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PRESS RELEASE

Geneva | 9 December 2025

The EU highlights UNIGE's bioartificial pancreas project

A European consortium led by UNIGE has developed a bioartificial pancreas that can restore normal blood glucose levels in people with diabetes — a breakthrough recognised by the European Commission's Innovation Radar.

Type 1 diabetes destroys the body's insulin-producing cells, forcing patients to rely on injections for life. Pancreatic islet transplantation can help, but donor organs are rare and require chronic immunosuppression. As part of the European VANGUARD project, led by the University of Geneva (UNIGE), scientists have developed an artificial pancreas capable, in experimental settings, of restoring glucose levels. Recognised by the European Commission's Innovation Radar, this work represents a major step forward in the fight against this disease, which affects more than 9 million people worldwide and could double by 2040.

After a five-year EU-funded effort — for an amount of 7 million euros — the [VANGUARD](#) project coordinated by the UNIGE has developed a bioartificial pancreas that restores normal blood glucose in preclinical models. Four innovations were independently recognised by the [European Commission's Innovation Radar](#) as having high market-creation potential — a distinction achieved by only ~14% of EU-funded innovations.

Led by Ekaterine Berishvili, Professor in the Department of Surgery and the Diabetes Centre, Faculty of Medicine, UNIGE, the VANGUARD consortium brought together Université Lyon 1 Claude Bernard (France), Ludwig-Maximilians-Universität München (Germany), Ospedale San Raffaele (Italy), Università del Piemonte Orientale (Italy) and Erasmus Universitair Medisch Centrum Rotterdam (Netherlands), combining expertise in cell biology, immunology, gene editing, biomaterials, transplantation and ethics. It set out to create a functional, scalable therapy using renewable cell sources and a biomaterial-based approach that also explores xenotransplantation — transplantation of cells, tissues or organs from one species to another — to overcome donor shortages.

As part of its work, VANGUARD delivered four core innovations:

- **Amniogel**, a UNIGE-developed hydrogel that protects transplanted cells and promotes vascularisation.
- **Pre-vascularised porcine islet organoids**, normalise glycaemia with half the cell dose of free islet grafts, and addressing human donor scarcity.
- **Porcine bioartificial pancreas**, restoring normoglycaemia in diabetic mice at lower cell doses.
- **Retrievable human bioartificial pancreas**, a pre-vascularised subcutaneous construct reversing diabetes in preclinical studies.



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Ekaterine Berishvili is the PI of Vanguard Project and an Associate Professor in the Department of Surgery and in the Diabetes Centre at UNIGE Faculty of Medicine.

High resolution pictures

The Innovation Radar categorised these advances as “market-ready” or “business-ready”. Their listing on the dedicated EU platform increases visibility to partners and investors and provides access to support services such as the Horizon Results Booster.

“The science is moving and the foundation is built; now it’s about navigating the path to patients — and not losing time. By combining a protective biomaterial with pre-vascularised cell clusters, we’ve shown that donor-independent, immune-protected therapies are within reach. I am grateful to our exceptional team and partners. We are even more focused on what comes next”, says Prof. Berishvili.

The project also generated resources to support ethical and responsible translation: training materials, a patient-facing website, regulatory guidance for early-phase trials and a policy brief advocating harmonised regulations governing innovative products based on genes, cells or tissues (ATMP EU regulations) and equitable access to future therapies.

“Breakthroughs must be accessible — not exclusive. In 1921, Banting and Best discovered insulin in a modest Toronto lab, driven by urgency, not bureaucracy. Banting said, ‘Insulin belongs to the world.’ Today our science is stronger, but our hesitation is greater. With collaboration and determination, we can move innovations from bench to bedside,” concludes Prof. Berishvili.

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement no. 874700.

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**Funded by
the European Union**