

CULTURE MEDIA

The various types of media used for tissue culture may be grouped into 2 broad categories:

1. Natural Media
2. Artificial Media

The choice of media depends mainly on the type of cells to be cultured (normal, immortalized or transformed) and the objective of culture (growth, survival, differentiation and production of desired proteins). Non-transformed or normal cells and primary culture from healthy tissues require defined quantities of proteins, growth factors and hormones. But immortalized cells produce most of the growth factors present in the serum. In contrast transformed cells synthesize their own growth factors, but even these cultures may require factors like insulin, transferrin, lipids etc.

1) NATURAL MEDIA

Natural media are the natural sources of nutrient sufficient for growth and proliferation of animal cells and tissue. These media consists surely of naturally occurring biological fluids and are of the following 3 types

- a) Clots
- b) Biological Fluids
- c) Tissue Extract

a) CLOTS – The most commonly used clots is plasma clots. Plasma is commercially available either in liquid or lyophilized state. It may also be prepared in the laboratory, usually from the blood of male fowl, but blood clotting must be avoided during the preparation. An anticoagulant such as heparin is used.

b) BIOLOGICAL FLUIDS – Of the fluids used as culture medium, serum is the most widely used. Serum may be obtained from adult human blood, placental cord blood, horse blood or calf blood.

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b) BIOLOGICAL FLUIDS – Of the fluids used as culture medium, serum is the most widely used. Serum may be obtained from adult human blood, placental cord blood, horse blood or calf blood.

Serum is the liquid exuded from coagulating blood. Different preparations of serum differ in their properties; they have to be tested for sterility and toxicity before use.

e) **TISSUE EXTRACTS** – Chick embryo extract is the most commonly used tissue extract, but bovine embryo extract is also used. Other tissue extracts that have been used are spleen, liver, bone marrow, leucocytes etc. extracts. They are also often substituted by a mixture of amino acids and certain other organic compounds.

2) ARTIFICIAL OR SYNTHETIC MEDIA

Synthetic media are prepared artificially by adding several organic and inorganic nutrients, vitamins, salts, O₂, CO₂ gas phases, serum proteins, carbohydrates, cofactors etc. Different types of synthetic media can be prepared for a variety of cells and tissues to be cultured and for different functions.

The various types of artificial media are classified into:

- 1) Serum containing Media
- 2) Serum free media
- 3) Chemically defined media
- 4) Protein free media

1) **Serum containing Media** - The serum provides various plasma proteins, peptides, lipids, carbohydrates, minerals and some enzymes. Serum serves the following major functions-

- a) It provides the basic nutrients for cells.
- b) It provides several hormones e.g. insulin which is essential for growth of nearly all cells in culture.