



## Culture media

Microorganisms require accessible nutrients and a conducive growth environment to survive and proliferate. The nutrient preparations used in the lab to cultivate microorganisms are referred to as media (plural: medium). In other word the food we use to cultivate molds, bacteria, and other microorganisms is known as **media**.

### Types of Media

Media fall into three general categories based on their properties: physical state, chemical composition, and functional type.

#### A. Physical form of Media

Three physical forms are used: **liquid**, or **broth media**; **semisolid media**; and **solid media**. The major difference among these media is that solid and semisolid media contain a solidifying agent (usually **agar**), A liquid medium, however, does not.

- **Broth is a liquid medium** that does not solidify when the temperature rises above freezing. As growth spreads throughout the container, it may appear distinct and hazy. Large numbers of organisms are propagated using these media. For example, **Nutrient broth**.
- **Solid media**, such as **blood agar** and **nutrient agar**, are helpful for isolating and cultivating bacteria because they offer a firm surface on which cells can form distinct colonies.
- Semisolid media fall in between liquid and solid media., like Manitol Motility media, are used to measure the motility of bacteria, despite having solidifying agents like agar or gelatin, which makes them similar to solid media.

**Agar**, is a jelly-like substance consisting of polysaccharides obtained from the cell walls of some species of red algae, primarily from "ogonori" (*Gracilaria*)

## Chemical media

**Synthetic media** are defined by a precise formula and have a chemical composition. Pure chemical nutrients are present in such media. **complex or non-synthetic medium**. There is no precise chemical formula for this kind of medium's composition. Extracts from plant or animal tissues, blood, serum, and meat extracts, such as nutrient broth, blood agar, and MacConkey agar, are examples of substances that can render it non-synthetic. For microorganisms with intricate nutritional requirements, they offer a diverse range of nutrients.

## Functional type of media

□ **General-purpose media** are designed to grow a broad spectrum of microbes that do not have special growth requirements. Examples include nutrient agar and broth, brain-heart infusion, and trypticase soy agar (TSA).

□ **Enriched medium**: Blood, serum, hemoglobin, or unique growth factors like blood agar are examples of complex organic materials found in enriched media. Fastidious bacteria are those that need growth factors and complex nutrients.

□ **A selective medium** is made up of one or more substances that prevent the growth of some microorganisms but not others. Selective media are crucial for the primary isolation of a particular type of microorganism from samples that contain mixtures of different species, such as soil, water, feces, saliva, and skin. such as the mannitol salt agar used to isolate *Staphylococcus* bacteria.

□ **Differential media**, such as chromogenic agar and MacConkey agar, are media that contain substances that cause certain bacteria to appear (color, colony) differently from other species. This allows one to distinguish one species from another.

□ **Transport media** are used to keep and preserve specimens that have to be stay for a period of time before clinical analysis or to keep weak species that die rapidly such as **pepton water**.

□ **Assay media**: technologists use assay media, like **Muller-Hinton agar**, to test the efficacy of antibiotics.

