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The technological clusters of the Synergie Lyon Cancer Foundation

by Doctor Patrick Mehlen

Doctor Patrick Mehlen is a researcher at the Cancer Research Center of Lyon. He coordinates the "Dependence Receptors, Cancer and Development" research team, which seeks to "understand why cancer cells refuse to die". The goal of their research is wholly dedicated to re-triggering the death of cells that refuse to die in order to develop new therapeutic tools.

"The existence of the Synergie Lyon Cancer Foundation allows carrying out 2 missions.
The first is to give the excellence of research (fundamental and clinical) in Lyon greater visibility. To do this, one of the essential advantages of the Foundation is that it attracts high level researchers acknowledged for their originality to find new and original treatments.
The second mission consists in ensuring that there is no barrier in the continuum between fundamental and clinical research. Several barriers were identified when the project to launch the Foundation started. The Foundation overcame these obstacles by setting up three clusters, thereby offering Lyon the entire chain from fundamental research up to the treatment of patients.

The Bioinformatics Center was one of the three centers developed under the aegis of the Foundation.
The research paradigm in cancerology has undergone radical change in recent years.
It is now known that there are as many cancers as the individuals that have them. These cancers must be characterized, which is the objective of the bioinformatics center: we need to understand the mutations and alterations contained in patients' tumors. If we know these cancerous alterations, in time we will be able to offer adapted therapies.
The aim is, within 10 years, to be able to biopsy the tumor of each patient in care facilities in order to sequence their genome. So, from the information extracted, it will be possible to adapt the treatment to each patient.
To achieve this goal within 10 years in each care facility, it was necessary to set up the resources necessary in Lyon.
The bioinformatics center is the result of its instigator, Gilles Thomas, who set it up from scratch several years ago. It is now a national reference.

Our fundamental research has resulted in the identification of mechanisms that are the keys for understanding cancers. For example, it can be shown that a specific gene or protein is essential for the survival of a specific cancer. However, this does not turn the gene or protein into a drug that can be used to treat the patient.
The Drug Discovery and Development Center emerged from this awareness. This center uses our fundamental findings to develop drugs against proteins or pathways leading to the formation of the cancers concerned.
The objective of this center is to discover and create molecules called candidate drugs. In fact they are not exactly drugs, as the latter can be used to treat humans. They are promising compounds that could become drugs in several years, thereby acting to stimulate the interest of large pharmaceutical

companies. Aware that molecules are being developed and that the risk is taken by our center, they intervene at later stages in their development. It is they that will take the drugs through to clinical trials with patients. These trials will be performed by clinicians in Lyon.

The Foundation's 3rd facility, the Tumor Model Laboratory (LMT), was set up to meet the need for models in order to ensure continuity between fundamental research and the treatment of patients.
The Drug Discovery and Development Center and the many ideas that spring from our researchers will lead to candidate drugs. Although being able to count on these molecules is a step in the right direction, unfortunately, an idea sprung from the mind of a researcher cannot be applied directly to a patient. Models are required so that experiments can be performed with these candidate drugs.
The Tumor Model Laboratory develops models of lung cancer, pancreatic cancer and breast cancer, with specific mutations that are used to test the effect of the compounds developed by our teams at the Drug Discovery and Development Center. Thus their efficacy and toxicity can be tested on animals. This process increases the chances of obtaining an efficient treatment that has a greater effect when used in humans.
The facilities of the Synergie Lyon Cancer Foundation combine the competences and people highly specialized in their disciplines, capable of using highly specific models to satisfy a very wide range of problems.