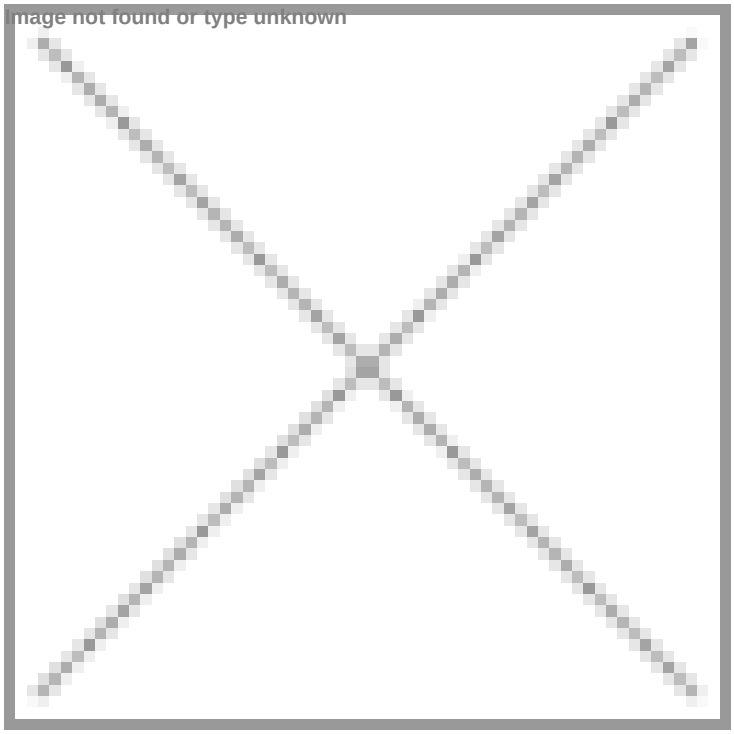
BioSpectrum the business of Bio & Health Sciences

# “Genomics holds immense potential in future outbreaks by identifying the genetic basis of infectious agents and chronic diseases”

01 February 2024 | Views | By Amguth Raju

**Tuberculosis (TB) has been a long-standing problem in India. To effectively treat TB, it is imperative to find newer targets, which are important for in-vivo bacterial survival and persistence. Hyderabad-based Centre for Cellular & Molecular Biology (CCMB), led by its director Dr Vinay Kumar Nandicoori, is working on finding new TB targets. In an interaction with BioSpectrum, he shed light on key focus areas of CCMB’s research in molecular biology and particularly genetic research in addressing personal and targeted medicines for patients suffering with TB, breast cancer and to identify various strains of viral and other communicable diseases.**




**Can you tell us about the challenges and goals of CCMB's research in TB?**

TB is a global concern, and India bears a significant burden. We face challenges in the continuous spread of the disease and the emergence of drug resistance in 15 per cent of patients. Our collaborative research involves sequencing clinical genomes of TB strains to identify novel mutations and understand prevalent strains in India, especially those contributing to drug resistance. In our labs, we aim to understand the basic mechanisms of Mycobacterium TB. Studying specific proteins helps us grasp their functions within the pathogen and the host. This fundamental research contributes to identifying potential therapeutic targets for drugs and enhances our understanding of how Mycobacterium TB operates.

**How do you see genomics contributing to the field of breast cancer research and TB?**

In breast cancer research, genetic sequencing helps ascertain the cause at specific stages. Identifying new mutations and changes in expression patterns correlated with cancer progression is vital. Through statistical analysis and validation in larger populations, we aim to develop biomarkers aiding in diagnosing and understanding the disease. Similar approaches are taken in tuberculosis research, emphasizing the potential of genomics in unravelling the complexities of these health conditions.

**Can you tell us the key focus areas in genomics and genetic research at CCMB, specifically in the development of targeted and personalised medicine?**

Our focus areas in genomics cover a wide spectrum, ranging from understanding genes' structure, function, and regulation to their impact on health, diseases, and evolution. Key areas include Personalised Medicine, Genomic Medicine, Population Genomics, Functional Genomics, Epigenetics, Human Evolution and Migration, Microbiome Research, Cancer Genomics, Infectious Disease Genomics, and addressing Ethical, Legal, and Social Implications (ELSI). These areas collectively contribute to advancing medical applications and insights into human biology. However, the challenge lies in the affordability of genomic sequencing for the entire population, especially for developing personalised medicines.

**Speaking of personalised medicine, how is genomics used in the study of rare genetic diseases, and what role does Exome sequencing play in this context?**

In case of rare genetic diseases, it becomes crucial to explore the genetic basis for accurate diagnosis. Utilising technologies like Exome sequencing, a cost-effective alternative to whole-genome sequencing, helps identify mutations in coding regions of proteins. This aids in understanding the genetic foundations of these diseases, providing valuable information for addressing complex medical conditions more effectively.

**How do you envision the future use of genomics in addressing major disease outbreaks, and what role does it play in gene therapy for cancer?**

Genomics holds immense potential in future disease outbreaks by identifying the genetic basis of infectious agents and chronic diseases. Take for instance the gene therapy for cancer; specific cohorts undergo sequencing to identify genetic markers associated with particular cancers, serving as biomarkers for faster and more accurate diagnoses. This selective and strategic use of genomics is crucial for maximising its impact on healthcare.

***Amguth Raju***