



A European project to build a research infrastructure for access to patient-derived cancer models and data towards advances in translational oncology

Brno, Czech Republic – 17 July 2018

The EurOPDX Consortium, a network of translational and clinical researchers working with clinically-relevant models of human cancer known as patient-derived xenografts (PDX), is teaming up with other key academic and SME partners in a four-year project funded by the European Union. The project will create a public repository holding more than 1500 established PDX models for over 30 different cancer types, and provide access to these models for the scientific community. In addition, we announce that the first call for proposals for access to models will be launched in October 2018.

Under the coordination of the University of Turin in Italy, members of the EurOPDX Consortium and additional key European academic and SME partners recently secured 5 million € from the European Union's Horizon 2020 research and innovation programme to build an infrastructure for access to patient-derived cancer xenograft (PDX) models and related data, for academic and industrial, preclinical and translational cancer research.

The EurOPDX Consortium

EurOPDX
Translating Knowledge in Oncology

Counteracting high failure rates in the development of new treatment strategies in oncology and improving therapeutic management of cancer patients

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requires preclinical models that can account for the complexity and heterogeneity of human tumours. PDX models, which **maintain histopathological features and genetic profiles of the original patient tumours**, are increasingly recognised as reliable research models to predict treatment efficacy and discover biomarkers.

Numerous small- to mid-scale collections of PDX models for various cancer types have been established by academic laboratories across Europe, which are currently poorly visible and only exchanged on a discrete collaborative basis. This presents a bottle-neck to the use of these valuable resources and results in unnecessary redundancy of PDX models, which are time-consuming and expensive to establish and characterise. In addition, each research group develops its own methodologies, with few comparative studies being conducted. The EurOPDX Consortium was established 5 years ago as an initiative toward the integration of a number of PDX collections, and has been leading the way in raising standards and promoting scientific collaboration in PDX research in Europe (www.europdx.eu).

Towards the EurOPDX Research Infrastructure

This newly funded project named EDIREX (“EurOPDX Distributed Infrastructure for Research on patient-derived cancer Xenografts”), involves 19 partners from 13 European countries and aims to further the reach of the EurOPDX Consortium by offering free-of-charge access to a large PDX resource for academic and industry researchers in Europe and Worldwide. Such a resource is currently lacking in Europe and is much-needed to increase the predictability of preclinical data through the use of more reliable cancer models.

Under the leadership of two major IT partners (Masaryk University and EMBL-EBI), a public repository will be developed integrating a shared collection of over 1500 established PDX models with their clinical, molecular and pharmacological annotation, to facilitate data sharing and selection of models of interest by users. Data will be accessible in particular through the recently launched PDX Finder, a catalogue of PDXs co-developed by the EMBL-EBI and The Jackson Laboratory (www.pdxfinder.org). The EurOPDX repository will also include an innovative tool for improvement of the user experience with 3D visualisation of data, developed by the Italian SME Kairos3D. Access to models will be offered through six state-of-the-art partner facilities or “nodes” in the following institutions: University of Turin (Italy), Katholieke Universiteit Leuven (Belgium), Netherlands Cancer Institute (The Netherlands), University of Cambridge (UK), Institut Curie (France), and Vall d’Hebron Institute of Oncology (Spain). The provision of access will require the “nodes” and the other PDX providers to work toward standardisation and optimisation of biobanking, quality control and data tracking, and the performance of in vivo drug efficacy experiments. We aim to further support the deployment of global and sustainable standards thanks to the pre-existing links between project partners and other related international initiatives.

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In addition, the European infrastructure BBMRI-ERIC will bring its expertise in quality management and ethics, and will provide valuable strategic input for the sustainability of the infrastructure.

“Our work on the definition of standards in the field will not only be crucial for the establishment of the infrastructure distributed across 6 nodes, but will also improve the quality and reproducibility of oncology preclinical data on a global scale”, further emphasizes Prof. Enzo Medico, Coordinator of EDIREX (University of Turin, Candiolo Cancer Center IRCCS, Italy). “In addition, we will perform a large comparative study of the standard subcutaneous PDX models with more innovative models (including ex vivo tests performed by the Dutch Contract Research Organisation, Ocello), combined with advanced preclinical imaging, to prepare for future services of the infrastructure and improve its contribution to innovation in cancer research.”

