

Bio Medical Sciences: The Future

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Editorial

In the early nineteenth century, most of the doctors followed their clinical expertise to treat the patients. Due to the availability of investigations in the mid-nineteenth century, many doctors rapidly and enthusiastically included laboratory investigations in their clinical practice. During the post-World War II period the term "biomedicine," was coined which became a common word for the doctors and scientists. As the focus increased on the role of proteins and amino acids made the bio medical science into "molecularization" and "macromolecularization" of biology and medicine.

It increased the homogenization of the methods and techniques used to study fundamental life phenomena and those applied to the investigate diseases. Studies of recent biomedicine grew rapidly in the latter half of twentieth century. Biomedical sciences are a hybrid domain, intersecting with many other scholarly disciplines. It involves those science disciplines whose primary focus is the biology of human health and disease. Those disciplines are the basic science like anatomy, physiology, cell biology, molecular biology, biochemistry, medical microbiology, genetics, immunology and statistics. It also includes clinical virology, clinical epidemiology, genetic epidemiology, bioinformatics and biomedical engineering. To demarcate between "medicines," "science," and "industry" became more difficult as the medicine started relying on technologies, instruments, and drugs.

Three Phases of Biomedical science:

- An early phase based on magic and ritual.
- A rational phase based on the creative imagination.

- A modern phase based on laboratory investigation and experimental design.

Modern Phase of Bio Medical Sciences

The 20th century, biology stressed on the analysis of different components of living systems but 21st century, biology had to concentrate on understanding how different components of living collaborate and create complex biological systems and then promote the results into practice. At the turn of the 21st century a major event took place that is the determination of the entire sequence of the human genome, essentially the "blueprint" of human life. So far only about 20 per cent of the information that the genome contains have been read and interpreted. It will take another half century to complete the task. The present knowledge of the genome is sufficient to be "translated" into medical practice which will help us to appreciate the extent to which our genomes differ from person to person. Human Biology is much more complicated than just deciphering the genome. Hundreds of thousands of different biomolecules and small chemicals move around in our body, connecting different organs like the heart, liver, lungs and gastro intestinal system and they are controlled by one of the most complex organs, the Human Brain. Genes usually contain essential information to produce functional products such as proteins which will perform the important functions in the body, for example as enzymes and hormones.

The process by which genetic instructions are used to make gene products is called "gene expression". They will follow the biological and chemical processes in cells and organs and study how they determine development and ageing of a person and how he responds to the

environment. Control of gene expression is necessary to produce the desired gene products when needed. Man combats the infections, foreign invaders and preserves the healthy normal functions by elaborate defense mechanism. In the recent days much progress has been made in understanding the role of human genetic variation in many diseases. Genomic medicine will develop so that each individual's genetic print will be available to doctor and he will use it to make clinical decisions about preventing ill health or treating a person's specific condition. Foremost we have to understand the molecular mechanisms by which the genetic variations affect complex human diseases. So we have to make variation in the drug treatment to each individual patient's need and it has to be "personalized" or "precision" medicine.

Recent advances in immunology will provide new types of therapies for cancers, or by suppressing the immune

response in arthritis, diabetes and multiple sclerosis. In the recent years a bio-psychosocial approach has been promoted particularly in relation to chronic conditions such as musculoskeletal conditions, rheumatoid arthritis and chronic pain, where the physiological and psychological factors and work pattern is very important. The professions like nursing, occupational therapy, physiotherapy have embraced bio-psychosocial model. In conclusion biomedical science has been a dynamic model and played an important part in people's understandings of health and illness. Proponents of biomedicine suggest that it stands with many fantastic accomplishments like reduction of morbidity and mortality rates by eradication of many communicable diseases due to infection and controlling non-communicable diseases like hemophilia, cystic fibrosis, peripheral arterial disease, cancers. The future is Integration of molecular physiology, biology, chemistry and engineering.