National Conference on Quantum Biotechnology charts India's path in quantum-enabled life sciences

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India’s quantum science and life sciences communities came together at the National Conference on Quantum Biotechnology with representation from researchers, clinicians, industry leaders, startups, and students, to advance the translation of quantum science into diagnostics, biomedical imaging, drug discovery, and precision medicine, in alignment with India’s National Quantum Mission (NQM).

Prof. Umesh V. Waghmare, Secretary, Department of Science and Technology (DST), highlighted the strategic importance of quantum biotechnology while delivering the keynote address at the inaugural session of the one-day national conference hosted by Qmet Tech recently at the PC Saxena Auditorium on the IIT Bombay campus, Mumbai, Maharashtra. QMet Tech Foundation (Qmet) is the thematic hub (T-hub) for Quantum Sensing & Metrology set up under NQM at the Indian Institute of Technology (IIT) Bombay campus, with support from DST.

Quantum biotechnology sits at the intersection of quantum sensing, imaging, and computing with the life sciences - an emerging frontier where quantum-grade measurement is beginning to unlock biological questions that conventional instrumentation cannot reach. The conference was designed as an interdisciplinary platform to define national research directions in this space and to strengthen the pathway from laboratory demonstration to deployable healthcare technology.

“Unless we work on all sides of the technology in an integrated and strategic manner, we cannot take India ahead in the technology domain,” Prof. Shireesh Kedare, Director, IIT Bombay said, highlighting the institute’s role in convening interdisciplinary national platforms.

″Quantum biotechnology is where our sensing capabilities meet real clinical needs. At Qmet Tech, we are building quantum sensors of remarkable precision. The task now is to point them at the questions biology has been unable to answer. Bringing physicists, biologists, and industry into one room is how that translation begins," underlined Prof. Kasturi Saha, Project Director, Qmet Tech Foundation, on Qmet Tech’s quantum sensing capabilities and their application to biosensing.

"What struck me today is how much industry interest quantum biotechnology is attracting. Qmet Tech's role is to convert it into deployable technology, supporting startups, developing talent, and creating the manufacturing and testing capability India will need as these tools move towards the clinic, ″ said Hardik Joshi, CEO Qmet Tech Foundation.

The programme was structured around three sessions. These were on quantum for biology and the academic landscape, translating quantum biosensors--from lab to industry and innovating for applications in biosensing. A panel discussion was held on ‘Quantum Biotechnology in India: Opportunities, Challenges, and the Path Forward’.

Dr. JBV Reddy, Head, Quantum Technology Cell, DST, Dr. Rajneesh Gaur, Scientist 'F', Department of Biotechnology (DBT), Prof. Himadri Dhar, IIT Bombay, as well as Prof. Swaroop Ganguly, IIT Bombay, Mr. Hardik Joshi, CEO, Qmet Tech Foundation participated in the deliberations.

By bringing quantum sensing, imaging, computing, and biotechnology into a single forum, the National Conference on Quantum Biotechnology reinforced the National Quantum Mission's objective of building a collaborative, application-driven quantum ecosystem and positioning quantum-enabled life sciences as a priority frontier for India's research and healthcare innovation agenda.

Fig 1*: Prof. Umesh Waghmare, Secretary, DST, addressing the inaugural session of the national conference*

Fig 2*: A group photograph of conference participants.*

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