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Scientists engineer novel insulin-delivery platform

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IIT Bhilai-led multi-institutional research team develops controlled insulin-delivery system



A multi-institutional team led by researchers from the Indian Institute of Technology (IIT) Bhilai, including scientists from Shiv Nadar Institution of Eminence, Delhi, NCR, and Shri Rawatpura Sarkar Institute of Pharmacy, Chhattisgarh, have successfully engineered a novel Insulin-delivery platform.

This hydrogel-based drug delivery system has the ability to release insulin in a controlled manner in response to elevated blood glucose levels- mimicking the natural insulin secretion process of healthy pancreatic cells.

Hydrogels are biocompatible polymers that are characterised by high water content and are being studied for controlled drug release in various medical fields including cardiology, oncology, immunology, wound healing, and pain management. The researchers encapsulated insulin in specially designed hydrogels that can be administered instead of direct insulin injections.

Through comprehensive experiments involving small-molecule drug analogs and macromolecular insulin, the team demonstrated that the hydrogels released insulin predominantly under hyperglycemic (high glucose) conditions. The safety and antidiabetic efficacy of insulin-loaded hydrogels were confirmed through tests in a type I rat model.

The study led by Dr Suchetan Pal, Assistant Professor, Department of Chemistry, IIT Bhilai, promises a safe and efficient method of supplying Insulin to insulin-dependent diabetic patients.