

# Biology and Medicine: A Multidisciplinary Approach for Promoting Healthy Life

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## INTRODUCTION

Biology and Medicine, also termed as medical biology deals with the structural and functional aspects of biological organisms and their organization, the related biological principles underlying growth and development as well as cellular and molecular biology pertaining to the diagnosis and treatment of various medical conditions. This field of study deals with designing and development new and precise drugs, medicines and other innovative approaches. The major topics of research associated with biology and medicine includes cellular biology, developmental biology, pathology, physiology, immunology, evolutionary biology, biomaterials, cancer biology, and nuclear, alternative and herbal medicines.

Medical biology has great relevance for several professionals including clinical scientist, medical interns, dental and osteopathic doctors, veterinary and nursing professionals. Medical biology is truly multidisciplinary in nature covering wide range of topics including mathematical optimization, computation techniques, physics, radiation science, hormonal signaling, material science, regenerative medicine, epigenetics, electromagnetism, cell and molecular biology, free radicals, ergonomics, nanotechnology, evolution and adaptation biology.

The importance of molecular and cell biology including molecular genetics and proteomics has grown in helping understand the modern cellular physiology and the use of medicine for treatment of

various disorders. Several biological and bio-medical phenomenon can be modeled into mathematical and computational techniques in order to predict the drug action and interactions as well as to optimize various parameters. The subject has great relevance for disease prediction including that of cancer, cardiovascular disease, targeted drug delivery; control of pandemics and epidemics, development of cancer therapeutics, medical decision making process, drug designing and development.

Biomaterials have great relevance to biology functioning. There has been great improvement in the development of biomaterials for use as artificial parts and organs. Biodegradable and biocompatible materials, silicone based compounds and ceramics were used for several biological applications. Nanotechnology has great relevance in biology and medicine. Nanotechnology has substantial impact on biology and medicine and has in fact revolutionized the field of medicine. The next generation innovations in genomics and proteomics depend on nanotechnology. Nanotechnology based detection of biomarkers for preemptive diagnosis of disease conditions, characterization of sub-cellular interactions, nanosensors, nanocarriers for targeted and safe drug delivery.

Regenerative biology and medicine is one of the rapidly growing fields of medical science. Regenerative medicine deals with scientific study of biological regenerative mechanisms, optimization of therapeutic approaches for restoration of tissues and organs by means of cell transplantation, user of synthetic tissues, or induction of cellular regeneration using drugs and medicines.

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