Cancer treatment is continuously evolving with many potential medications being developed. However, clinical trials are costly, time-consuming, and expose patients to side effects. Without prior preclinical evaluation, the ethics, feasibility, and economics of conducting them would be questionable. Preclinical investigation of anti-tumor compounds on tumor models is an important step in the process of drug development. To obtain preclinical results with high predictive value for clinical trials, the choice of the preclinical tumor model(s) is a crucial point.

Human primary xenografts, directly obtained from patients ("Patient-Derived Xenograft" or PDX), constitute the main category of preclinical cancer models. They reproduce well the high heterogeneity of human cancers, procedures for assessment of therapeutic efficacy are well standardized for components used in monotherapies or in combination with standard treatment. The possibilities of ex vivo genetic or therapeutic manipulations before xenotransplantation are also important.

The research performed at the Laboratory of Preclinical Investigation is an important complement to the pharmaceutical development performed by pharmaceutical companies.

The platform is part of the Translational Research Department.

**Activity**

- Maintenance of around **300 PDX** (patient derived xenografts) panels
- **Preclinical experiments**: experiment design, in vivo grafting, treatments (monotherapies and combination), tumor follow-up, statistical analyses, tumors/organ collections, in vivo cell line injections, ...
- Study of **pharmacodynamic markers**
Objectives

- Development of panels (breast cancers, ovarian cancers, uveal melanoma, NSCLC)
- Development of new panels:
  - development of variants PDX (i.e. in man and in vivo resistant tumors, PDX obtained from bone metastases)
  - new tumor types (prostate cancer, chordoma, carcinoma of the anal canal)
  - new modelization (humanized PDX models, 3D-organoids models)
- Identify biological markers of response and resistance

Available PDX

About 300 models are currently available, including breast cancers, colon cancers, non-small-cell and small-cell lung cancers, glioblastomas, uveal melanomas, lymphomas, ovarian cancers, prostate cancers, retinoblastomas, and others

Networks

The platform is a member of the European EuroPDX consortium, which has the aim of sharing patient derived tumour xenografts for collaborative research projects and multicenter preclinical trials.

Contact

All requests and proposals are opened for discussion and optimization in order to reach requested objectives and raised issues:

- Didier Decaudin, MD, PhD, Head of the Laboratory of preclinical investigation
- Elisabetta Marangoni, PhD
Key publications

Year of publication 2020

(2020 Aug 15)

PLK1 inhibition exhibits strong anti-tumoral activity in CCND1-driven breast cancer metastases with acquired palbociclib resistance.
*Nature communications*: 4053 : DOI : 10.1038/s41467-020-17697-1


BRCAness, SLFN11, and RB1 loss predict response to topoisomerase I inhibitors in triple-negative breast cancers
*Science Translational Medicine*: DOI : 10.1126/scitranslmed.aax2625

Year of publication 2019


Protein arginine methyltransferase 5: A novel therapeutic target for triple-negative breast cancers.
*Cancer medicine*: 2414-2428 : DOI : 10.1002/cam4.2114