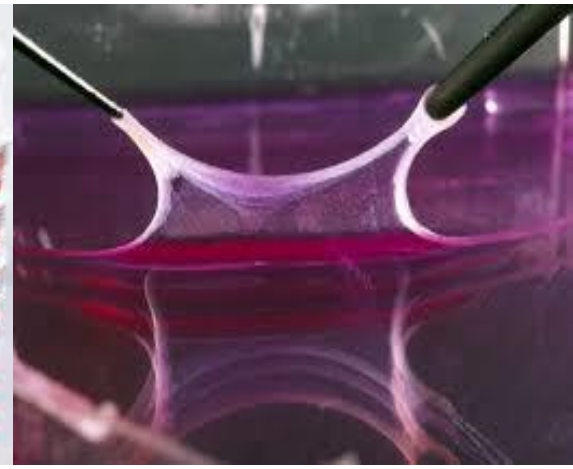
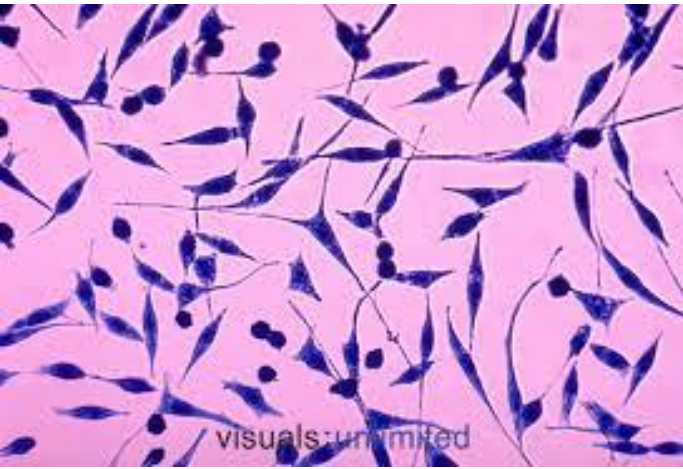


Cell & Tissue Culture



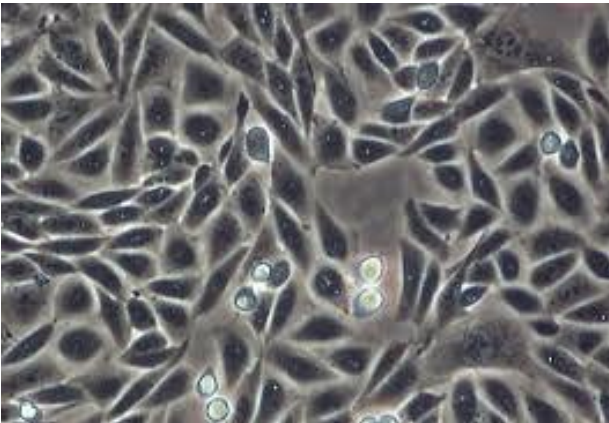
- Live cells and tissues can be maintained and studied outside the body.
- In a complex organism, tissues and organs are formed by several kinds of cells. These cells are bathed in fluid derived from blood plasma, which contains many different molecules required for growth.

