ITQB NOVA leads the creation of a European Hub for research in chronic diseases and human host-microbial interactions

The twinning project aims to develop organ-on-chip technologies to tackle some of Europe's most pressing health challenges

Oeiras, 01 October 2024 – An international team led by Sarela Santamarina, from Instituto de Tecnologia Química e Biológica António Xavier of Universidade NOVA de Lisboa (ITQB NOVA), in collaboration with Cláudia Santos from NOVA Medical School, just received 1.5M€ in funding from Horizon Europe to study chronic diseases and host-microbe interactions using innovative methodologies more relevant to human biology, such as organ-on-a chip devices.

Chronic diseases are responsible for 86% of all premature deaths and are a significant cause of morbidity in Europe. On the other hand, around 8.9 million infections occur annually within European healthcare settings, resulting in 33 thousand deaths due to antibiotic-resistant bacteria. Advancing research with human-relevant technologies is essential to develop effective treatments and reduce the impact of these health challenges.

This innovative project, called "MPS NOVA Hub: Advanced Microphysiological Systems and Pluripotent Stem Cell Technologies to Unveil Chronic Disease Mechanisms and Host-Microbe Interactions", aims to establish a European Hub of Excellence to translate basic research in chronic diseases, infectious diseases, and beneficial host-microbe relationships into clinical applications. For that, the research team will be developing and integrating miniature organ constructs and stem cells into "organ-on-chip" platforms. Organ-on-a-chip are small devices that simulate the environment and behavior of specific organs, like the heart, liver, or lungs, both healthy and diseased. By combining multiple devices of this kind, scientists can even create a "multi-organ-on-a-chip" system to study functional changes, interactions, and communication between different organs.

"These *in vitro* platforms, collectively known as microphysiological systems (MPS), and stem cells research hold great promise for advancing our understanding of human biology in health and disease", explains the researcher Sarela Santamarina. Because these are developed using human cells, they could be used to select therapies customized for individual patients, representing a significant advancement in personalized medicine. "Plus, they are a great alternative to animal models", she adds. "With the resources that this project brings, and the research community's interest in adopting these methodologies, Portugal has a significant opportunity to be at the forefront of new developments in this area", adds the researcher Cláudia Santos, from NOVA Medical School.

Coordinated by ITQB NOVA, in collaboration with NOVA Medical School, the twinning project brings together 19 research groups from Universidade NOVA de Lisboa, which will be using these technologies to study ageing, neurodegeneration, inflammation, infection, microbial symbiosis, therapeutics development, and others. The project will also establish a collaborative network with internationally renowned experts in the fields of MPS and stem cells from Universitaetsklinikum Jena (UKJ), the Berlin Institute for Medical Systems Biology (MDC-BIMSB), in Germany, and the Fondazione Human Technopole (FHT), in Italy.

"Projects of this nature foster a rich exchange of scientific and technological expertise. We are very proud to lead this initiative with the potential to develop valuable models for improving human health", says João Crespo, ITQB NOVA Dean.

More information

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