Practical Biotechnology

Lab 2
Tools and Techniques in Biotechnological Studies

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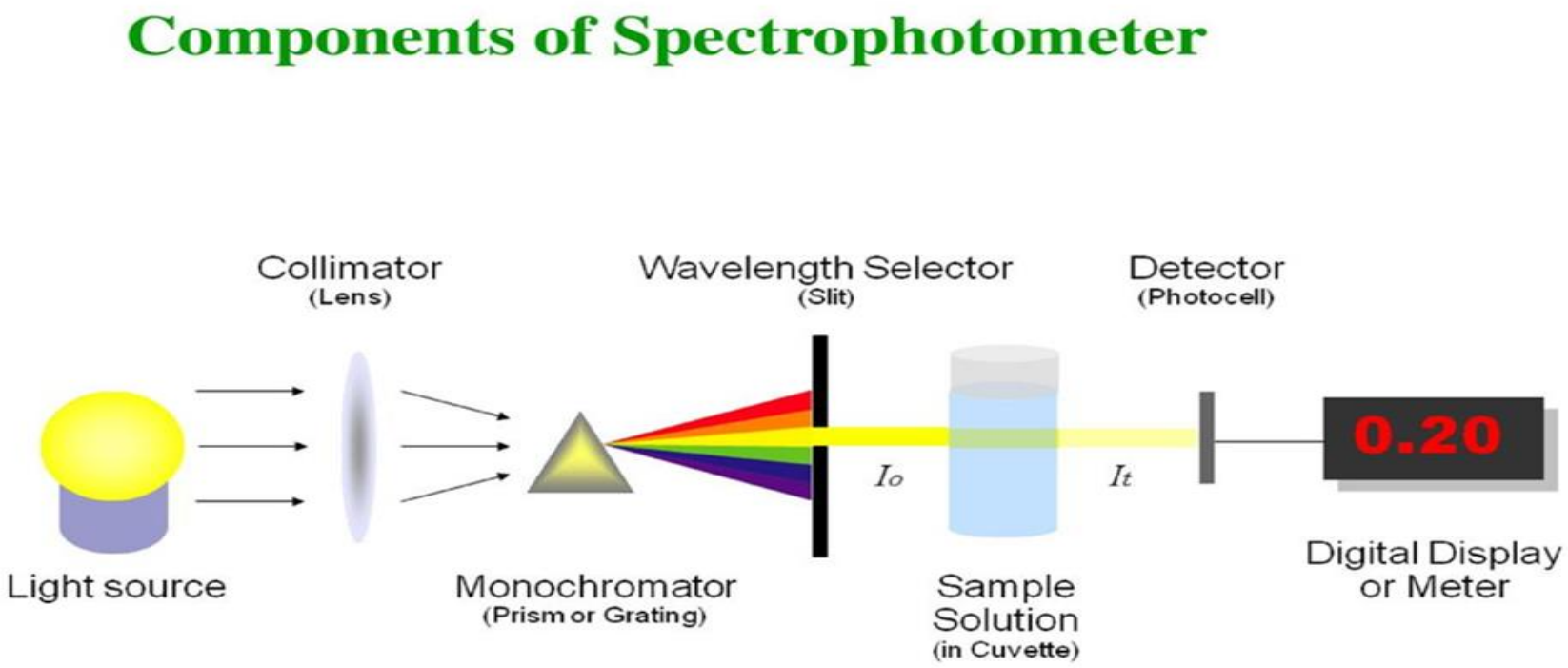
Spectrophotometer

use of the transmission of light through a solution to determine the concentration of a solute within the solution

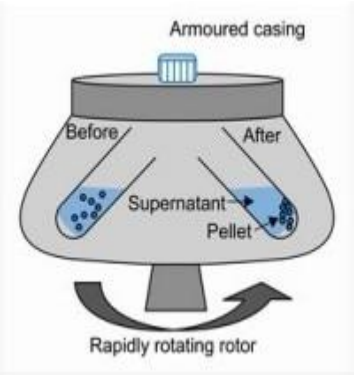
By measuring the relative amounts of light energy passed through a substance that is absorbed or transmitted.

