



Factsheet

acronym	EMAPS-Cardio
full title	ElectroMechanoActive Polymer-based Scaffolds for Heart-on-Chip
programme	Horizon 2020
contract number	953138
abstract	<p>Cardiovascular diseases (CVDs) account for 45% of deaths in Europe and are estimated to cost the EU economy €210 billion a year. However, only four drugs targeting cardiovascular diseases have been approved for use in the last decade. Thus, models that could effectively simulate diseased tissues, would enable the accurate assessment of the efficacy of the pharmaceuticals, and would accelerate drug development are urgently needed. The main bottleneck towards such models is the foetal-like state of the human induced pluripotent stem cell (hiPSC) derived cardiomyocytes (CMs). That is hiPSC-CMs do not reach adult-like maturity. The objective of this project is to produce a platform for growth and maturation of cardiac microtissues for adult-like organotypic models in healthy and diseased states. To achieve that, biomimetic microenvironment that provides all the needed stimuli (electrical, mechanical, topological (3D environment) and biochemical (release of active molecules)), during the maturation of hiPSC-CMs will be developed. This will be achieved by combining electro-mechanoactive polymer-based scaffolds (EMAPS) with bioactive membranes. To characterize the effects of CVD drugs, the contractility of the microtissue will be monitored continuously and simultaneously (over 24-wells) using the sensors developed during the project. To increase the sensitivity and accuracy of the model, deep-learning based algorithms to detect the effects of drugs in vitro will be developed and verified. The goals will be achieved by a multidisciplinary consortium with complementary know-how of three academic units and seven small companies. The increased sensitivity and accuracy of organ-on-chip devices is a needed leap in technology that will accelerate new drug development without the need for animal models; the project aims to provide a platform for the realization of such physiologically-relevant organotypic models.</p>
duration	48 months (01/03/2021 – 28/02/2025)
project funding	5,355,921.25 €
coordinator	Dr Christian Bergaud Centre National de la Recherche Scientifique (CNRS) Paris, France Email: bergaud@laas.fr



EMAPS



partners

- BIOFABICS LDA, Portugal
- BioTalentum Ltd., Hungary
- CNRS – Centre National de la Recherche Scientifique, France
- CSEM – Centre Suisse d'Electronique et de Microtechnique SA, Switzerland
- Eurecat Technology Centre, Spain
- Eurice – European Research and Project Office GmbH, Germany
- InoCure s.r.o., Czech Republic
- OSPIN GmbH, Germany
- VMTI Center for Innovative Medicine, Lithuania

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