

Medical Biotechnology and the Challenge of Chronic disease

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The field of Medical Biotechnology has changed our lives in the 21st century to a great extent in understanding our genome, proteome, metabolome, microbiome, pharmacogenomics, nutrigenomics, nanomedicine, regenerative medicine and so on and so forth. Though the cutting edge technologies are available for diagnostics and therapy, chronic diseases remain a challenging. In India chronic diseases are projected to account for 53% of all deaths. World Health Organization (WHO) projects that in India over the next 10 years more than 60 million people will die from a chronic disease and deaths from infectious diseases, maternal and perinatal conditions, and nutritional deficiencies combined will decrease by 15%. However, the deaths from chronic diseases will increase by 18%.

One such chronic disease is Crohn's disease which causes chronic inflammation of the intestine. It is caused by an abnormal innate immune reaction to intestinal bacteria in an individual of the appropriate genetic makeup. At Christian Medical College, Vellore, over a period of two

decades number of cases diagnosed with Crohn's disease is comparatively higher than that of TB.

TLRs and NOD receptor are two receptor families determine the balance between tolerance and inflammation. NOD2 mutations are associated with ileal crohn's disease in Western countries. Whereas those common NOD2 mutations (R702W, G908R, F1007S) are lacking in Indian patients. Also, known Single Nucleotide Polymorphism (SNPs) in Heat Shock Protein 70, Tumor Necrosis Factor alpha promoter, IL23 receptors are not found in Indian patients with Crohn's disease. Hence, based on the prior experience in immunopathology of the disease, our group has been working on identifying a unique immune footprint for Crohn's disease in Indians.

Using the model of inflammatory bowel disease in Indians, this talk attempts to show how focused research may provide clues that can be translated to therapy or to public health measures that treat or prevent diseases.