

## **CANCERDIP- going beyond genetics in the fight against cancer**

According to the World Health Organisation WHO, in 2005, 7.6 million people died of cancer out of 58 million deaths worldwide, which accounts for 13% of deaths globally. During the onset and progression of most human tumour types, and besides the more classical genetic alterations, a growing number of *epigenetic* alterations have become hallmarks of the disease. In order to tackle cancer from this new angle, scientists worldwide are acknowledging that new research strategies are required.

In January 2008, the Cancerdip project emerged as the joint effort of leading European groups in the field of epigenetics to help define the epigenomic profile in a number of human cancers. The action is coordinated by Dr Manel Esteller, director of the Cancer Epigenetics and Biology Program (PEBC), a newly inaugurated initiative based at the Bellvitge Institute for Biomedical Research (IDIBELL-ICO) in Barcelona, which enjoys the support of the Ministry of Health of the Generalitat de Catalunya. The CANCERDIP project is funded with € 3 million from the European Commission under its 7<sup>th</sup> Framework Programme. In total, it involves more than 20 molecular and cellular biologists, cancer experts and bioinformaticians from 5 different countries (Spain, Belgium, The Netherlands, Germany and Italy), organised in 6 research groups. Additionally, a special collaboration has been established with the Broad Institute of MIT and Harvard. The consortium's ultimate goal: to characterize the epigenetic machinery in cancer (with a focus on colon cancer and leukaemia), and to map the actual epigenetic changes that lead to the illness.

Epigenetics, or what lies beyond genetics, deals with all those inheritable traits based outside the DNA sequences which make up our genes. They are special chemical modifications which occur in our genetic material, and constitute an additional layer of complexity in the biology of our cells: these modifications are tightly regulated by cellular mechanisms throughout the life of the cell, and are responsible for decisions such as growth or arrest, differentiation or death. It is therefore not surprising that epigenetic modifications are found to be deregulated in a variety of diseases, including cancer.

The study of defective DNA methylation patterns (one of the major epigenetic modifications that is found altered in cancer) is thus of the utmost importance. These patterns are not only characteristic of the cancer state, but can also be used as predictors of cancer behaviour and of the response to treatment. In this context, one of the main aims of the project is to develop novel, cutting-edge tools to detect and isolate the epigenetic modifications present in tumours. Cancerdip's efforts to develop such tools is channelled through Diagenode, a Belgium-based biotechnology company that is also a member of the consortium, and whose participation ensures constant feed-back between basic research and clinical applications, bringing the very latest findings in the epigenetic field right to the clinician's doorstep.

The Cancerdip project runs for a total of three years, with completion scheduled for December 2010.

For further information, please visit the project website at [www.cancerdip.eu](http://www.cancerdip.eu) and [www.pebc.cat](http://www.pebc.cat) .

