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**QUESTION;**

 Discuss in details the aspects of medical biotechnology

**ANSWER;**

The field of Medical Biotechnology includes research and development of technology used in the medical, agricultural and pharmaceutical industries. Medical biotechnology is the use of living cells and cell materials to research and produce pharmaceutical and diagnostic products that help treat and prevent human diseases. Most medical biotechnologists work in academic or industrial settings. In academic laboratories, these professionals conduct experiments as part of medical research studies; industrial biotechnologists work toward developing drugs or vaccines. The medical biotechnology field has helped bring to market microbial pesticides, insect-resistant crops, and environmental clean-up techniques.

 The field of medical biotechnology is experiencing rapid growth in recent years, leading to the development of several innovative techniques for preventing, diagnosing, and treating diseases. Novel methodologies, including polymerase chain reaction, gene sequencing, fluorescence in situ hybridization, microarrays, cell culture, gene silencing using interference RNA, and genome editing, have significantly contributed towards improving health science, such as the sequencing of the human genome, use of stem cells for regenerative medicine, tissue engineering, development of antibiotics, and the generation of monoclonal antibodies for therapy . If the current growth rate continues, medical biotechnology will soon become a major pillar of health science.

From cancer research to agriculture advancements, medical biotechnology has many promising avenues of technological growth that has the potential to help many people. The following aspect where medical biotechnology has improved or brought about are;

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.

GENETIC TESTING FROM 23AND ME; netic and ancestry kits are popular these days, and they are beneficial for more than just helping people understand their genetics and heritage. New studies are showing that saliva kits are able to test for things like breast cancer by looking at gene mutations. Certain races are also more likely to inherit certain mutations or human diseases, and knowing what races make up your genetic material can help you be prepared. While 23andMe test results shouldn’t be a reason to make decisions about treatments, understanding your heritage and how that could impact your health is valuable.

While there are great advancements and positives to medical biotechnology, anything this fast-growing and powerful is bound to come with some concerns and issues. Medical biotechnology is a controversial medical topic, with medical ethical issues associated.

RISK TO HUMAN LIFE IN CLINICAL TRIALS.

A huge risk of medical biotechnology is its impact during clinical trials. Because it’s such new tech, people can and have gotten hurt and even died during trials of the technology. Because of these risks, extensive research should be performed before even thinking of introducing tech to human subjects, and those who are participating in a trial should be extremely aware of any and all possibilities. Unfortunately, the paradox is that many times people who are sick are willing to try new things for the chance to get cured. This means researchers and doctors have a huge ethical responsibility to truly outline for a patient what the costs may be, and respect their ultimate decision.

HIGH COST MAY EXCLUDE THE POOR.

While medical biotechnology has huge potential to make medicine more efficient and easy, what’s the cost? This technology is often hugely expensive compared to traditional treatments. There is an ongoing give and take about finding new medical advancements, and the cost it takes to do research and then market the findings for purchase. There is also the concern that high costs of tech treatments can exclude an entire class of people from being able to utilize them. This is also a huge give and take, with science and medicine having a responsibility to help all patients, not just those who are wealthy enough to buy the best care.