



Vishwa Bharti Public school, Noida

The March is On...

REPORT ON EDUCATIONAL VISIT TO ICAR–NATIONAL INSTITUTE FOR PLANT BIOTECHNOLOGY (NIPB)

DATE OF VISIT: 28th November, 2025

LOCATION: ICAR-National Institute for Plant Biotechnology (NIPB), New Delhi

PARTICIPATING STUDENTS: Students of Class XII-A (Biology)

PURPOSE OF VISIT

The primary objective of the visit was to provide the students with experiential learning in modern plant biotechnology. The visit aimed to bridge theoretical concepts from the CBSE Biology curriculum with real-world laboratory applications, allowing students to observe advanced biotechnological techniques, instrumentation, and ongoing research in the field of plant science. The visit also sought to expose students to scientific careers and ongoing research that directly shapes India's food security and crop improvement programmes.

OVERVIEW OF ICAR–NIPB

ICAR-National Institute for Plant Biotechnology stands as one of India's most significant research institutions devoted to molecular genetics, transgenic development, genomics, and advanced crop improvement technologies. Its role in strengthening India's agricultural framework has been critical. Although the Green Revolution began decades earlier, institutions like NIPB have carried its momentum forward by developing high-yielding, stress-tolerant, disease-resistant varieties that keep India self-reliant in food production.

HIGHLIGHTS OF THE VISIT

Interaction with Dr. Anshul Watts

The visit began with a detailed orientation led by Dr. Anshul Watts, a highly knowledgeable and deeply committed scientist at NIPB. His clarity, patience, and evident command over plant biotechnology immediately set the tone for the experience. He walked the students through the institute's objectives, ongoing research, and the scientific principles that govern modern crop improvement. His insights helped students contextualize how laboratory research translates into impactful agricultural solutions.

Visit to the Tissue Culture Laboratory

The first laboratory visit was to the Plant Tissue Culture Facility. Here, students observed the tissue culture of mustard (*Brassica juncea*), a crop of immense agricultural importance in India. Dr. Watts explained how tissue culture helps produce uniform, disease-free, high-yielding plants. Students were shown different stages—from callus initiation to the preparation of explants—and learned how plant cells, under the right conditions, can regenerate into full plants. Understanding how sensitive plant cells are to environmental changes helped students appreciate the level of precision required in laboratory-based crop production.



Microscopy and Molecular Instrumentation

The next segment of the visit combined advanced microscopy and molecular biology instrumentation. Students explored various types of research microscopes, including inverted, upright, stereo, and bifocal systems. They also observed key instruments such as the PCR thermal cycler and the Real-Time PCR machine, learning how scientists amplify DNA, quantify gene expression, and validate genetic modifications.

Demonstration of Gel Electrophoresis

One of the most engaging segments of the visit was the live demonstration of gel electrophoresis, where DNA fragments were separated based on size. Students observed the process from sample loading to the final visualization of bands. Watching the glow of separated DNA fragments in the gel tray—something they had only ever seen in diagrams, made the underlying science far more concrete and memorable. It transformed an abstract concept into an observable reality.

Closing Discussion

The final interaction with Dr. Watts involved an open discussion, where students asked questions about careers in biotechnology, research pathways, and the future of plant sciences in India. His responses were grounded, encouraging, and rich with real-world insights, leaving the students with clarity and direction about scientific fields they might pursue.



STUDENT REFLECTION

Mriganka Mukherjee (XII-A)

Experiencing plant biotechnology firsthand was extraordinary. I have always loved botany, so this visit felt like the perfect extension of that passion. The visit broadened my understanding of how vast and diverse the field of biology is, especially in terms of career opportunities. Observing real research facilities and interacting with a scientist made me realize the scale of possibilities within biotechnology, and it has significantly expanded my aspirations for the future.

CONCLUSION

The educational visit to ICAR-NIPB was an invaluable learning experience. It gave students a real and comprehensive view of the scientific methods that shape India's agricultural resilience and innovation. The interaction with a practicing scientist, the exposure to advanced laboratories, and the opportunity to witness live demonstrations made the visit intellectually stimulating and deeply motivating. Such experiences encourage students to appreciate the relevance of science in real life and inspire them to pursue knowledge with greater seriousness and enthusiasm.



Report by -
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