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IIT Mandi discovers biochemical link between fatty liver disease and type 2 diabetes

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The findings offer new diagnostic and therapeutic tools for fatty-liver induced diabetes

A team of researchers at the Indian Institute of Technology (IIT) Mandi has unravelled the biochemical relationship between fatty liver disease and Type 2 Diabetes Mellitus (T2DM).

This understanding enables newer techniques to diagnose the risk of Diabetes among people with Non-Alcoholic Fatty Liver Disease (NAFLD). The findings of this research also offer new therapeutic pathways to control or even reverse fatty liver-induced diabetes.

This research is important for India because the prevalence of NAFLD is rapidly increasing in the country and recent surveys show that 40% of Indian adults suffer from it. NAFLD is often associated with Type 2 Diabetes, with nearly 50 million Indian adults having both diseases.

The multi-institutional research team analyzed blood samples extracted from fat-fed mice and human NAFLD patients. Both samples had high amounts of a calcium-binding protein termed S100A6. This protein is released by the fatty liver and serves as a communication link between the liver and the pancreas. S100A6 adversely affects theinsulin secretion ability of the ?-cells, thereby resulting in or exacerbating existing T2DM. At a biochemical level, S100A6 was found to inhibit insulin secretion by activating the Receptor for Advanced Glycation End product (RAGE) on pancreatic beta-cells.

Elaborating on the critical work, Surbhi Dogra, IIT Mandi, said, “Another important observation from our research was that the depletion of S100A6 improves insulin secretion and the regulation of blood glucose in mice, which suggests that S100A6 contributes to the pathophysiology of diabetes in NAFLD.”

Image caption- Dr Prosenjit Mondal, Associate Professor, School of Biosciences and Bioengineeringalong with his scholars Surbhi Dogra (R), and Priya Rawat (L)