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Commentary

Objectives of the Biological Engineering and it's Sub-disciplines

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DESCRIPTION

Biological engineering or bioengineering is the application of principles of biology and the tools of engineering to create usable, tangible, economically-viable products. Biological engineering uses knowledge and expertise from a number of pure and applied sciences such as mass and heat transfer, kinetics, biocatalysts, biomechanics, bioinformatics, separation and purification processes, bioreactor design, surface science, fluid mechanics, thermodynamics, and polymer science. Biological engineering has many uses, but ultimately focuses on saving lives and making lives better. The more problems we run into, the more biological engineers will continue to work to address those problems with biotechnology. Because of this, it's a constantly evolving industry [1,2].

Sub-disciplines

The utilization of engineering ideas and design concepts in medicine and biology for healthcare is known as Biomedical Engineering (BME) or medical engineering (e.g., diagnostic or therapeutic). Biological engineering is also referred to as "bioengineering," which is another name for BME. By fusing the design and problem-solving abilities of engineering with the medical biological sciences, this discipline aims to bridge the gap between engineering and medicine and develop medical treatment, including diagnosis, monitoring, and therapy [3-6].

Tissue engineering: Tissue engineering, a subfield of biomedical engineering, uses cells, engineering, materials science, and the proper biochemical and physicochemical components to replace, enhance, or repair different forms of biological tissue. Tissue engineering is not just restricted to applications using cells and tissue scaffolds; it also frequently involves the utilization of cells positioned on tissue scaffolds in the development of new living tissue for medicinal purposes.

Genetic engineering: The technology-based modification and manipulation of an organism's genes is known as genetic engineering, sometimes known as genetic modification or genetic manipulation.

Biochemical engineering: The discipline of biochemical engineering, commonly referred to as bioprocess engineering, has roots in both chemical engineering and biological engineering. It primarily focuses on the development of unit processes that use biological creatures (such enzymes in fermentation) or organic molecules (typically enzymes) and has a variety of applications in areas of interest like biofuels, food, medicines, and water treatment processes.

The analysis of biological systems, such as the human body, in conjunction with the study of mechanics, or mechanical applications, is known as biomechanics. In order to develop solutions that will protect and also enhance the health of living organisms as well as enhance the quality of the environment, environmental engineering is a professional chemistry, biology, ecology, geology, hydraulics, hydrology, microbiology, and mathematics are all included in the engineering field [7-9].

Environmental engineering: It is the practice of using engineering and scientific ideas to preserve and improve the environment in order to: Protecting human health, maintaining healthy ecosystems in nature, and enhancing human life quality through environmental enhancement are all important goals. Three-dimensional (3D) bio printing is the use of methods similar to 3D printing to mix cells, growth factors, and/or biomaterials to create biomedical parts, frequently with the goal of mimicking the properties of natural tissue. Typically, 3D bio printing uses a layer-by-layer technique to deposit substances known as bio-inks to produce tissue-like structures that are subsequently used in many medical and tissue engineering sectors. To aid in the research of medications and prospective cures, tissue and organ models can be printed via bio printing.

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