

# Molecular Biology as a Tool to Understand Nature of Genes and Proteins

Liming Luo\*

\*Department of Pathology and Immunology, Baylor College of Medicine, USA

\*Corresponding author: Email: limingl@bcm.edu

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## Commentary

The crucial discovery of double helical structure of DNA by Watson and Crick in 1953 has brought had led to the beginning of Molecular Biology Field. Further discovery of central dogma by Francis Crick in 1958 brought much more attention to the field. In 1970s, molecular biology scientists started linking the field with other disciplines like genetics. Other milestone discoveries of the field are Genetic information id carried by DNA in 1944, DNA polymerase discovery in 1957, DNA denaturation in 1961, DNA isolation in 1869, DNA cloning in 1972, DNA sequencing techniques in 1975 and PCR development in 1985.

Advances in the field of Molecular Biology have enabled Life Science scientists to perform experiments and investigate characteristics of genes and proteins. Since 40 years, it has had great impact on all disciplines of Life Science. Now the molecular Biology techniques can be applied to interdisciplinary studies too. This has become possible due to technical advancements and several scientific discoveries in the field. The development of software tools further enabled to store the genomic and proteomic data in-silico and analyze molecular level data. This has changed the scenario of conducting research experiments not just in Molecular Biology but also in several other subject fields such as genetics, biochemistry, biophysics, cell biology and biotechnology. Examples include Next generation sequencing and recombinant DNA technology with which we can now understand genome, gene expression, DNA repair, DNA replication, regulatory pathways at complex level .

In Biomedical scenario, personalized medicine and drug discovery investigations also have Molecular Biology relevance. In last 20 years, biomedical research has just shifted from basic study of disease in patients and organs to molecular and cellular level now. This has become possible with the advent of newer and remarkable technologies that enabled isolation and sequencing of genes, understanding gene function, Within short time, Molecular Biology field has evolved to the extent that studies of human pathology aer now being conducted at the molecular level. Examples inculde Characterization of monogenic diseases, Cancer study at molecular and cellular level etc. Now the current knowledge of molecular biology is enough to develop efficient diagnostics and therapies in years to come.

Various molecular Biology techniques have been developed through extensive research and investigations for identification, isolation and manipulation of molecular components of cell viz., DNS, RNA and protein . These techniques include Molecular mapping, molecular cloning, Microarrays, Molecular probing and blotting, Gene delivery, DNA sequencing, Gel electrophoresis, Polymerase Chain Reaction (PCR) etc. Applications of Molecular Biology have been observed in Research, Diagnosis, Paternity testing, Pedigree verification, Forensic analysis, Gene therapy, Drig design and Genotyping. Bioinformatics filed emerged and taken genetic and proteomic analysis to the in-silico level. Many softwares have been developed to analyse and modify DNA sequence. These software suites offer various different feates like SNP analysis, miRNA analysis, genome and transcriptome assembly and analysis,

Thus, Molecular Biology field is ever developing for much more research investigations to be possible in Life Science disciplines.