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17/mhs06/042

BIOTECHNOLOGY

SOCIO-ECONOMIC IMPORTANCE OF MODERN CELL BIOLOGY TECHNIQUES .

Cell biology Techniques are used to study the physiological properties of cells, their structure, the organelles they contain, interactions with their environment, their life cycle, division, death and cell function. Few of such techniques are:

I.)Immunofluorescence microscopy.

II.)Ion-exchange chromatography.

III.)Affinity chromatography.

IV.)Enzyme immunoassay.

V.)Radioimmunoassay, among others.

These techniques have played a variety of roles in the cell biology that cannot be over emphasized. For instance, they have to a large extent contributed socially and economically to the world at large. Some of these techniques and their contributions would be examined below:

AFFINITY CHROMATOGRAPHY

Affinity chromatography is a method of separating biochemical mixture based on a highly specific interaction between antigen and antibody, enzyme and substrate, receptor and ligand, or protein and nucleic acid. It is a liquid chromatography technique for separation and analysis of bio molecules based on their biological functions . It has become an increasingly useful method of separation in pharmaceutical science, Biochemistry, biotechnology and environmental science in recent years. It is known as the most specific and effective technique in protein purification.

ENZYME IMMUNOASSAYS

Enzyme immunoassays (EIAs) use antibodies to detect the presence of antigens. Enzyme immunoassays are attaining increased usage for the direct detection of microbial antigens in body fluids. One of the advantages of the EIAs includes a high degree of sensitivity resulting from the detailed magnification of the enzyme-substrate reaction. Enzyme immunoassays have been developed for the effective detection of several important microbial antigens in body fluids, including antigens of rotavirus, hepatitis B virus, and Haemophilus influenzae type b.

ION-EXCHANGE CHROMATOGRAPHY

Ion-exchange chromatography (IEC) is part of ion chromatography which is an important analytical technique for the separation and determination of ionic compounds. Ion chromatography separation is based on ionic (or electrostatic) interactions between ionic and polar analytes. This chromatography is one of the most important adsorption techniques used in the separation of peptides, proteins, nucleic acids and related biopolymers which are charged molecules in different molecular sizes and molecular nature. The separation is based on the formation of ionic bonds between the charged groups of biomolecules and an ion-exchange gel/support carrying the opposite charge.

IMMUNOFLUORESCENCE MICROSCOPY

Immunofluorescence (IF) microscopy is an important, often decisive tool to reach diagnosis of most dermatological and infectious cutaneous diseases. Immunofluorescence is a technique used for light microscopy with a fluorescence microscope and is used primarily on microbiological samples. This technique uses the specificity of antibodies to their antigen to target fluorescent dyes to specific biomolecule targets within a cell, and therefore allows visualization of the distribution of the target molecule through the sample.

RADIOIMMUNOASSAYS

Radioimmunoassay (RIA) is an in vitro assay that measures the presence of an antigen with very high sensitivity. Immunoassays have virtually replaced bioassays for detection of pregnancy. Radioimmunoassay is ideal for diagnosis of early and ectopic pregnancies due to its high sensitivity.