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IIT-Guwahati produces pluripotent stem cells from skin cells

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Holds potential in Stem Cell Therapy for the treatment of diseases like diabetes, cancer, paralysis, and Alzheimer's



Researchers from the Indian Institute of Technology Guwahati (IIT-G), in collaboration with scientists from Christian Medical College (CMC), Vellore, have reported a method to convert regular human skin cells into pluripotent stem cells.

Stem cells have to be extracted from embryos or parts of the adult human body like the brain or bone marrow, which is challenging from both ethical and practical aspects. Thus, scientists are exploring techniques to convert ordinary cells, like skin or blood cells, into pluripotent stem cells – stem cells that can be programmed to develop into any other form of an adult cell type.

These cells are called Induced Pluripotent Stem Cells (iPSCs). The most important advantage of iPSCs is their potential to produce patient-specific cells which can be transplanted to the site of injury or the site of tissue degeneration due to various disease conditions, and thereby, eliminate any chance of immune rejection.

The conversion of mature cells into iPSCs was first shown by Prof. Shinya Yamanaka, who won the Nobel Prize in 2012 for his discovery.

The iPSCs produced by the IIT-G and CMC researchers were versatile, maintained their genetic makeup well, and could potentially differentiate into a range of body cell types. Additionally, tests confirmed that the DNA structure of the cells was not altered and matched that of the original cells. Importantly, these iPSCs were found to be free from bacterial contamination.

"By generating iPSCs in Guwahati, we have opened up new opportunities for researchers to contribute to stem cell research", said Dr Rajkumar P. Thummer, Assistant Professor, Department of Biosciences & Bioengineering, IIT Guwahati,

Emphasising the significance of the research, Prof. Shaji Velayudhan, a collaborator from CMC, Vellore, said, "The generation of iPSCs is a major step forward in the field of regenerative medicine. It will not only facilitate local research in the North East of the country but also encourage collaborations with national and international institutions, ultimately benefitting patients in the region,"