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Editorial on Biomedical Engineering

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Editorial

The application of engineering ideas and design concepts to medicine and biology for healthcare reasons is known as biomedical engineering (BME) or medical engineering (e.g., diagnostic or therapeutic). BME is also known as "bioengineering," but the term has come to refer to both BME and biological engineering. This area aims to bridge the gap between engineering and medicine by combining engineering's design and problem-solving talents with medical biology to advance health-care treatment, such as diagnosis, monitoring, and therapy. A biomedical engineer's responsibilities also include the administration of existing medical technology in hospitals while conforming to industry standards. This profession, also known as a Biomedical Equipment Technician (BMET) or clinical engineering, entails making equipment recommendations, procurement, routine testing, and preventative maintenance.

In comparison to many other engineering topics, biomedical engineering has just lately evolved as a distinct field of study. A new field's progression from being an interdisciplinary speciality within already-established topics to being deemed a field of its own is common. Much of the work in biomedical engineering is research and development, which covers a wide range of topics. The development of biocompatible prostheses, various diagnostic and therapeutic medical devices ranging from clinical equipment to micro-implants, common imaging equipment such as MRIs and EKG/ECGs, regenerative tissue growth, pharmaceutical drugs, and therapeutic biologicals are all examples of prominent biomedical engineering applications.

Bioinformatics is an interdisciplinary science that focuses on developing methods and software tools for analysing biological data. Bioinformatics is an interdisciplinary discipline of study that analyses and interprets biological data by combining computer science, statistics, mathematics, and engineering. Bioinformatics is a phrase that refers to both a broad category of biological investigations that involve computer programming as part of their technique and to specialised analysis "pipelines" that are often used, especially in the field of genomics. Bioinformatics is frequently used to identify potential genes and nucleotides (SNPs). Such identification is frequently done in order to better understand the genetic basis of illness, unique adaptations, attractive features (especially in agricultural species), or population variances. Bioinformatics also aims to comprehend the organising principles inside nucleic acid and protein sequences in a less formal approach.

The direct manipulation of an organism's genes is referred to as genetic engineering, recombinant DNA technology, genetic modification/manipulation (GM), and gene splicing. Genetic engineering, in contrast to conventional breeding, which is an indirect approach of genetic modification, uses contemporary methods like molecular cloning and transformation to directly modify the structure and features of target genes. In a variety of applications, genetic engineering approaches have shown to be successful. Crop technology advancements (not a medical application; see biological systems engineering), the production of synthetic human insulin using modified bacteria, the production of erythropoietin in hamster ovary cells, and the development of new experimental mice such as the oncomouse (cancer mouse) for research are just a few examples.

Clinical engineering is a subset of biomedical engineering that deals with the actual application of medical devices and technology in hospitals and other clinical settings. Clinical engineers' responsibilities include training and supervising biomedical equipment technicians (BMETs), selecting technological products/services and logistically managing their implementation, collaborating with government regulators on inspections/audits, and serving as technological consultants for other hospital employees (e.g. physicians, administrators, I.T., etc.). Clinical engineers also advise and consult with medical device manufacturers on potential design improvements based on clinical experiences, as well as monitor the state of the art so that procurement patterns may be redirected properly.

Biomedical sensors based on microwave technology have gotten a lot of interest in recent years. Microwave sensors, for example, can be used as a supplementary tool to X-ray to monitor lower extremity injuries, and different sensors can be produced for specialised usage in both diagnosing and monitoring illness conditions. When measuring at different stages during the healing process, the sensor monitors the dielectric properties and may thus detect changes in tissue (bone, muscle, fat, etc.) beneath the skin, thus the response from the sensor will vary as the wound heals [1-5].

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