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BIOPHARMACEUTICAL:

Through advanced methods in biotechnology, biopharmaceuticals were produced safely and quickly for treating illnesses. Furthermore, biopharmaceuticals do not contain any chemicals and use targeted organisms to synthesize the medicine successfully. Big molecules of proteins are the typical origin of biopharmaceuticals. When they are inside the human body, they target dangerous and hidden parts of the disease and obliterate them. Today, scientists and researchers are aiming to extend and develop biopharmaceutical medicines which can be used to fight diseases related to heart, hepatitis and cancer

PHARMACOGENOMICS

Pharmacogenomics is the technique that leverages the person's heredity information to choose the best biotechnological medicine for their illness. This studies the body system's response to certain medications. To put it simply, this is the combination of advances in pharmaceuticals along with genomics. The end goal of this application is to improve medicines that are specifically targeted to a person in lieu with his genetic makeup to ensure effective treatment of illness. The end goal of this branch of medical science is to effectively produce biotechnological medicines which are placed in the patient's body in accordance with his genetical makeup.

With the use of pharmacogenomics, medical companies can produce medicines that depend on the proteins, compounds, and RNA particles based on the chosen qualities and infections applicable. Synthesized medicines are almost guaranteed to improve remedial effects, in addition to diminishing harm to other nearby cells. With the knowledge of the person's hereditary inclinations, specialists can ascertain how well the patient's body can prepare and process a medication and decide the correct amount of medication doses. As a result, an accurate prescription will be given, and the chance of overdose is mitigated.

RAPID DEPLOYMENT OF VACCINES

A global pandemic is a real issue and has always proven its powerful grip on humanity. Through Biotechnology, scientists and researchers can quickly pinpoint precursors or markers that can cause severe illnesses and diseases. As a result, they can synthesize vaccines quickly against any dangerous pandemic sickness. In a study on vaccines and biotechnology, researchers found a great decline in illnesses when patients were administered with a vaccine produced through biotechnology.

Tissue nanotransfection.

Tissue nanotransfection works by injecting genetic code into skin cells, which turns those skin cells into the other types of cells required for treating diseases. In some lab tests, one touch of TNT completely repaired the injured legs of mice over a period of a few weeks by turning skin cells into vascular cells. And reportedly, this biotech can work on other types of tissue besides skin. The potential for this type of gene therapy is huge, from helping car crash victims to active duty soldiers. Medical biotechnology has made this advancement possible, and the continued research and testing will only help improve this tech and adopt it across hospitals and medical centers

Recombinant DNA technology.

Recombinant DNA technology is combining DNA molecules from two different species, and then inserting that new DNA into a host organism. That host organism will produce new genetic combinations for medicine, agriculture, and industry. There are many examples of recombinant DNA technology being utilized, from biopharmaceuticals and diagnostics, to energy applications like biofuel, to agricultural biotechnology with modified fruits and veggies. The genetically modified products are able to perform better than the regular medicine or produce. Recombinant agriculture is able to be more pest resistant or weather resistant, recombinant medicine like insulin is able to better work with bodies, etc. Because of the many benefits that recombinant DNA holds for a variety of products, researchers are optimistic about the future it has within biosciences, and in other industries as well.

Molecular Diagnosis

i) Polymerase Chain Reaction (PCR)

Normally, we can detect a pathogen (bacteria, virus etc.) only when the disease symptoms start to appear. However, by this time, the pathogen concentration in the body is very high using a technique called PCR. PCR involves amplification of the nucleic acid in the pathogen allowing us to detect the pathogen at very low concentration. Today, we use PCR routinely to detect HIV in suspected AIDS patients and to detect gene mutations in suspected cancer patients.

ii) Enzyme-Linked Immunosorbent Assay (ELISA)

The basic principle of ELISA is antigen-antibody reactions. ELISA can diagnose infections by detecting the presence of antigens (proteins of the pathogen) in the patient serum or by detecting the antibodies produced against the pathogen.

iii) In Situ Hybridisation

This technique involves tagging a single-stranded DNA or RNA with a radioactive molecule (probe). This then hybridizes with its complementary DNA in a clone of cells. On detection using autoradiography, the clone with the mutated gene will not appear on the photographic film because the probe is not complementary to the mutated gene.