A spectrophotometer use a prism to separate light into its component wavelengths.



Centrifuge

A centrifuge is a device that uses centrifugal force to separate various components of a fluid.
Separation is achieved by spinning a vessel containing material at high speed based on density. the centrifugal force pushes heavier materials to the outside of the vessel.



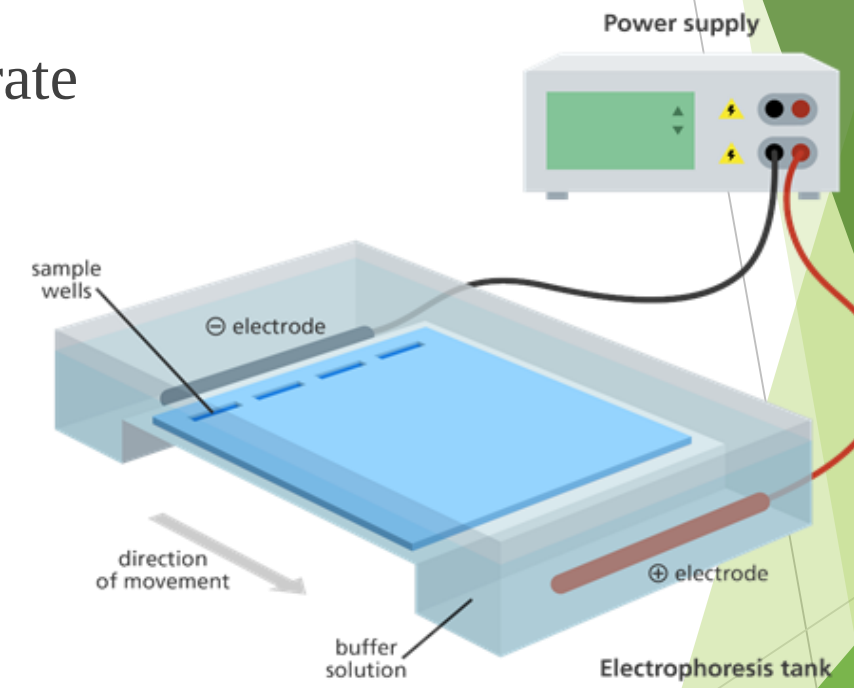
This apparatus is found in most laboratories from academic to clinical to research and used to purify cells, subcellular organelles, viruses, proteins, and nucleic acids.
There are multiple types of centrifuge, variety From the large floor to the micro-centrifuge.

Electrophoresis

Electrophoresis is the migration of charged molecules in response to an electric field. Their rate of migration depends on :

1. the strength of the field.
2. size and shape of the molecules.
3. the ionic strength.
4. viscosity, and temperature of the medium in which the molecules are moving.

Electrophoresis is simple, rapid, and highly sensitive.



PH Meter

A pH meter is a scientific instrument that measures the hydrogen-ion activity in water-based solutions, indicating its acidity or alkalinity expressed as pH. The difference in electrical potential relates to the acidity or pH of the solution. The pH meter is used in many applications ranging from laboratory experimentation to quality control.

In general there are three major categories of pH meters. Benchtop pH meters are often used in laboratories.

field pH meters, are handheld pH meters that are used to take the pH of a sample in a field or production site.

In-line or in situ pH meters, also called pH analyzers.

pH meters range from simple and inexpensive pen-like devices to complex and expensive laboratory instruments with computer interfaces.

