Editorial

Advancing the Future of Medical Sciences and Biotechnology

Welcome to International Journal of Medical Sciences and Biotechnology (IJMSB), the first regular issue of volume one. IJMSB offered a platform for researchers, academicians and students to share their knowledge and scientific experience in the niche areas across medical sciences and biotechnology.

Medical science is the art of healing or clinical practice of the diagnosis, treatment, management and prevention of diseases. It's no longer looks like a neutral method of inquiry and foresees that biotechnology can simply provide us with a new set of applicable tools for curing, preventing and predicting diseases. Medical research and biotechnology are rapidly growing fields that centered on the biological mechanisms of human health and diseases, by providing new procedures and therapeutic agents.

Biotechnologists have taken several steps to develop new vaccines includes live, attenuated, inactivated, subunit, toxoid, conjugate, recombinant vector and DNA vaccines to alleviate major health threats that covered malaria, AIDS and tuberculosis. Genetic engineering has been applied to produce better and affordable vaccines for example tomatoes and bananas have been genetically modified to insert hepatitis B vaccine in their DNA sequence. Biotechnology also helps to improve the effectiveness of anti-cancer treatment via the production of monoclonal antibodies. Besides, genetic engineered Golden Rice was developed to increase the amount of nutrition and for preventing malnutrition in developing countries.

Personalized medicine is a new paradigm that manages patients' disease based on individual characteristics. In contrast, pharmacogenetics studied on the mechanisms of drug response controlled by patients' genetic make-up. By exploring the individuals' genetic profile, doctor will be able to prescribe the exact medication at the optimal dosage. Therefore, the risk for drug resistance, adverse reactions and side effects would be minimal. Recently, FDA had approved a personalized prostate cancer medicine that boosts patients' immune cells to recognize and kill the cancer cells. The first medicine for osteoporosis was approved by FDA based on genomic profiling study.

Gene therapy involves the insertion of genes into the cells and/or tissues of patients through recombinant DNA technology. This field is focuses on patients with severe and life-threatening diseases, to who have limited treatment options and failed on the available therapies. Essentially, gene therapy changes the genetic message or instructions of body cells to treat diseases. Currently, scientists are investigating on how the gene therapy can treat certain type of cancers by enhancing patient's immune system (T-cell receptor approaches) and by targeting cancer cells (pro-drug approaches). Researchers utilize vectors to deliver new gene (often viruses or liposomes) into cancer cells in order to transform them to be more vulnerable to radiation and chemotherapy.

Stem cells are undifferentiated cells that can regenerate and multiply indefinitely, and eventually develop into differentiate forms with specialized functions. Stem cell therapy can be directed toward a desired cell type by adding different growth factors, to replace the bad cells, damaged tissue and recover as normal. Therefore, regenerative medicine is aiming to replace the damaged cells with disease-free cells by hoping that stem cells could be regenerative cells and tissues to treat diseases. Recently, ReNeuron initiates a clinical trial of a neural stem cell line in treating stroke patients. In addition, Neuralstem initiates another clinical trial using human embryonic stem cells to treat amyotrophic lateral sclerosis patients.

Nanobiotechnology deals with the manipulation of molecules and structures on a nanometer or atomic scale, while Nanomedicine is applied for the improvement of human health. For example, nanoshells are able to target the cancer cells by capturing infrared light and convert it to heat through the skin of cancer patient. Another example is microspheres that used to treat lung cancer and respiratory illnesses, by delivering as a mist sprayed into the nose or mouth. Researchers have developed “lung on a chip” as a model for testing environmental toxins and pathogens that triggered inflammatory response, and also predicting the absorption of aerosolized therapeutics and safety of new drugs.

System Biomedicine integrates Systems Biology to understand the complex pathological processes in humans, animal and cellular models. It is interesting to note that Systems Biology aims to modeling exhaustive networks of interactions mainly at intra-cellular level. With the availability of whole genome sequences, both mono- and multi-cellular are combining the technological advances to allow the analysis in the levels of mRNA, proteins, metabolites and post-translational modifications. This will allow a quantitative description of biological processes at the level of single cells, organs and ultimately entire organisms. System biology is applied with bioinformatics tools in order to process the biological data. Bioinformatics is an advanced and sophisticated computer system that used to handle unlimited information generated from research of biological molecules.

Currently, we are entering to an important era of “Omics” with diverse attributes embraced by genomics, pharmacogenomics, proteomics, cytomics, exomics, transcriptomics, connectomics, interactomics, regulatomics, epigenomics, metabolomics, foodomics, metagenomics, and related fields. IJMSB is not limited to the fields of molecular diagnostics, biomarker discovery, cellular and molecular therapies, molecular medicine, genome based medicine, translational medicine, stem-cells therapy, gene therapy, medical oncology, neurobiology, biochemistry, immunology, microbiology, bioinformatics, systems biology, synthetic biology, computational biology, molecular biophysics, structural biology, biosensors, bioelectronics, biomaterials, nanobiotechnology, nanobiomedicine, drug design and discovery, pharmacology and pharmaceutical sciences. IJMSB will cover all the aspects from basic and clinical research in medical sciences and biotechnology, to provide new insight in improving human health and well being.

New knowledge is being captured every day; IJMSB will definitely be successful in disseminating the best of advanced researches, with great emphasis on the applicability of the works. Therefore, IJMSB sets an aim to ensure high quality publications for the benefit of the medical and scientific communities. First screened manuscripts will be sent to at least two experts for peer reviewing. Decision regarding the manuscript acceptance will be made based on the reviewed reports and scoring within 4 weeks. We encourage our Editorial Board members as well as our referees to be motivated critical advisers to improve the submitted manuscripts. We believe in the future this journal will bring our audiences to the advancement and cutting edge technologies in addressing updated issues. In order to do this, we are relying heavily upon your comments, research papers, review, case report, book review, thesis and latest research projects that push forward the boundaries of Medical Sciences and Biotechnology.

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