OmiCure is a digital health company focused on developing advanced therapeutic decision support systems in oncology. Using 'omics data and our advanced artificial intelligence technology, we transform the promises of AI and Big Data into the reality of identifying better treatments for cancer patients.

OmiCure has partnered with the Centre Léon Bérard (CLB) to bring patients the best possible care. CLB is one of the leading French Comprehensive Cancer Centres dedicated to excellent medical care, research and education and a member of the Federation of Cancer Centres (UNICANCER), OECI (Organisation of European Cancer Institutes)-certified. Ranked among the top 3 French cancer hospitals in terms of patient recruitment in clinical trials including CLB-sponsored ones, CLB is certified by the French National Cancer (INCa) for early phase clinical trials (CLIP2 center). CLB and its Molecular Tumor Board has a leading position and extensive experience in precision medicine by sponsoring large studies such as PROFILER (NCT01774409; > 4,000 patients included), PROFILER 02 (NCT03163732), MOST plus (NCT02029001) and more recently PLANET (NCT05099068) studies. Finally, CLB is labelled by INCa since 2011 as an Integrated Cancer Research Site (SIRIC LYriCAN) and is actively involved in translational research with > 500 researchers on-site and 3 research Units including the Cancer Research Centre of Lyon (CRCL, UMR Inserm 1052 – CNRS 5286 – Centre Léon Bérard).

We are looking for like-minded individuals who share our enthusiasm and passion for making precision medicine in oncology a reality for patients, and who want to join an OmiCure-CLB dynamic joint program based in Paris and/or Lyon.

Our goal is to attract enthusiastic, dynamic, autonomous, and organized PhD candidates, with a background in bioinformatics or computational biology, and with excellent communication skills, who seek to develop their doctoral thesis in an industrial and clinical environment, and who will thrive at the heart of technological innovation.

PhD project proposal:
Over the last decades, precision medicine has taken centre stage, especially in the field of oncology, where patients are increasingly matched to targeted therapies based on individual patient and tumour characteristics. The biggest advances have been achieved with investigation of DNA structural abnormalities. Unfortunately, not all tumours have pharmacologically tractable DNA alterations, and approximately only 40-50% of patients will have an actionable genomic alteration, and only 20% will be treated with a drug recommended by a Molecular Tumor Board. We believe that to address this gap and increase the number of patients that may benefit from targeted and immunotherapies we should use gene expression profiles (transcriptomics) data to define new biomarkers of response.

The WINTHER trial[2] has been one of the most recent clinical trials trying to evaluate the added value of transcriptomics when attempting to match patients to therapies. It was also the trial where we clinically tested our transcriptomics-based therapy decision-support prototype.

In collaboration with Pierre Saintigny's teams at CLB and CRCL, we are now seeking an enthusiastic PhD candidate to work with us, and to help us go one step further on patient care.

We're seeking a PhD candidate that is passionate and committed to break research barriers in the area of predictive biomarkers for cancer targeted therapies and immunotherapy, and in the area of blood-transcriptome as a source of cancer liquid biopsy biomarkers. The successful candidate will be asked to further test, benchmark and validate our current transcriptomics-based therapy decision-support algorithm, as well as, design and execute *in-silico* experiments that will allow us to answer the following research questions:

- can we find a better biomarker than PD-L1 protein expression to predict patients' response to immunotherapy?
- will this new biomarker be reproducible, reliable, and simple to implement in a clinical setting? and
- are we ready to use transcriptomics from blood to infer the tumour microenvironment, and predict immunotherapy responses.

The main goals of the project will thus be:

- Evaluate the clinical relevance of OmiCure AI-based technology by mining publicly-available as well as proprietary data from CLB and implement it in the context of clinical research
- Develop OmiCure's advanced therapeutic decision support system by incorporating features associated with response to immunotherapy
- Explore the potential value of blood-based transcriptomics to infer the tumour microenvironment in the context of rapid development of immune therapies

If you're seeking a CIFRE PhD project, and your goal is to become an agent of change in precision oncology, please come and talk to us!

Topic : Transcriptomics-based therapy decision-support systems in oncology
Type : CIFRE (Conventions Industrielles de Formation par la Recherche)
Duration : 3 years
Industry partner : OmiCure
Academic/Clinical partner : Centre Léon Bérard (CLB)
Doctoral school : ED 340 - BMIC Biologie Moléculaire Intégrative et Cellulaire
Location: Paris and/or Lyon
Aim of project: Improve and develop new transcriptomics-based therapy decision-support systems in oncology

References:

1. Lin, V. T. G. & Yang, E. S. The pros and cons of incorporating transcriptomics in the age of precision oncology. *J. Natl. Cancer Inst.* **111**, 1016–1022 (2019).
2. Rodon, J. *et al.* Genomic and transcriptomic profiling expands precision cancer medicine: the WINTHER trial. *Nat. Med.* **25**, 751–758 (2019).

For more information:

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