

GOVERNMENT OF INDIA
MINISTRY OF SCIENCE & TECHNOLOGY
DEPARTMENT OF BIOTECHNOLOGY

RAJYA SABHA
UNSTARRED QUESTION NO. 1410
ANSWERED ON 30.07.2026

Biotechnology and AI based research

1410: SHRI K.R.N. RAJESHKUMAR:

Will the **Minister of Science and Technology** be pleased to state:

- (a) whether biotechnology and AI-based research programmes have been expanded;
- (b) if so, the details thereof;
- (c) whether collaboration with academia and industry has increased; and
- (d) if so, the results achieved therefrom?

ANSWER

**MINISTER OF STATE (INDEPENDENT CHARGE) FOR THE MINISTRY OF
SCIENCE AND TECHNOLOGY & MINISTRY OF EARTH SCIENCES
(DR. JITENDRA SINGH)**

- (a) Yes, Government of India has expanded biotechnology and Artificial Intelligence (AI)-enabled research in computational biology, bioinformatics, genomics, healthcare, medical imaging, biomanufacturing, biological data science and in other areas in consonance of NITI Aayog's 'AI for All' strategy with guiding principles towards inclusive economic growth and social development.
- (b) The major initiatives undertaken are as follows:
 - 1. Theoretical & Computational Biology Programme, through Bioinformatics Centres under BTISNet across the country and various R&D projects by integrating biotechnology with AI, Machine Learning and advanced computational approaches, has played vital role in expanding AI based research programme in biotechnology.
 - 2. The Department is supporting AI-driven cancer imaging research for precision diagnostics through development of prediction models and algorithms. An Imaging biobank for cancer programme has also been supported in network mode.
 - 3. GenomeIndia Project has completed sequencing of over 10,000 Indian genomes, established a national biobank, developed genomic databases. The Department is promoting downstream research and indigenous precision medicine applications using GenomeIndia data through AI/ML tools.
 - 4. The Department has established a national repository for biological data - Indian Biological Data Centre (IBDC), with high-performance computing infrastructure. IBDC has seven specialized biological data repositories for equitable sharing of biological data.

5. The Department in collaboration with Bill & Melinda Gates Foundation (BMGF) implementing AI for Ultrasound (AI for USG) programme and catalysing equitable AI Use to Improve Global Health through Grand Challenges India (GCI).
 6. By establishing shared biomanufacturing infrastructure, the Department's Bio-AI Hub initiative actively powers AI-driven biological design, bioprocess optimization, and translational research under Biotechnology for Economy, Environment, and Employment Programme.
 7. The Anusandhan National Research Foundation (ANRF) supports biotechnology and AI-driven research through competitive funding schemes such as the Advanced Research Grant (ARG), Prime Minister Early Career Research Grant (PMECRG) and National Post Doctoral Fellowship (NPDF).
 8. ANRF has also expanded support through the Mission for Advancement in High-impact Areas (MAHA), including the Artificial Intelligence for Science and Engineering (AI-SE) programme, which promotes AI applications in climate science, advanced materials, biomanufacturing, medical imaging and other data-intensive fields. ANRF has also launched the MAHA MedTech Mission to foster affordable, high-quality indigenous medical technologies tailored to Indian and other resource-constrained settings.
- (c) Yes, the Government of India has strengthened collaboration among academia, research institutions, healthcare organizations, industry and start-ups through multi-institutional research project involving IITs, IISc, ICAR institutes, AIIMS, medical institutions, universities, national laboratories and industry partners across healthcare, agriculture and biotechnology. The GenomeIndia Consortium, Indian Biological Data Centre (IBDC) and Bio-AI Hubs are some of the examples of this collaboration. ANRF's Mission for Advancement in High-impact Areas (MAHA) supports priority-driven, multidisciplinary research through collaborative missions in areas such as AI, MedTech, EVs, drones and water, with industry participation and cost-sharing. The ANRF Translational Research and Innovation (ATRI) programme further accelerates validation, translation and commercialization of research through academia–industry partnerships.
- (d) Yes, expanding biotechnology and AI research initiatives has yielded key outcomes, including:
1. GenomeIndia project successfully completed 10,174 whole genome sequences, created a national genomic variation catalogue, established a biobank with over 20,000 biospecimens, and identified nearly 180 million genetic variants, including about 7 million novel variants.
 2. Developed a national AI-enabled medical imaging resource repository containing over one million radiology images and 20,000 pathology images of head neck cancer, enabling development of AI algorithms for precision oncology under Imaging biobank for cancer programme.
 3. Established a robust national ecosystem for AI-enabled biotechnology through initiatives like BioE3, BTISNet, IBDC, and dedicated AI research programmes in India. This ecosystem has led to development of AI-enabled tools and computational platforms for crop disease diagnosis, diabetic retinopathy screening, blood flow simulation, protein analysis, genome annotation, precision medicine and AI-assisted cancer diagnostics.

4. Under Grand Challenges India, the AI for USG programme is developing multi-site validations for AI-enabled ultrasound solutions targeting maternal and fetal health. By leveraging clinical datasets and research platforms from the Garbh-Ini programme, this initiative has successfully validated AI-based models across multiple clinical sites in India.
5. Under ANRF programmes, proposals promoting translational research and commercialization through academia-industry collaboration are presently under various stages of evaluation.
