LAB :(1):PLANT TISSUE CULTURE

DEVICES USED IN PLANT TISSUE CULTURE

(THE FOURTH STAGE)

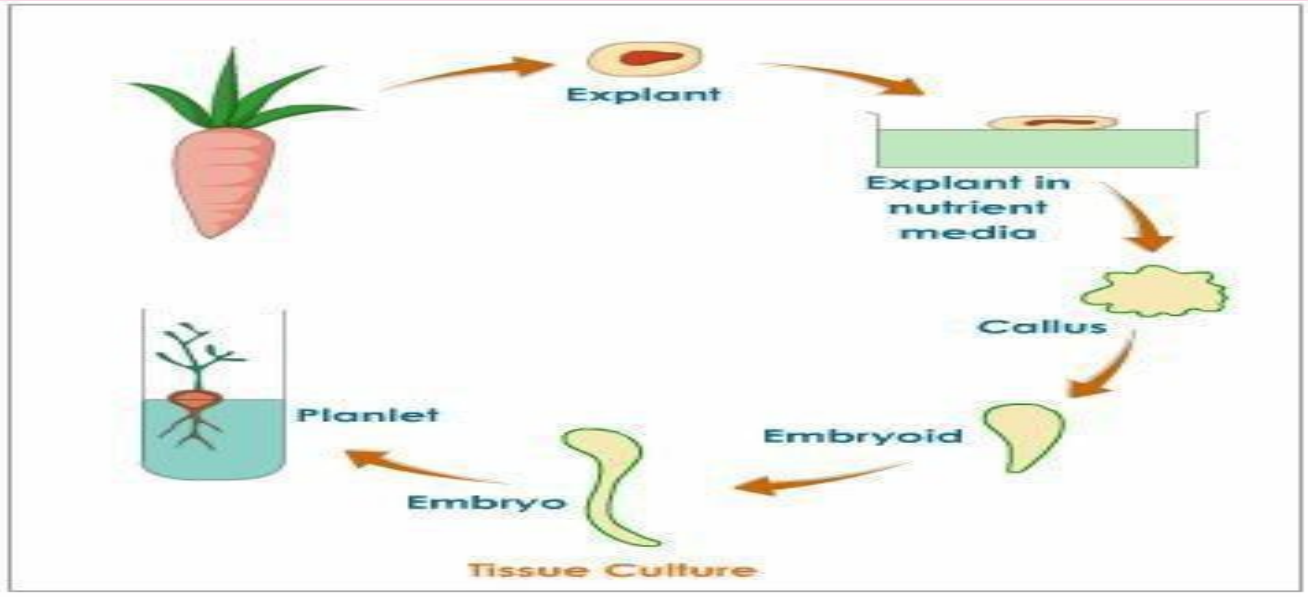
M.SC. DHUHA MOHSEN ABBAS

- UNIVERSITY OF MUSTANSIRIYAH
- COLLEGE OF SCIENCE
- DEPARTMENT OF BIOLOGY

TISSUE CULTURE

- M.Sc. Dhuha Mohsen Abbas

- 1- It is in this laboratory to teach students practical on how to plant tissue culture for plant propagation.
- 2- where preparation is the (Media) to be used for the cultivation of the node and the buds.
- 3- placed in the appropriate temperature and moisture and lighting conditions,
- 4- so that these circumstances allow for the growth of the node and the buds after growth is placed in the soil to prepare the seedlings



- Tissue Culture :is the term applied to the vegetative propagation of plants inside glass containers by excising a small part of various plant tissues (such as the growing tip, a portion of leaves, or cells) and growing it on a balanced nutrient medium under sterile and controlled environmental conditions, thereby differentiating into organs and forming complete plants.









- **DEVICES USED IN PLANT TISSUE CULTURE:-**

1- INCUBATOR\VERSATILE ENVIRONMENT TEST CHAMBER.

- 2- LAMINAR FLOW, HORIZONTAL,KBM4.
- 3- AUTOCLAVE TUTTNUER MODEL 2540.
- 4- FLUORESCENT MICROSCOPE, NIKON-501.
- 5- DISPENSER SYSTEM.
- 6- PH METER.

