marine algae.
  - It's a solidifying agent.
  - Dissolves at 90-100 C
  - Solidify at 45 C

# Forms of media:

## 1- Liquid form:

- Called: broth.
- Without agar (solidifying agent).
- Used to grow bacteria in large quantity.

- Growth of bacteria-----> **turbidity**
- No growth -----> **clear**



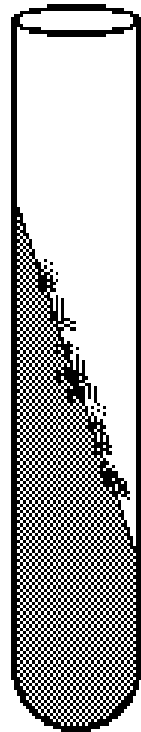
## 2- Solid form:

With agar.

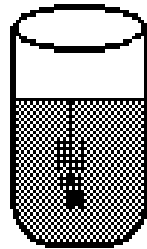
-Its can be:

- a) **Slant**: used to keep the bacteria for long period of time (3 months)
- b) **Deep agar**: keep the organism for long time.
- c) **Agar plate**: to get pure culture of bacteria (isolated colony).

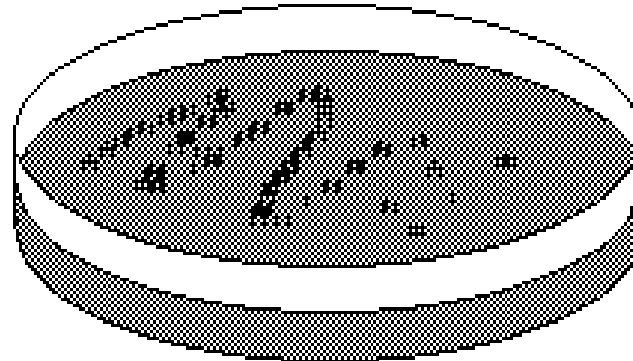
**Various Examples of Solid Media  
(black = culture)**



