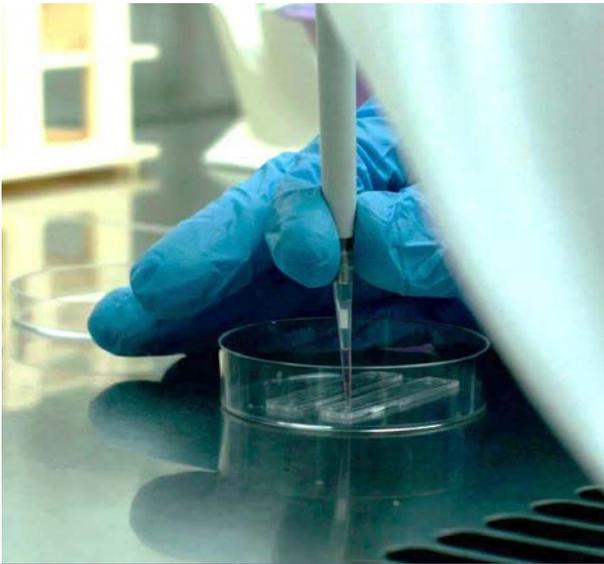
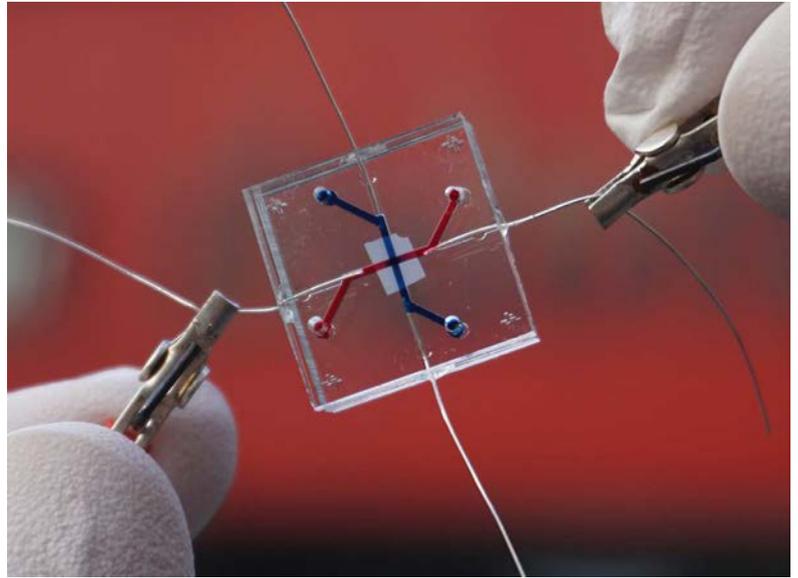


ORCHID

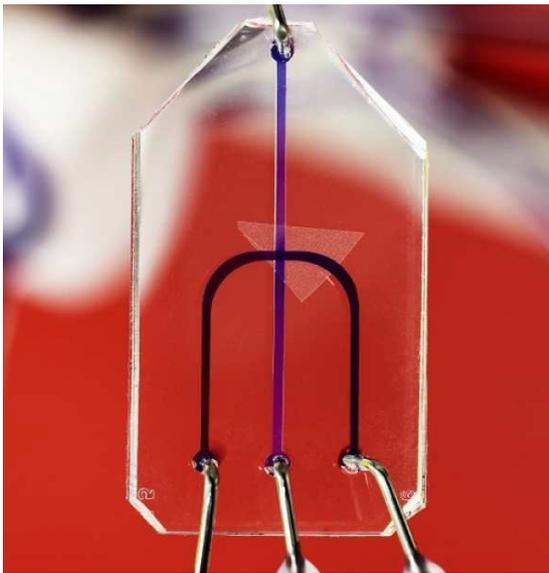


ORGAN ON CHIP IN DEVELOPMENT

The ORCHID project (Organ-on-Chip development) is an EU initiative, coordinated by Leiden University Medical Center and the Dutch Organ-on-Chip consortium hDMT in The Netherlands. The main goal of ORCHID is to create a roadmap for organ-on-chip technology and to build a network of all relevant stakeholders in this promising innovative field. In the ORCHID project that started on 1 October 2017 in total seven leading European research institutions are involved.

What is the Organ on Chip Technology?

