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# A smart microfactory to accelerate personalized cancer treatments

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**Health | Pharmacology**



The Innosuisse ORION project brings together 24 partners with their headquarters or a branch in Switzerland. © zvg

**The microfactory developed by Haute Ecole Arc Ingénierie has inspired ORION, a new research project bringing together around twenty partners around personalized cancer treatments including the University of Bern.**

ORION is one of four projects selected by the Swiss Federal Innovation Agency Innosuisse as part of its flagship initiative, "Artificial Intelligence in the Life Sciences, from a Human Health Perspective." With a budget of nearly 13 million Swiss francs, this project will run from November 2025 to November 2029.

# Creating tumor models specific to each patient

The goal of the ORION project is to help improve the treatment of each cancer patient. To this end, researchers create copies of the patient's tumor in the laboratory. These "minitumors" allow researchers to test different treatments, making it easier to find the one that works best for everyone; they also help researchers develop new cancer drugs.

*"These minitumors, also called tumor organoids, are transforming our understanding and treatment of cancer,"* explains Dr. Marianna Kruithof-de Julio, Professor at the University of Bern. *"Our translational organoid resource core research center plays a central role in this project, providing the expertise and infrastructure necessary to create clinically relevant organoid models that drive therapeutic innovation in oncology. However, designing patient-specific tumor models that reproduce the complexity of real tissues remains a challenge."*

## Thanks to a smart microfactory from the MicroLean Lab

The ORION microfactory is an evolution of the microfactory developed within the MicroLean Lab at HE-Arc Ingénierie. This laboratory creates small, autonomous factories, controlled by artificial intelligence, capable of manufacturing various products, correcting and improving themselves. This microfactory concept had already inspired Dr. Jérôme Charmet, professor of biomedical engineering at HE-Arc Ingénierie, to create a version capable of storing data in synthetic DNA (European project DNAMIC in 2023).

*"After six years of developing autonomous microfactories in the watchmaking industry within the MicroLean Lab, the ORION project is transferring this visionary concept to the BioMedTech industry,"* explains Dr. Nabil Ouerhani, Deputy Director of HE-Arc Ingénierie, Head of R&D and Continuing Education. *"Our teams in La Chaux-de-Fonds and Saint-Imier are joining forces with a consortium of 23 partners to advance research on personalized cancer treatments."*

*"Patient-derived minitumors offer great hope for accelerating personalized cancer treatments. However, it is still difficult to reproduce them faithfully to the original tumor,"* adds Jérôme Charmet, head of the ORION project. *"Our microfactory will make this process faster and more reliable, while also allowing us to test numerous therapies, thus advancing personalized oncology."*

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