**Slant**

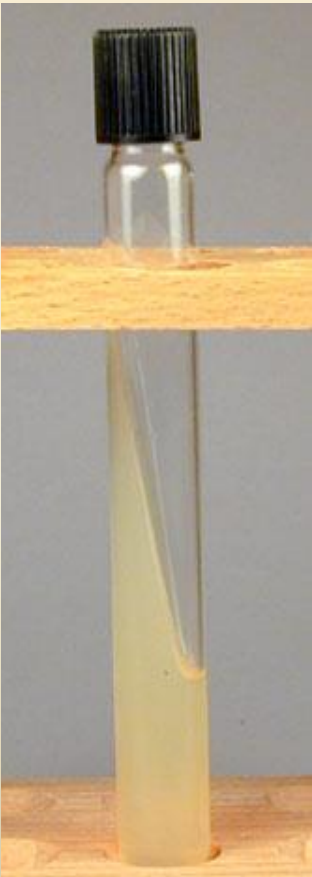


**Stab or Deep**



**Streaked Petri Dish**

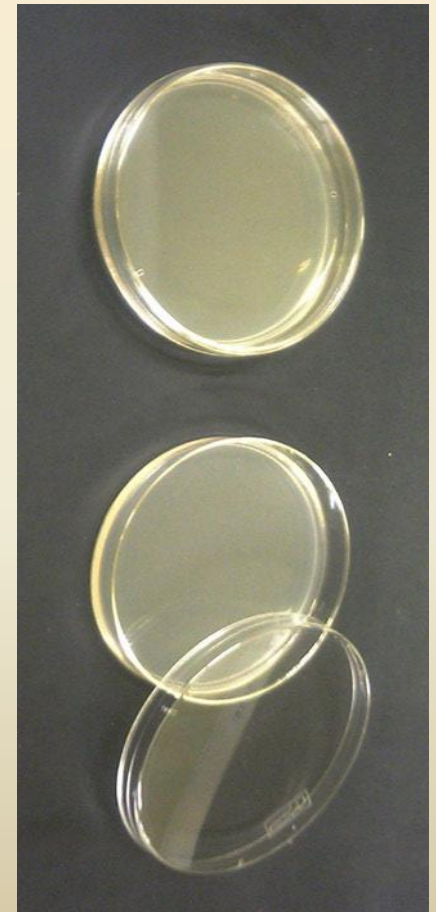
- Slant Agar



- Deep Agar



- Plate Agar



## Preparation of media

### Pure culture:

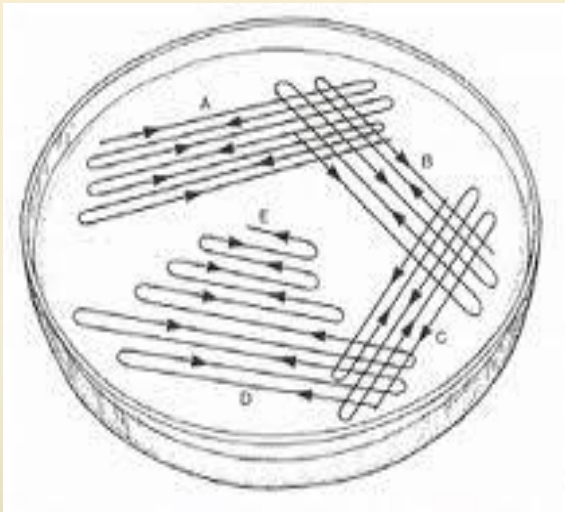
It is Culture containing only one type of bacteria.

-Putting of organism into the media called:

Inoculation or streaking



# Quadrant streak method



# Types of media:

## 1- Basal media:

It allow the growth of most non-pathogenic bacteria.

Ex: *Nutrient agar (NA)*.

## 2- Enriched media:

It is basal media has been enriched by adding blood, serum or protein.

It allow the growth of pathogenic bacteria.

Ex: *Blood agar (BA)*.

Nutrient agar (NA)



Blood agar (BA)



### 3- Selective media:

Some inhibiting agent added, to inhibit the growth of some bacteria and allow the growth of others.

Examples:

- a) Macconkey agar (Mac)
- b) Eosin methylene blue (EMB)

**Mac:** inhibiting agent is **bile salt** and **crystal violet**.

**A&B**

It allow the growth of gram -ve bacteria and inhibit the growth of gram +ve bacteria.

Macconkey agar (Mac)



Eosin methylene blue (EMB)



#### 4- Differential media:

It contain **indicator** which differentiate between two types of bacteria.

Examples:

a) Mac:

Use it to differentiate between lactose fermenting (LF) bacteria and non-lactose fermenting (NLF) bacteria.

**The media contain:**

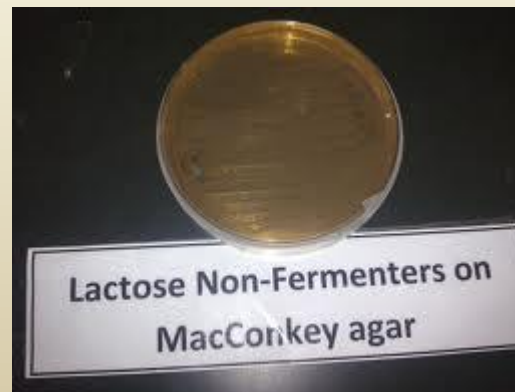
- Sugar (lactose)
- Indicator (neutral red)

indicator

LF ----> ferment lactose ----> acid-----> pink color



NLF----> not ferment lactose ----> no acid-----> colorless



## b) EMB:

Use it to differentiate between lactose fermenting (LF) bacteria and non-lactose fermenting (NLF) bacteria.

**The media contain:**

-Sugar (lactose)

-Indicator (eosin + methylen blue)

**indicator**

LF ----> ferment lactose ----> acid -----> **Dark purple  
pink color**

NLF----> not ferment lactose ----> no acid----> colorless



- E.coli (gram -ve , lactose fermenter) on EMB it gives :  
**Green metallic sheen.**



- Mac and EMB are selective and differential media.

### c) CLED (cystine lactose electrolyte deficient):

Use it to differentiate between lactose fermenting (LF) bacteria and non-lactose fermenting (NLF) bacteria.

#### **The media contain:**

- Sugar (lactose)
- Indicator (bromo thymol blue)



indicator

LF ----> ferment lactose ----> acid-----> **yellow color**



NLF----> not ferment lactose ----> no acid----> colorless

- CLED is only differential media