An organ-on-a-chip (OOC) is a microfluidic cell culture chip capable to resemble partial or totally the pathophysiological behaviour of entire organs or tissues. To achieve this goal, it is not only needed to place the different cell types in their proper location but also to mimic the chemical and mechanical stimuli inside the microfluidic chip. Fabrication technologies (Microfabrication, microelectronics and microfluidics) combined with advanced cell culture techniques will provide novel physiological and sophisticated in vitro models closer to the in vivo organ functions.



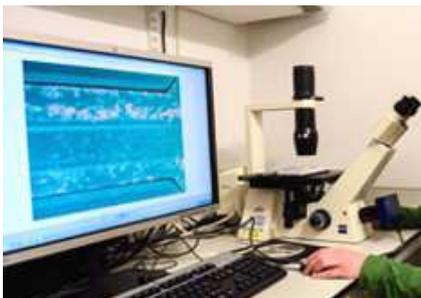
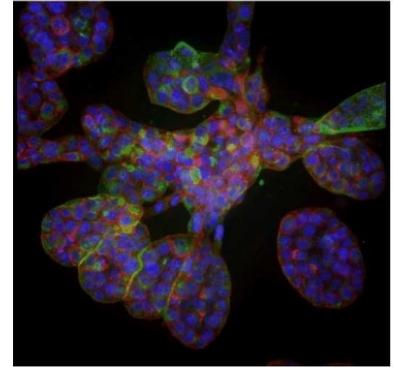
Organs-on-chips will radically change the way and the speed at which drugs can be implemented clinically, not only for general drug development but also for personalised drugs. This is not only key for making drug and cosmetic development test-animal free, but the accuracy and speed with which outcomes can be evaluated will surpass standard cell cultures and laboratory animals that presently capture human physiology and response on drugs imperfectly. Organ-on-chip technology is cutting-edge science, which goes beyond the frontiers of knowledge and requires multidisciplinary collaboration. hDMT, one of the partners of this consortium, has submitted a FET Flagship proposal for this technology with a broad support from European research centres and is actively

working with other regenerative medicine proposals to settle a broad EU flagship. Partners are European leaders in their specialist area but their collaboration is essential to realize the potential of this emerging technology.