As mentioned above, Masaryk University (MU) will co-lead the project work package WP1 targeted to Informatics: Developing a public repository for EurOPDX models.

The starting point of this infrastructure will be several instances (one per EDIREX node) of the LAS system (developed by UNITO). Currently, those are expected to be hosted mostly at MU as well as the developed EurOPDX repository, a central component of the infrastructure. The data gathered from the LAS systems will be harmonized according to a common information schema agreed across all consortium partners, and they will be uploaded to the repository automatically. For other laboratories, without the LAS system, there will be an option to upload the data through online forms. MU will provide a user support for the LAS users and storage capacities for EurOPDX data during the project lasting.

Search and visualization tools such as cBioPortal, GenomeCruzer or PDX Finder will be integrated on the top of the repository, forming together the EuroPDX Data Portal foreseen in the project proposal. Specifically, cBioPortal will be maintained by MU with the support of its developers from MSKCC. The user will experience the integration of those tools, leveraging their specific functionalities while working with the same dataset.

An important part of the infrastructure will be setting up of an access policy to EurOPDX data. Several different degrees of data protection are foreseen corresponding to different users, e.g. the general public, bona-fide researchers in the field, or specific project members. The setup will follow the best practices of established European infrastructures such as EGI, Elixir, and BBMRI in which is MU participating as well.

Modalities of access & Announcement of the first call for proposals in October 2018

Access to the PDX resource will be offered through a grant application system which will open in October 2018. The grant will offer successful applicants the opportunity to receive tissue

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samples from PDX models listed in the newly developed EurOPDX repository, or deposit one of their own models at one of the six “nodes”, for inclusion in the public repository, allowing access to their resource by the wider scientific community. As from the 2nd call (planned in 2019), the nodes will also perform in vivo drug efficacy studies for selected users, and in particular oncology biotechnology companies.

The EDIReX webpage, launched this week (<http://europdx.eu/europdx-research-infrastructure/europdx-research-infrastructure-about>) provides further details of the objectives of the project and centralises information on the established standards, the opportunities for access and the modalities of applications.

Masaryk University, established in 1919, is the second largest Czech university with around 36,000 students and 4,500 staff in 9 faculties and 2 university Institutes. Masaryk University is involved in several biomedical research infrastructures, as a partner or as a national leading institution.

Institute of Computer Science, one of the university Institutes, with its staff of around 140 persons, is a leading national institute in the area of e-infrastructures and cybersecurity. It hosts national research infrastructure CERIT-SC (CERIT Scientific Cloud) and the Czech Cybercrime Centre of Excellence (C4E) and recently is taking national leadership and coordination in the GDPR implementation for the university/academic environment in the Czech Republic.

EDIReX project partners:

- Universita degli studi di Torino, Italy (COORDINATOR)
- Katholieke Universiteit Leuven, Belgium
- The University of Cambridge, UK
- Institut Curie, Paris, France
- Vall d'Hebron Institute of Oncology, Barcelona, Spain
- Stichting Het Netherlands Kanker Instituut-Antoni van Leeuwenhoek Ziekenhuis, Amsterdam, The Netherlands
- Masarykova Univerzita, Brno, Czech Republic
- European Molecular Biology Laboratory - European Bioinformatics Institute, Hinxton, UK Biobanks and BioMolecular Resources Research Infrastructure Consortium (BBMRI-ERIC), Graz, Austria
- Royal College of Surgeons in Ireland, Dublin, Ireland
- Institut Català d'Oncologia, Barcelona, Spain
- The University of Manchester, UK
- Academisch Ziekenhuis Groningen, The Netherlands

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- Oslo Universitetssykehus HF, Norway
- Istituto Europeo di Oncologia, Milan, Italy
- Hospital Universitario de Fuenlabrada, Madrid, Spain
- Kairos3D SRL, Turin, Italy
- Ocello BV, Leiden, The Netherlands
- seeding science, Limelette, Belgium

Funding:

EDIReX has received funding from the European Union's Horizon 2020 research and innovation programme, grant agreement no. #731105



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