**culture media**

is a liquid or gel designed to support the growth of [microorganisms](https://en.wikipedia.org/wiki/Microorganism) or [cells](https://en.wikipedia.org/wiki/Cell_%28biology%29). There are different types of media for growing different types of cells.

An important distinction between growth media types is that of *defined* versus *undefined* media. A defined medium will have known quantities of all ingredients. For microorganisms, they consist of providing trace elements and vitamins required by the microbe and especially a defined [carbon source](https://en.wikipedia.org/wiki/Carbon) and [nitrogen source](https://en.wikipedia.org/wiki/Nitrogen). [Glucose](https://en.wikipedia.org/wiki/Glucose) or [glycerol](https://en.wikipedia.org/wiki/Glycerol) are often used as carbon sources, and [ammonium](https://en.wikipedia.org/wiki/Ammonium)[salts](https://en.wikipedia.org/wiki/Salt) or [nitrates](https://en.wikipedia.org/wiki/Nitrate) as [inorganic](https://en.wikipedia.org/wiki/Inorganic) nitrogen sources. An undefined medium has some complex ingredients, such as [yeast extract](https://en.wikipedia.org/wiki/Yeast_extract) or casein hydrolysate, which consist of a mixture of many, many chemical species in unknown proportions. Undefined media are sometimes chosen based on price and sometimes by necessity – some microorganisms have never been cultured on defined media.

**Types of culture media**

Media are of different types on consistency and chemical composition.

**A. On Consistency:**
1.   Solid Media. Advantages of solid media:

 (a) Bacteria may be identified by studying the colony character

 (b) Mixed bacteria can be separated.

Solid media is used for the isolation of bacteria as pure culture. 'Agar' is most commonly used to prepare solid media. Agar is polysaccharide extract obtained from seaweed. Agar is an ideal solidifying agent as it is :

(a) Bacteriologically inert, i.e. no influence on bacterial growth

 (b) It remains solid at 37°C

 (c) It is transparent.
2.     Liquid Media. It is used for profuse growth, e.g. blood culture in liquid media. Mixed organisms cannot be separated.

**B. On Chemical Composition :**
1.   Routine Laboratory Media
2.   Synthetic Media. These are chemically defined media prepared from pure chemical substances. It is used in research work.
**RoutineLaboratoryMedia**
These are classified into six types:

(1) Basal media, (2) Enriched media, (3) Selective media, (4) Indicator media, (5) Transport media, and (6) Storage media.
**1.   BasalMedia.** Basal media are those that may be used for growth (culture) of bacteria that do not need enrichment of the media. Examples: Nutrient broth, nutrient agar and peptone water. Staphylococcus and Enterobacteriaceae grow in these media.

**2.     Enriched**Media**.** The media are enriched usually by adding blood, serum or egg. Examples: Enriched media are blood agar and Lowenstein-Jensen media. Streptococci grow in blood agar media.

**3.   SelectiveMedia.** These media favors the growth of a particular bacterium by inhibiting the growth of undesired bacteria and allowing growth of desirable bacteria. Examples: MacConkey agar, Lowenstein-Jensen media, tellurite media (Tellurite inhibits the growth of most of the throat organisms except diphtheria bacilli). Antibiotic may be added to a medium for inhibition.

**4.     Indicator (Differential) Media**An indicator is included in the medium. A particular organism causes change in the indicator, e.g. blood, neutral red, tellurite. Examples: Blood agar and MacConkey agar are indicator media.
**5.   TransportMedia.** These media are used when specie-men cannot be cultured soon after collection. Examples: Cary-Blair medium, Amies medium, Stuart medium.
**6.   Storage Media.** Media used for storing the bacteria for a long period of time. Examples: Egg saline medium, chalk cooked meat broth.

**COMMON MEDIA IN ROUTINE USE**

**1-Nutrient Broth.** Uses: (a) As a basal media for the preparation of other media

(b) To study soluble products of bacteria.

**2-Nutrient Agar.** It is solid at 37°C. 2.5% agar is added in nutrient broth. It is heated at 100°C to melt the agar and then cooled.
**3-Peptone Water.** Peptone 1% and sodium chloride 0.5%. It is used as base for sugar media and to test indole formation.
**4-Blood Agar.**
**5-Chocolate Agar or Heated Blood agar.**

6-**MacConkey Agar.** Most commonly used for enterobac­teriaceae. It is a selective and indicator medium :
**(a)   Selective** as bile salt does not inhibit the growth of enterobactericeae but inhibits growth of many other bacteria.
**(b)   Indicator**medium as the colonies of bacteria that ferment lactose take a pink color due to production of acid. Acid turns the indicator neutral red to pink. These bacteria are called 'lactose fermenter', e.g. Escherichia coll. Colorless colony indicates that lactose is not fermented, i.e. the bacterium is non-lactose fermenter, e.g. Salmonella. Shigella, Vibrio.

7-**Lowenstein-Jensen Medium.** It is used to culture tubercle bacilli. It contains egg, malachite green and glycerol.