Vitek

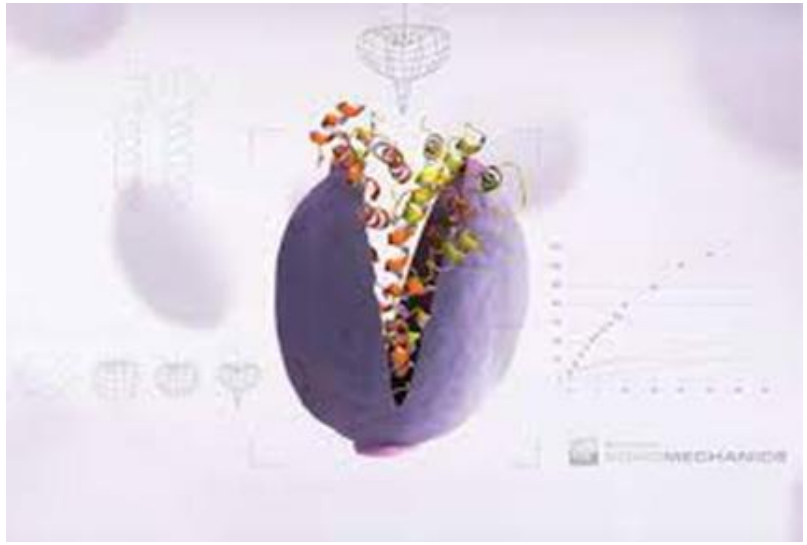
VITEK 2 is a fully automated system that performs healthcare , uses for Microbial Identification - bacteria and yeast identification (ID) And Antibiotic Susceptibility Testing (AST) and resistance mechanism detection Epidemiologic trending and reporting.

Ultrasonic cell disruption

Ultrasonic cell disruption

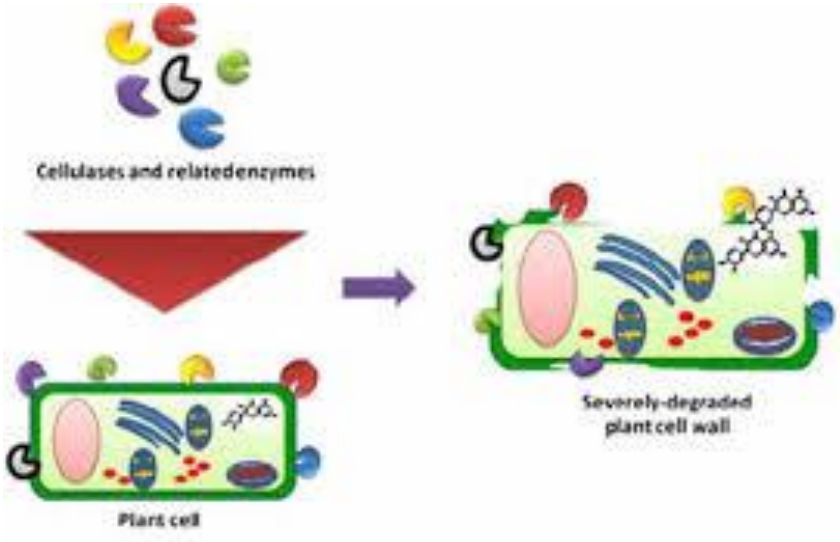
Cell disruption is a technique or process used to release and isolate biological molecules from inside a cell. Ultra sonication is a highly efficient method to perforate and disrupt cell walls and membranes so that the intracellular material and the targeted biomolecules are released into the solvent.

The breakage of cells using nonmechanical methods is attractive because it offers the prospect of releasing enzymes under conditions that are gentle, do not subject the enzyme to heat or shear, may be very cheap, and are quiet to the user.
Each method has its drawbacks, but may be particularly useful under certain specific circumstances.



The ultrasonic cell disrupters are effective for :

- DNA/RNA shearing
- homogenization
- cell lysis
- protein extraction
- and general sample preparation.



Cobas analyzer

Is a fully automated analyzer that uses Electro Chemi Luminescence (ECL) technology for immunoassay analysis.

It is designed for both quantitative and qualitative determinations for a broad range of applications including:

- anemia
- critical care
- bone
- fertility
- cardiac
- hormones
- tumor markers
- infectious diseases

Thank you for listening