

JNCASR creates hydrogel for sustained insulin delivery

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A patent application has also been filed for this invention



Scientists at Bengaluru based Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), an autonomous research institute under the Department of Science and Technology, have recently developed an injectable Silk fibroin-based hydrogel for sustained insulin delivery in diabetic patients. A patent application has also been filed for this invention.

Prof. T. Govindaraju and his research team from JNCASR have developed the silk fibroin (SF) formulation using biocompatible additives and prepared an injectable SF hydrogel (iSFH) that can ease insulin delivery in diabetic patients.

The iSFH has demonstrated successful delivery of active insulin in rats, and the results have been published in the journal ACS Applied Bio Materials.

The JNCASR scientists have shown that subcutaneous injection of insulin with-iSFH in diabetic rats formed active depot under the skin from which insulin trickled out slowly and restored the physiological glucose homeostasis for a prolonged period of 4 days with no risks of low blood sugar through sudden burst of high concentration of insulin into the blood.

The viscous additives used by the team restricted the mobility of SF protein backbones and results in the rapid gelation. The microstructures provide mechanical strength (to support injectability), and porous morphology of iSFH allowed the encapsulation of human recombinant insulin in its active form in diabetic rats.

The JNCASR team hopes that pharmaceutical companies will come forward and further develop it for human use.