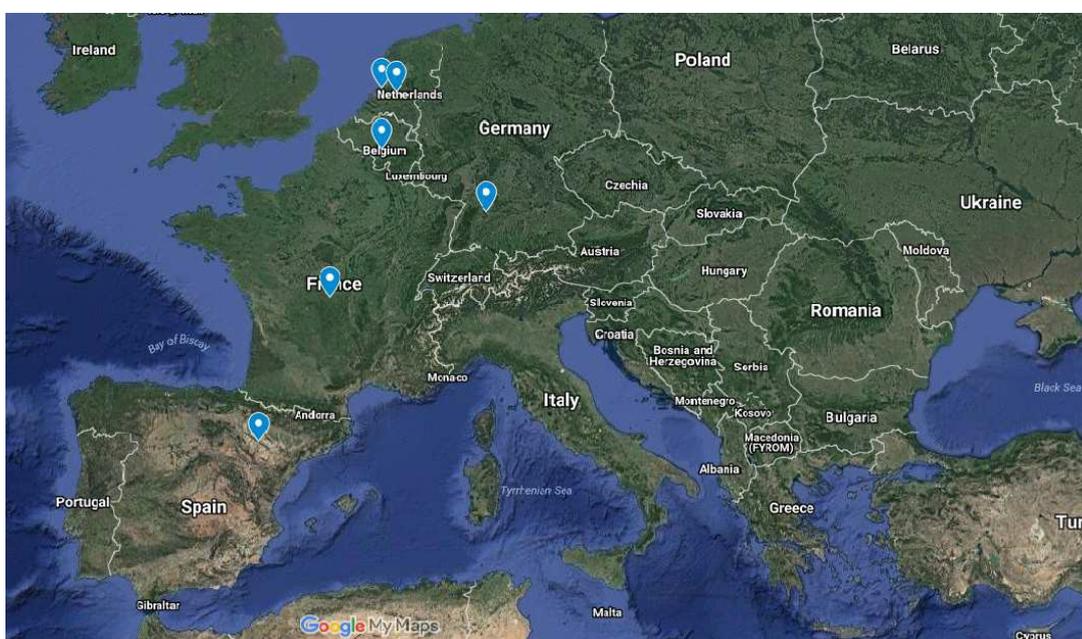


Summary

Organ-on-chip technology will revolutionize the healthcare domain by offering new and ground-breaking solutions to different industries and especially for regenerative medicine and medication. Organ-on-Chip In Development (ORCHID) will create a roadmap for organ-on-chip technology and the framework to build a network of relevant stakeholders. ORCHID will achieve this through 5 objectives: (i) evaluation of the technology (state of the art and unmet needs), (ii) identification of ethical issues, establishing standards and identifying measures for regulatory implementation, (iii) analysis of economic and societal impact, training and education, (iv) developing a roadmap which will guide the required R&D efforts and (v) raising awareness and building the ecosystem for organ-on-chip technology through a digital reference platform. ORCHID will have a broad impact: it will facilitate drug development, contribute significantly to reducing animal experiments and help in developing personalized medicine. ORCHID will achieve these goals by providing a framework to the main stakeholders, bringing together key players and raising



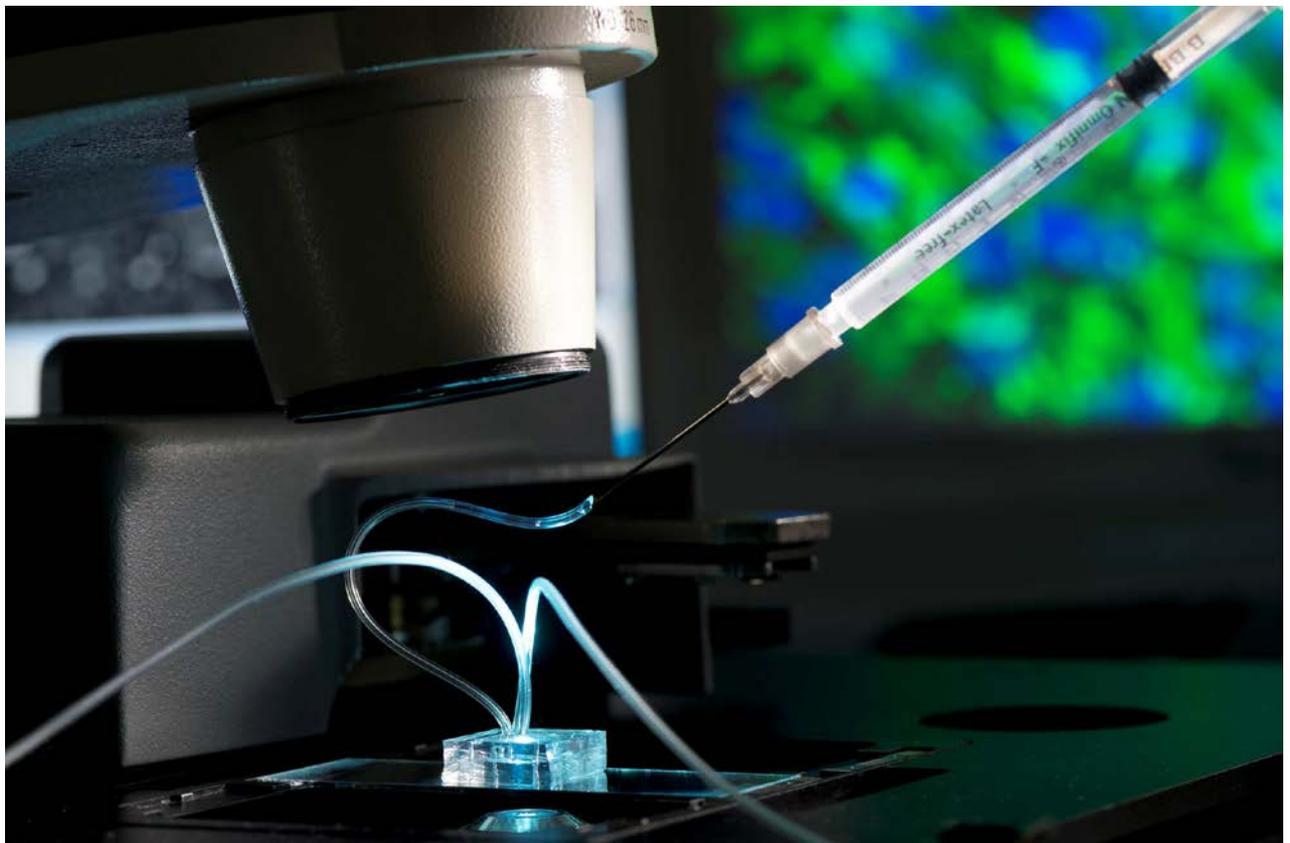
awareness on organ-on-chip technology throughout Europe. The digital platform will gather all information on existing and new initiatives in the field. In this way ORCHID as a whole will secure and reinforce Europe's leadership on organ-on-chip. The consortium is composed of the main contributors to the field who are all very experienced and who will strongly collaborate with each other. Leiden University Medical Centrum (LUMC) will lead the consortium (Prof. dr. Christine Mummery is the Project Leader), the Institute for human Organ and Disease model (hDMT) and Delft University of Technology (TUD) will focus on the strategy and the roadmap, Fraunhofer IGB on impact assessment, CEA Leti on eco-system development and the digital platform, IMEC on the ethical aspects, regulation and standardization and the University of Zaragoza will lead dissemination. ORCHID will install an Advisory Board composed of complementary specialists in the field.



