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[Biohybrid System]

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Islet graft for treatment of type 1 diabetes mellitus

Transplantation of the fiber encapsulating islet cells into kidney capsule.
(Nature Materials 2013)

Millimeter-thick fiber mitigated the foreign body reaction.
(Biomaterials 2020)

“Islet transplantation” is a treatment method for type 1 diabetes mellitus by transplanting insulin-producing pancreatic islets.
To protect the transplanted cells from host immune reactions, methods for the encapsulation of islets have been pursued worldwide. Our research group developed the implantation grafts that encapsulate islets in the fiber-shaped hydrogel and succeded in the control of the blood glucose concentration of diabetic mice and the subsequent retrieval of the implanted grafts. Currently, we focus on the fiber-shaped encapsulation of human iPS cell-derived islets, which can be a transformative donor-independent transplantation therapy.