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PANBioRA: First steps towards an integrated biomaterial risk assessment testing system

PANBioRA is a four-year “Research and Innovation Action” funded by the European Union’s Horizon 2020 programme aiming to develop a modular system using cross-disciplinary techniques that will predict the patient-specific response to a given biomaterial and methods for analysing novel biomaterials. After the first six months important advances in different aspects of the system have been reached in the project. Such as the development of a mini-microscope, several in silico systems for investigating biomaterial/cell interactions or new biosensors

From 9th to 10th July 2018 all PANBioRA partners met in order to discuss the current state of the project’s development and to agree upon the plan of action for the next 6 months. The meeting was organised and hosted by project partner “Steinbeis Advanced Risk Technologies Institute doo Kragujevac” and took place in Belgrade, Serbia.

The PANBioRA consortium aims to develop a testing system integrating different technologies into a single instrument that will be able to perform multiple analyses on cell and micro-tissue levels. PANBioRA’s testing system will provide an improved, faster and cheaper assessment of biomaterials. Better clinical outcomes for implants as well as savings in healthcare costs are potential impacts of the novel PANBioRA system.

The scientific coordinator Dr. Nihal Engin Vrana from Protip Medical is excited about the work performed during the first six months of the project. “We have already reached significant advances in different aspects of the system, such as the testing of several in silico systems for investigating biomaterial/macrophage interactions or the development of a first demonstrator of the mini-microscope.” Integrating mini-microscopes into the system allows live stream data acquisition of the different testing methods. The microscope, developed by the department of Computer Engineering at “TOE EPOKA University” allows magnifications from 7x to 70x and real time monitoring of cellular behaviour and cell viability.

The hosting partner “Steinbeis Advanced Risk Technologies Institute doo Kragujevac” is responsible for the multi-scale modelling part applied to biomaterials. With multiscale modelling, aspects of risks being difficult to assess experimentally can be simulated allowing a comprehensive biomaterial risk assessment. Above that, these simulations can lead to a reduction of animal testing and clinical trials. One of the models developed during the first project months focused on epithelial cells behaviour for assessing the effect of biomaterials on barrier forming tissues and another one on macrophage attachment on to the biomaterials.





In the following 6 months, the work in the project will concentrate on the design of the initial integrated systems particularly the automated cytotoxicity test and connected organ-on-a-chip system. These are important steps towards reaching the final goal of developing a system integrating testing methods on nano-, micro- and miliscale level. Potentially, it will be possible to test first clinical samples with Mimotope Variance Analysis (MVA) which is a propriety technology of “Protobios” as authorization for the clinical trial part of the project has already been obtained by “Centre Hospitalier Universitaire de Liège”. Above that, a stakeholder community will be built under the coordination of “Steinbeis Advanced Risk Technologies GmbH” in Stuttgart with the aim to identify and evaluate needs and expectations with respect to the development of a risk governance framework for biomaterials which will result in the PANBioRA Risk Radar at the end of the project.

For further information please visit www.panbiora.eu or follow PANBioRA on [Facebook](#), [LinkedIn](#) and [Twitter](#).

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PANBioRA is coordinated by Steinbeis 2i GmbH in cooperation with 16 partners: Protip Medical (Scientific Coordinator), Dolmen Design and Innovation Limited, Biodevice Systems, Protobios, Elvsys SAS, Steinbeis Advanced Risk Technologies Institute doo Kragujevac, Steinbeis Advanced Risk Technologies GmbH, Commissariat A L’Energie Atomique Et Aux Energies Alternatives, Pro-active, Aalto-Korkeakouluosaatio, Turgut Ozal Education SHA, The University of Nottingham, Agencia Estatal Consejo Superior de Investigaciones Científicas, Dublin City University, Institut National de la Santé et de la Recherche Medicale, Centre Hospitalier Universitaire de Liège

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