



محاضرة رقم: 7

¹ Lecture No 7:

Practical

Advanced laboratory technique

TISSUE CULTURE - CELL LINE

Sawa University

College of health and medical techniques

Department of Medical Laboratories

. Stage third

جامعة ساوة الاهلية

كلية التقنيات الصحية والطبية

قسم تقنيات المختبرات الطبية

المرحلة / الثالثة

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Tissue Culture

Tissue culture is a **biological technique** used to **grow cells or tissues** from **plants or animals** in an artificial medium **outside** their natural environment . It is widely **applied in research , medicine , and genetic engineering**



Steps of Tissue Culture:

1. **Sample Preparation:** Select a suitable sample from plant or animal tissue (e.g., **skin cells** or **plant fragments**). Sterilize the sample and tools to avoid contamination.
2. **Tissue Dissection and Dissociation:** Cut the sample into small pieces or dissociate it mechanically or enzymatically (e.g., using trypsin) to release cells.
3. **Preparation of the Culture Medium:** Prepare a nutrient-rich medium containing essential components (amino acids, vitamins, glucose) and antibiotics to prevent microbial growth.
4. **Inoculation of Cells into the Medium:** Place the cells or tissue fragments in Petri dishes or flasks containing the medium.



5. Incubation:

- Incubate the cultures in a controlled environment (e.g., 37°C for animal cells) or appropriate light for plant cells.

6. Monitoring Growth:

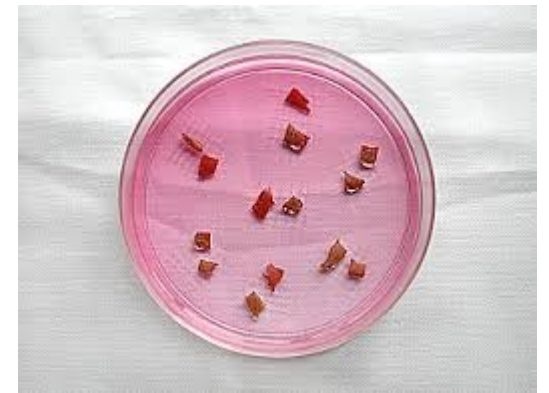
Regularly check the cultures under a microscope to monitor cell growth and ensure they remain free from contamination.

7. Sub-culturing (Passaging):

Transfer cells to a new medium when they reach high density to allow further growth.

8. Storage or Utilization:

Cells can be cryopreserved at -80°C or in liquid nitrogen for future use.





Cell Line – Definition

A **cell line** is a population of cells that has been **isolated from a living organism** and **adapted to grow continuously under laboratory conditions**. These cells can **divide and proliferate over many generations**, making them useful for **research, medical studies, and biotechnology applications**.

Types of Cell Lines



Cell lines refer to cell populations isolated and cultured over multiple generations in laboratories

:They are divided into several types

- **Primary Cell Lines:** Cells directly isolated from tissues and maintained for a short period.
- **Continuous (Immortal) Cell Lines:** Cells that can divide indefinitely under laboratory conditions.
- **Finite Cell Lines:** Cells with a limited number of divisions before senescence.
- **Stem Cell Lines:** Undifferentiated cells capable of differentiating into specialized cell types.
- **Genetically Engineered Cell Lines:** Cells modified to express specific genes or proteins

Applications of Tissue Culture in Medical Research

- **Drug Development:** Testing the efficacy and toxicity of new drugs.
- **Vaccine Production:** Culturing viruses in specific cells to develop vaccines.
- **Stem Cell Therapy:** Growing stem cells for regenerative treatments.
- **Cancer Research:** Studying behavior of cancer cells and testing therapies.
- **Genetic Testing & Diagnosis:** Identifying genetic disorders through cultured biopsies or prenatal tests.

Any questions?

*Thank
You*

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- What are cell lines? Discuss their types and explain one application of cell lines in medical research.
 - Explain the main steps of tissue culture and describe the purpose of each step,