1- INCUBATOR\VERSATILE ENVIRONMENT TEST CHAMBER

- **Growth Chamber•**
- **1-Temperature Regulation: Maintains a constant, suitable temperature to stimulate cell division and tissue growth without thermal stress.•**
- **2-Lighting Control: Provides specific light intensity and duration to simulate natural cycles for plant growth and photosynthesis.•**
- **3-Humidity Regulation: Prevents the drying out of culture media and maintains balanced humidity to preserve the viability of the cultured tissues.•**
- **4- Contamination Prevention: Provides a sealed, clean environment that protects sensitive samples from fungal or bacterial contamination.**

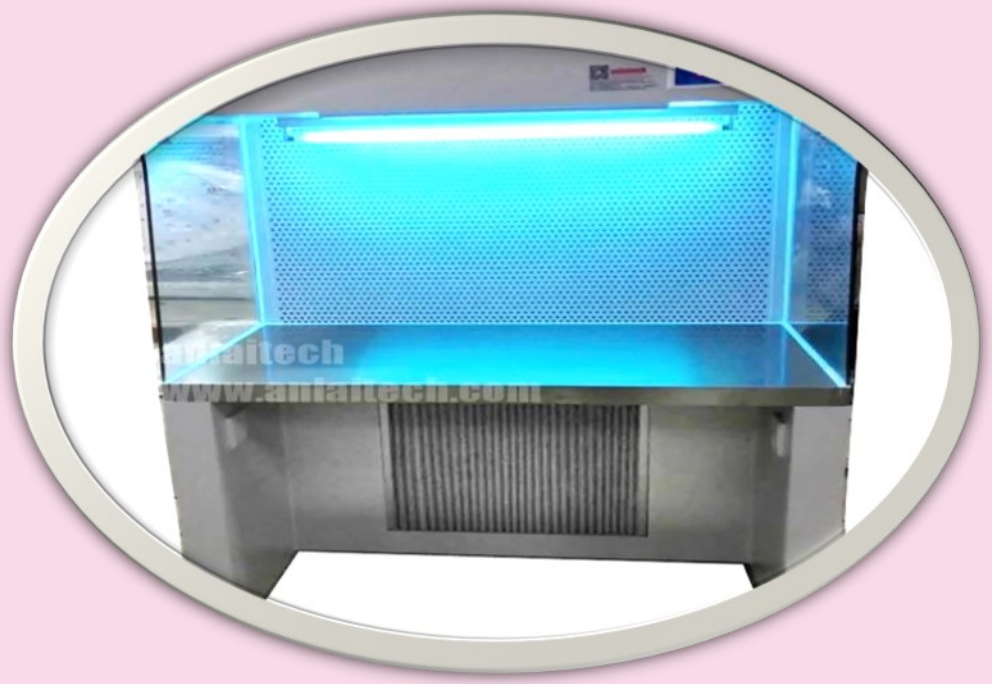




• 2- LAMINAR FLOW, HORIZONTAL,KBM4

- **In these units, air passes through high-efficiency (HEPA) filters and then flows continuously in a horizontal direction—from back to front—towards the researcher; this prevents contaminants and germs from entering the workspace and preserves the cultured tissues.**





3- AUTOCLAVE TUTTNUER MODEL 2540

- The Tuttnauer 2540 steam sterilizer is a 23-liter autoclave designed for small- to medium-sized plant tissue culture laboratories to ensure an environment completely free from fungal and bacterial contamination.
- **Key sterilization guidelines:**
- 1. Water type: Use only distilled water in the device's reservoir to protect the heating elements and chamber from mineral deposits.
- 2. Container sealing: Leave jar lids slightly loose during sterilization to allow for steam and pressure equalization, then tighten them inside the laminar flow hood.
- 3. Liquid cycles: Use the "Slow Exhaust" setting for culture media to prevent boiling over or foaming.





• 4- FLUORESCENT MICROSCOPE, NIKON-501

- A fluorescence microscope is an advanced type of optical microscope that utilizes the phenomenon of fluorescence to study the properties of organic and inorganic materials through absorption and emission.
- **Working Principle**
- • lumination: High-intensity light (such as ultraviolet or blue light) with a short wavelength is directed onto the sample using a mercury, xenon, or LED lamp.
- • Excitation: Fluorescent molecules or dyes within the sample absorb this light and become excited.
- • Emission: The sample re-emits light at a longer wavelength (fluorescence), while optical filters block the original excitation light, allowing only the fluorescent light to reach the lenses and camera to form a bright image against a dark background.
- **Key Components**
- • Light Source: Powerful lamps such as mercury, metal halide, or LED.
- • Light Filters: Include the excitation filter and the barrier (emission) filter to select specific wavelengths.
- • Dichroic Mirror: Reflects the excitation light toward the sample while allowing the emitted light to pass through.



• 5- DISPENSER SYSTEM

A DISPENSER SYSTEM IS A GENERAL TERM APPLIED TO ANY DEVICE THAT DISPENSES OR RELEASES SPECIFIC, CALIBRATED QUANTITIES OF A PARTICULAR SUBSTANCE (WHETHER LIQUID, GAS, OR SOLID) IN AN ORGANIZED AND SAFE MANNER. THESE SYSTEMS COME IN VARIOUS SHAPES AND SIZES DEPENDING ON THE FIELD IN WHICH THEY ARE USED.