Objectives

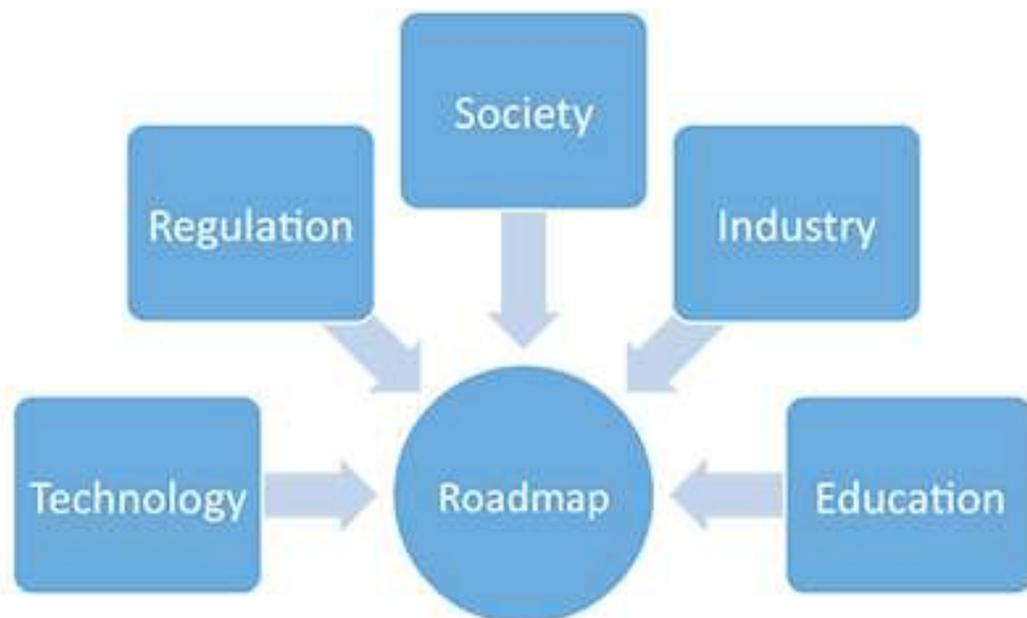
The main goal of this project is to create a roadmap for organ-on-chip technology and to build a network of academia, research institutes, industry, and regulatory bodies to move organ-on-chip technology from promise in the laboratory into reality for the citizens of the Europe and the rest of the world.

- 1: Assess the status of organ-on-chip technology in Europe
- 2: Identify ethical issues, drive standardization and take steps for regulatory take-off
- 3: Analyze the impact on economy, society, training and education
- 4: Establish the organ-on-chip technology roadmap
- 5: Raise awareness and build the ecosystem for organ-on-chip technology



Indicators

- The roadmap for organ-on-chip technology and its applications, based on the development status and the impact: technology v2.0, next areas to be explored, definition of the intermediate milestones and objectives, etc.
- Training, education and exchange research programs to promote the technology including relevant skills.
- Installation of a large international ORCHID advisory board to advise and raise awareness on the technology.
- Digital platform which will be the reference for all stakeholders.
- List of activities to raise awareness about organ-on-chip technology: events/workshops involving stakeholders, media publicity (social media/general media), publications. Recommendations to pave the way for innovation: facilitate market introduction, preparing the regulation and legislation for the organ-on-chip technology, solving ethical issues.



Partners

The consortium is composed by the following organizations:



LEIDEN UNIVERSITY MEDICAL CENTER



Universidad
Zaragoza



CONTACT:

WEB: www.h2020-orchid.eu

or

email: orchid@lumc.nl

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