Project Research Infrastructure Cell Technologies in Biomedicine /INFRAACT/ of the National Roadmap for Research Infrastructure 2017-2023

The project Research Infrastructure Cell Technologies in Biomedicine /INFRAACT/ of the National Roadmap for Research Infrastructure 2017-2023 (NRRI 2017-2023) http://horizon2020.mon.bg/?go=page&pageId=46 received funding for a first technical phase in September 2018 after signed agreement with the Ministry of Education and Science.

NRRI 2017-2023 was adopted by decision No 354 of 29.06.2017 of the Council of Ministers and includes 23 scientific infrastructure complexes in different sectors of knowledge and with various degrees of development, among them INFRAACT.

The Research Infrastructure Cell Technologies in Biomedicine is represented by a consortium based on a public-private partnership established in 2013 - Alliance for Cell Technologies (ACT), in which teams of Sofia University "St. Kliment Ohridski "and institutes of the Bulgarian Academy of Sciences, non-governmental organizations and private clinics in the field of new cell biotechnology and assisted reproduction share and complement common human resources, facilities and educational activities. The coordinator is Sofia University, and the headquarters is at the Faculty of Biology, Department of Cytology, Histology and Embryology, co-founder of the Infrastructure.

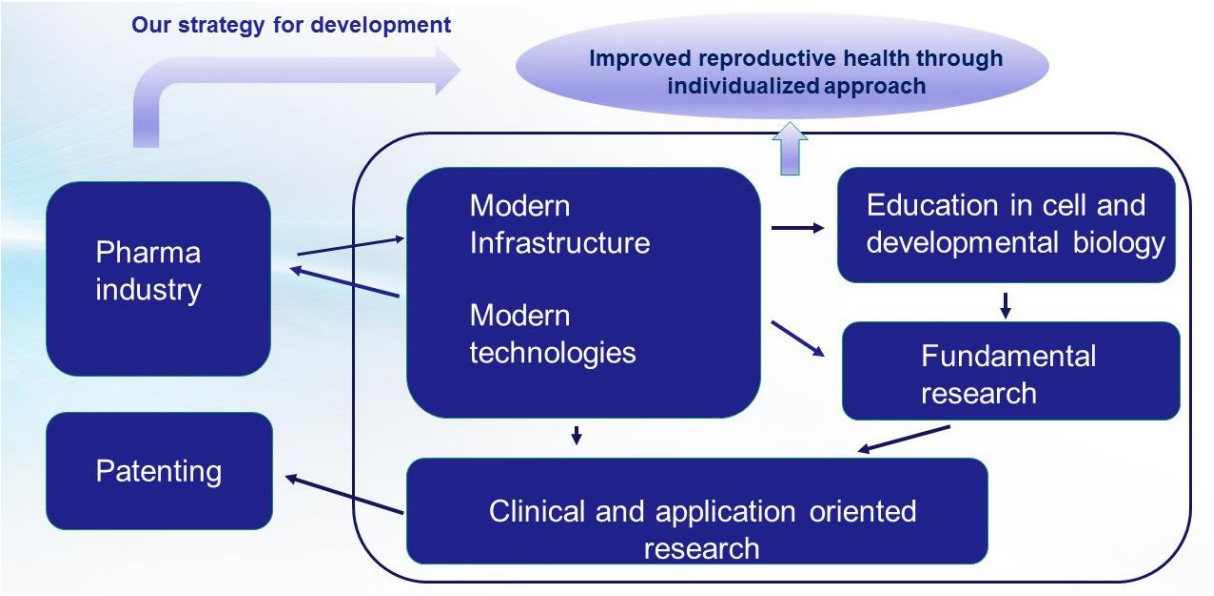
Financial coordinator is the Ministry of Education and Science.

The parties in the consortium are committed to R&T Development for overcoming DEMOGRAPHIC CHALLENGES TARGETING IMPROVEMENT OF REPRODUCTIVE HEALTH AND CONTRIBUTING TO PREVENTION OF AGING THROUGH INDIVIDUALIZED CELL-BIOLOGICAL AND MEDICAL APPROACH.

INFRAACT will address the needs of the biomedical community to: 1/ establish standardized stem cell based cell products to overcome severe reproductive disorders and restore reproductive functions; 2/ develop new methods for assessing and improving the quality of reproductive cells and embryos through the use of non-invasive approaches to increase the success of assisted reproduction; 3/ develop innovative technologies for cell therapy and personalized medicine, including work with embryonic and adult pluripotent cells and training of specialists in this area and others.

The Project is funded by Ministry of Education and Science Grant ДО1-154/28.08.2018/ „Research Infrastructure Cell Technologies in Biomedicine“ of the National Roadmap for Research Infrastructures 2017-2023

It is envisaged that the infrastructure will be serviced by five technology platforms built up by complementary units in the individual partners, aiming to maximize its operational effectiveness from multidisciplinary experience and existing resources of specialists, equipment and technologies. The platforms will develop an access plan for scientific and educational purposes, as well as for providing specialized business services for the benefit of the economy in order to improve the health of society.