Media Formulations

- RPMI 1640
- Antibiotics
- FBS
- L-glutamine
- Filtering Flasks



Culturing

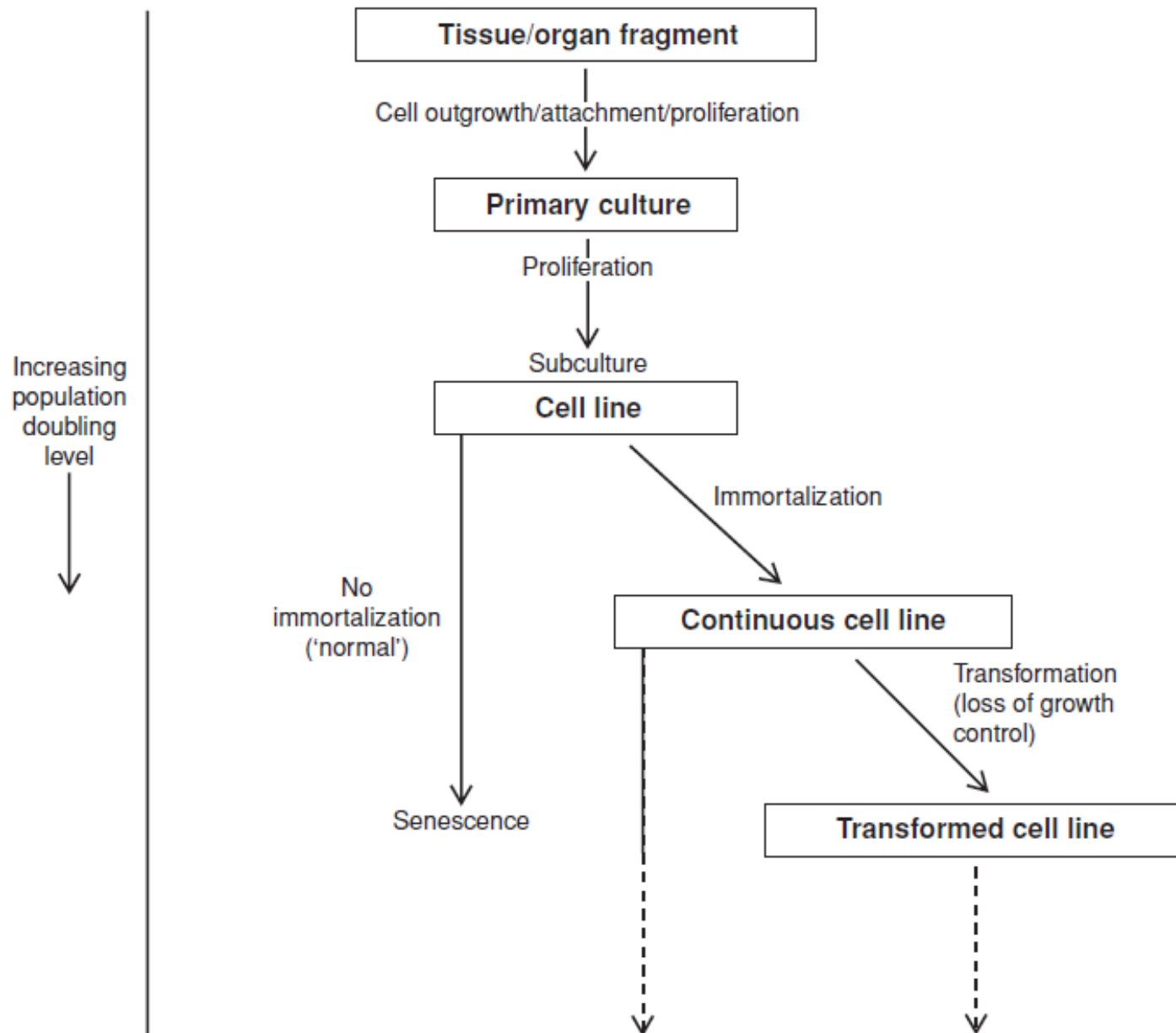


- Cell culture has been very helpful in isolating the effects of single molecules on specific types of cells.
- It also allows the direct observation of the behavior of living cells under a phase contrast microscope.
- Many experiments that cannot be performed in the living animal can be accomplished in vitro.

- The cells and tissues are grown in complex solutions of known composition (salts, amino acids, vitamins) to which serum components or specific growth factors are added.
- In preparing cultures from a tissue or organ, cells must be initially dispersed mechanically or enzymatically.

- **Once isolated, the cells can be cultivated in a clear dish to which they **adhere, usually as a single layer of cells or as suspended cells****
- **Cultures of cells that are isolated in this way are called **primary cell cultures**.**

- Many cell types once isolated from normal or pathologic tissue have been maintained *in vitro* ever since because they have been **immortalized** and now constitute a permanent cell line.
- Most cells obtained from normal tissues have a **finite, genetically programmed life span.**



MEDICAL APPLICATION

- **Cell culture has been widely used for the study of the metabolism of normal and cancerous cells and for the development of new drugs.**
- **This technique is also useful in the study of parasites that grow only within cells, such as viruses, mycoplasma, and some protozoa.**

- **In cytogenetic research, determination of human karyotypes (the number and morphology of an individual's chromosomes)**
- **molecular biology and recombinant DNA technology.**

Other Tissue Culture Applications

- 1. Production of antiviral vaccines**
- 2. Understanding of neoplasia (cancer research)**
- 3. Transfer of DNA to the cultured cells (or siRNA)**
- 4. Monoclonal antibody production (immunology)**
- 5. Production of human growth hormone, insulin, interferon**
- 6. Stem cell culture differentiate into neurons**
- 7. Implanting normal fetal neurons into patients with Parkinson diseases**
- 8. In vitro fertilization (embryo culture)**

