GOVERNMENT OF INDIA
MINISTRY OF SCIENCE & TECHNOLOGY
DEPARTMENT OF BIOTECHNOLOGY

LOK SABHA
UNSTARRED QUESTION No: 417
TO BE ANSWERED ON 27.11.2024

National Institute of Biomedical Genomics (NIBMG)

417 Shri Jagannath Sarkar:

Will the Minister of SCIENCE AND TECHNOLOGY
विज्ञान और प्रौद्योगिकी मंत्री

be pleased to state:

(a) the current research projects being undertaken at the National Institute of Biomedical Genomics (NIBMG) and their impact on healthcare and disease prevention in India;
(b) the specific contributions of NIBMG in the field of genomics that have led to advancements in personalised medicine and genetic research in India;
(c) whether the Government has plans to expand the infrastructure or initiate new research programmes at NIBMG in light of emerging global trends in genomics and biotechnology; and
(d) the extent of collaboration between NIBMG and international research institutions for joint studies and exchange of knowledge in the field of genomics?

ANSWER

MINISTER OF STATE (INDEPENDENT CHARGE) FOR THE MINISTERY OF SCIENCE & TECHNOLOGY (DR. JITENDRA SINGH)

विज्ञान एवं प्रौद्योगिकी मंत्रालय के राज्य मंत्री (स्वतंत्र प्रभार)
(डॉ. जितेन्द्र सिंह)

(a) The Biotechnology Research and Innovation Council (BRIC)-National Institute of Biomedical Genomics is devoted to enable genomic medicine i.e. to elucidate the genetic underpinnings of all major human diseases, particularly those that are of public-health importance in India, translate research findings to reduce the burden of disease. The research projects undertaken by the Institute aim to

provide a clear understanding of the disease and health; enabling prediction, prevention, therapy and gain of biological knowledge. The Institute works on cancers, complex diseases, infectious diseases and statistical and computational genomics. Some of the prominent projects currently ongoing at BRIC-NIBMG are on oral cancer, cervical cancer, breast, pancreatic, colon and lung cancer.

Additionally, BRIC-NIBMG is coordinating the recent One Day One Genome Initiative which is aimed at harnessing the Indian microbial potential of India in line with the BioE3 policy. Furthermore, BRIC-NIBMG is a major centre conducting the Genome India program. This initiative is aimed at creating a comprehensive genetic database of the Indian population that can contribute to the understanding of genetic diversity, disease susceptibility and population health in Indians.

(b) BRIC-NIBMG strives to translate the scientific knowledge to transform human health, focusing on health and disease issues that are of high relevance to our nation. Some of the specific contributions of BRIC-NIBMG in the field of genomics that have led to advancements in nalyzing ed medicine and genetic research in India are as follows:

i. A database on mutations in oral cancer in Indian patients have been made freely available to promote translational research. A gene panel has been developed for early diagnosis of oral cancer and leads on development of potential novel therapeutic interventions to treat oral tumours and prevent relapse, are being intensely pursued. A 3D organoid model and cell lines have been developed from oral tumours of Indian patients which will facilitate research on novel therapeutic targets.
ii. Clinical isolates are being tested with the method, which is more rapid compared to the culture-based method being currently practiced in the clinic. In the ongoing Indian Tuberculosis Genome Sequencing Consortium, the institute has already sequenced 3,053 drug resistant Mtb genomes.
iii. BRIC-NIBMG has undertaken the first GWAS on women delivering preterm birth in South-East Asia and identified population specific and trans-ethnic SNPs in the GARBH-Ini cohort. A panel of SNPs predicting the risk of PTB have been developed and their potential in early triaging of women at high risk of spontaneous preterm birth is being investigated. Vaginal microbial taxa associated with preterm birth were identified in Indian women providing clues to understand role of vaginal dysbiosis in enhancing preterm birth.
iv. BRIC-NIBMG scientists have identified 6 SNP/gene signature in Indians that are associated with NAFLD, as well as a 28 gene transcriptomic “signature” that changes during progression from mild to advanced stages of the disease.
v. Statistical models and software tools for nalyzing and integrating genomic data have been established and disseminated to accelerate discovery in biomedical genomics.

(c) The infrastructure of BRIC-NIBMG is being expanded to

maintain the eminent position of the Institute in genomics and biotechnology. In particular, many new facilities have been established and existing ones are being augmented. Some of important facilities are given below.

i. A BSL3 facility has been established. This facility enables BRIC-NIBMG scientists to study infectious agents that can cause serious or potentially lethal diseases.
ii. An animal research facility is being established and is on the verge of completion.

(d) BRIC-NIBMG has been engaged with international research organizations and participated prominently in international research initiative. The institute has been a prominent founding member of International Cancer Genome Consortium (ICGC) , Human Cell Atlas(HCA), Asian Immune Diversity Atlas (AIDA), Multi Omics of Mothers and Infants (MOMI) Consortium, Indo- French Centre for the Promotion of Advanced Research (CEFIPRA) and various international initiatives on SARS-CoV-2 genomics surveillance including one of BRICS countries (NGS-BRICS). Some of the international collaborations in which BRIC-NIBMG is involved in include Welcome Trust Sanger Institute (UK), , Broad Institute of MIT and Harvard (USA), University of Chicago (USA), Cincinnati Children's Hospital Medical Center (USA), University of California, San Francisco (UCSF) (USA), Genome Institute of Singapore (Singapore), RIKEN (Japan), Mahidol University (Thailand), Samsung Genome Institute (South Korea), National Laboratory for Scientific Computation – LNCC/MCTI (Brazil), Skolkovo Institute of Science and Technology (Russia), Beijing Institute of Genomics (China), Stellenbosch University (South Africa) and ICDDR, B (Bangladesh).

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