INFRAACT aims to create a next-generation research-development track to serve science, diagnostics and therapy needs by enabling the following activities:

-production, in vitro analysis and cryopreservation of reproductive cells (gametes), reprogrammed and stem cells, tissues and other biological objects;

-analysis of single and rare specific cell populations, organelles and nanostructures;

-analysis of the whole genome, whole or target transcriptome;

-metabolic profile (metabolome) analysis for non-invasive follow-up and research of embryonic development for experimental and clinical purposes;

-proteomic studies in embryos, gametes and reproductive tissue to determine the complete profile of functional proteins associated embryonic development, reprogrammed and stem cells;

-lipid profile (lipidome) analysis of biological membranes of reprogrammed, embryonic, stem cells and gametes, research of ligands and plasma membrane receptor molecules;

-gene editing for experimental and therapeutic purposes.

The support for INFRAACT will be implemented in three phases according to stipulated NRRI funding mechanisms. Funding for synchronization phase for the first 12 month period is 454 083 BGN.

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The expected benefits from the infrastructure operation include intensification of innovation and knowledge transfer, generation of critical mass of highly qualified staff and the provision of high-quality biomedical services in the field of cell biotechnology and personalized medicine. Users of INFRAACT will be able to develop and employ the gained knowledge in creating new cell-based products for translational medicine, biotechnology processes, biomedical applications, materials or services in the field of reproductive and regenerative medicine.

INFRAACT recognizes as a first-line priority the establishment of working relationships with Members of the European Platform of Research Infrastructures in order to increase the research and technological development capacity and facilitate the creation of a skilled young Bulgarian generation of professionals in the desired area. According to the evaluation of international and national expert panels in March-April 2014, Alliance for Cell technologies-ACT has been recognized as a "potential Bulgarian research infrastructure node specializing translational research in the field of cell technologies". Contacts with the European infrastructure for translational medicine (EATRIS-ERIC), member of ESFRI have started in 2015 and the process of affiliation of Bulgaria was supported and coordinated by INFRAACT.

Participants in the project

Beneficiaries:

1. Sofia University "St. Kliment Ohridski" – Coordinator https://www.uni-sofia.bg/index.php/eng

Sofia University "St. Kl. Ohridski "is the most prestigious and oldest university in Bulgaria. Its mission is to create and disseminate knowledge at high level of excellence through education and research in all fields of science.

2. Institute of Biology and Immunology of Reproduction – Bulgarian Academy of Sciences http://ibir.bas.bg/en

Leading Institute in the field of Reproductive immunology and biology of development FUNDAMENTAL RESEARCH and applied research focus on cellular and molecular mechanisms of biological recognition and immunomodulation, factors and immune mechanisms of regulation of the reproductive process. Research facilities of the Institute include all needed equipment for performing and investigating conventional biochemical and molecular biology techniques, cell culture and production of hybridomas (including confocal microscopy), proteomic workflow facilities, facilities for deep freezing (programmed and conventional freezing) cryopreservation, cryobank of freezed cells and tissues.

3. Institute of Biophysics and Biomedical Engineering – Bulgarian Academy of Sciences http://biomed.bas.bg/en/

IBPhBME is the leading Bulgarian research institute in the fundamental sciences of biophysics, biochemistry, cell biology and physiology. The Institute is in the front line of biomedical technologies R&D in the fields of electrophysiology, mechanics of movement, information technologies and bioactive compounds. The Institute successfully conducts technology transfer

to other institutes of the Bulgarian Academy of Sciences, as well as universities, healthcare clinics and companies. IBPhBME is fully competitive and globally distinguished, and the achievements of its research staff have gained international recognition for their excellence.

Associated parties:

Joint Genomic Center Ltd http://www.jgc-bg.org/

The Joint Genome Center at Sofia University houses high-tech new generation equipment for conducting specific molecular biology and -omics research.

Medical Center "ReproBioMed" Ltd Sofia http://reprobiomed.eu

Medical Center ReproBioMed Ltd. implements a wide range of clinical and non-clinical research activities in the field of reproductive assisted technologies and human genetics.

In vitro Medical Center "Dimitrov" Ltd Sofia http://www.invitro.bg/en/

IVF Center Dimitrov Ltd. is Ob. & Gyn. private clinic equipped for all basic applications of in-vitro fertilization technologies and cryopreservation of stem cells, reproductive cells and tissues.

Bulgarian Society for Regenerative Medicine (BSRM) www.regenerativemedicine.bg

Bulgarian Society for Regenerative Medicine is a non-governmental professional association focused on specialized training and consultancy in the field of cell therapy and regenerative medicine.

Bulgarian Association for Reproductive Human Embryology (BARHE)

Bulgarian Society of Reproductive Human Embryology is a non-governmental professional association, publisher of the indexed journal "Embryology" since 2006. Together with other professional NGOs it is the initiator and organizer of a number of national conferences and training workshops.

Institute for Regenerative Medicine Ltd https://public.brra.bg/

Institute for Regenerative Medicine Ltd is a trade company focused on the commercialization of scientific products, organization of conferences and dissemination events, entrepreneurship and consultancy.

Association "ACT-Alliance for Cell Technologies" – Scientific Coordinator & TTO

Non-for profit legal entity to promote biomedical stem cell research and innovation.

Web site: www.alliancecelltechnologies.eu

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