

**THE SCOPE AND CHALLENGES OF MEDICAL BIOCHEMISTRY**Subrata Kumar Biswas<sup>1</sup>, Subhagata Choudhury<sup>2</sup>

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Medical Biochemistry is the subspecialty of medical science that deals with biochemical analysis of body fluids and thereby helps in the screening, diagnosis, monitoring and management of most, if not all, human diseases. As an academic discipline, Medical Biochemistry helps medical students and professionals understanding the key biochemical processes of human body such as metabolism and nutrition, cellular transport and signaling, enzyme activity, water, electrolyte and acid-base balance, blood coagulation, neuronal function, cellular homeostasis, growth, differentiation, cancer and gene expression. In addition to core biochemical investigations and emergency tests, the extensive repertoire of investigations that Medical Biochemistry provides for the diagnosis of diseases includes specialized investigations for the measurement of hormones, cancer markers, vitamins, trace elements, drugs and specific proteins. However, this long list of biochemical processes and investigations that the Medical Biochemistry encompasses is rapidly expanding due to the huge advancement of molecular biology and digital technology during the last 50 years. New investigations, new instruments and new methods are developing virtually every day. Therefore the newer scope and challenges of Medical Biochemistry are on the horizon and the Medical Biochemists need to immediately identify them and handle them appropriately so that Medical Biochemistry can serve the patients better as a medical subspecialty, and Medical Biochemists can

survive in the society with dignity as a medical professional. The conventional role that a Medical Biochemist so far played as a teacher in the medical institutes and a consultant in the clinical laboratory has been greatly challenged. Enormous advancement of knowledge and technology demands that the medical biochemistry curricula in undergraduate and postgraduate medical education should be immediately and extensively changed emphasizing more on clinical aspects of molecular and cellular biology and analytical chemistry. The teachers also need to update themselves to keep pace with the rapidly changing aspects of the discipline. The introduction of automation and laboratory information system, and the introduction of molecular diagnostics and proteomics approach in the clinical laboratory have greatly challenged the conventional role so far played by the traditional Medical Biochemists. The new generation Medical Biochemists who wants to work in the clinical laboratory as a consultant must learn and interpret various PCR techniques, next-generation DNA/RNA sequencing, liquid chromatography-tandem mass spectrometry (LC-MS/MS) and many others for the definitive diagnosis and monitoring of infectious disease, genetic disease, various cancers and inborn errors of metabolism. Without having the knowledge and technological update the Medical Biochemists would not be able to contribute to the newly developing field of personalized medicine and molecular

medicine. In addition to their role as a teacher and laboratory consultant, the Medical Biochemists can play an important role as a specialist physician to see and treat patients suffering from diabetes, metabolic and endocrine disorders. The Medical Biochemists are also at the forefront of biomedical research. The unique combination of biochemical and molecular knowledge and techniques makes the Medical Biochemists most suitable to be successful as a medical scientist as well as professional. Those who are interested in pursuing a research career should take a doctoral

degree. The Medical Biochemists can also take many non-traditional career paths such as working in a biotechnology and pharmaceutical industry and working as a quality control officer or laboratory consultant. The policy makers of the health sector and the professional society namely the Bangladesh Society of Medical Biochemists should take appropriate measures to face the challenges and utilize the future scopes of Medical Biochemistry.

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