An interview with Prof. François FUKS

Laboratory of Cancer Epigenetics, ULB-Cancer Research Center

What are the key figures for research at the Laboratory of Cancer Epigenetics?

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The Laboratory of Cancer Epigenetics was the first laboratory fully dedicated to epigenetics created in Belgium in 2006. Thanks to its twenty or so technicians, doctoral and post-doctoral fellows of many nationalities, the laboratory has published articles regularly in flagship journals such as Nature or Science and has received several national and international awards. In fact, it is recognised internationally as can be witnessed from its participation in several European framework programmes, its participation in or organisation of international congresses and indeed its numerous collaborations in Europe, the United States and China. Currently, the Laboratory of Cancer Epigenetics is leading about ten research projects.

What are the main lines of research at the Laboratory of Cancer Epigenetics?

Could you give us a few examples of research projects in progress?

The work of the Laboratory of Cancer Epigenetics centres on two main lines: fundamental research and translational research. In fundamental research, we studied the basic mechanisms of cancer epigenetics, that is the alterations of DNA and proteins. More recently, we have also been studying RNA epigenetics, which led to the publication of an article in Science and participation in a European project. Aside from that, we have a novel and ambitious study in oncology in progress: we are concentrating on the role of

RNA epigenetics in cancer and are seeking to demonstrate that the latter is linked to RNA epigenetic defects.

To make the link with translational research, the Laboratory of Cancer Epigenetics manages a high throughput sequencing platform dedicated to epigenomics in order to develop different technologies in this field.

As for the translational research, it targets diagnostic (new epigenetic markers for personalised oncology) and predictive applications. The sequencing facilitates the mapping of epigenetic defects of the DNA in breast cancer and determining if chemotherapy treatment will be successful or not. A patent has already been filed and our approach is used for clinical purposes in the context of “Treatbest”, a project certified by the competitiveness cluster BioWin and bringing together two Walloon companies, Diagenode and IDDI.

Which are the research partnerships you have developed with the pharmaceutical industry?

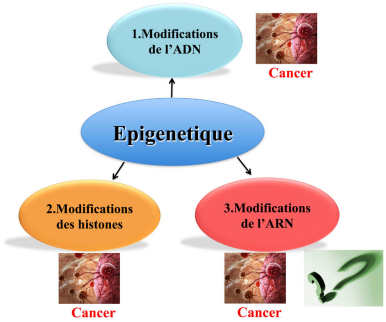
We have agreed partnerships with several firms such as Novartis, Promega and New England Biolabs (United States). In addition, in Spring 2018 I co-founded EPICS Therapeutics, a spin-off of ULB whose CEO is Jean Combalbert, former CEO of a company called Ogeda. EPICS Therapeutics uses our research on RNA epigenetics to develop new treatments against cancer, thanks to the discovery of new inhibitors.

In your opinion, what are the main challenges ahead for researchers on cancer epigenetics in the years to come?

Epigenetics is still a relatively recent discipline even if it is very in vogue and considered as important as genetics in terms of diagnostics and treatment. As of now the fundamental mechanisms of epigenetic deregulation at work in cancer have yet to be discovered: this is a priority of fundamental research. We also have to transfer this new knowledge to translational and clinical level, which is precisely the aim of EPICS Therapeutics.

Epigenetic therapy against cancer has given rise to great hope: it is now up to us make this hope a reality by developing more targeted drugs for personalised medicine. The challenge is also technological as we need to perfect the techniques of epigenetic sequencing for fundamental, translational and clinical research.

In summary, epigenetics is becoming indispensable for all major human diseases; besides cancer, altered epigenetic components can be found especially in type 2 diabetes and Alzheimer's disease. And there are just as many diagnostic and therapeutic applications to be developed.



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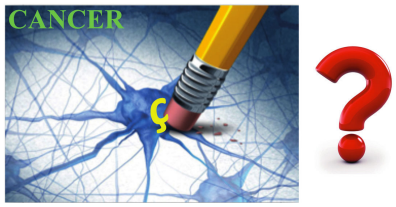

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