



European
Commission

The **big impact** of smaller companies on treating **blood-based diseases**



GENOME INTO EPIGENOME

Thanks to the human genome project finished 10 years ago, scientists now know the full genetic code of human DNA, but they don't yet fully understand how this genetic information is used in creating different types of cells with distinct functions.

DNA is the basic building material that is identical in every cell, but how do we create both brain cells and liver or lung cells using this same basic material? In this context, the genome contains all the genetic information, but not in a form that is readily understood. Therefore, a

masterplan, or blueprint must be applied to instruct molecules how to create specific cells and this blueprint is called the epigenome.

In the very complex area of genetics, the Blueprint project is aiming for big practical results which one day will take blood-based disease treatments to a new level. The partners, who represent an exceptional body of knowledge in epigenetic science, are working together to map the formation of infinite combinations of blood cells starting from one common genome. Among the 41 partners, nine are SMEs with vital expertise for the success of this project. Ultimately, the project, together with genome analysis, is expected to unravel many of the questions surrounding the regulation of normal as well as abnormal blood development.

THE SOBERING FACTS:

BLOOD-BASED DISEASES such as leukaemias and diabetes claim many thousands of lives each year.
UNDERSTANDING HUMAN DNA still does not unlock the answers for effective personalised treatment.
PROGRESS IN TREATING THESE DISEASES CAN ONLY COME WHEN WE MASTER HOW INDIVIDUAL GENES ARE SWITCHED ON OR OFF AND HOW TO INTERVENE IN THIS PROCESS.

"We are confident that we will identify new diagnostic biomarkers that can distinguish normal cells from diseased ones. It's very exciting to think that we may even piece together a complete picture of blood formation starting from blood stem cells."

"The SMEs in Blueprint are essential partners. These companies are equally at home talking with academics as with pharmaceutical companies. They know their own commercial strengths and have enough flexibility to collaborate with a wide range of other partners."

Professor Henk Stunnenberg, Radboud University, Department of Molecular Biology, The Netherlands.

Duration: October 2011 - April 2016
Budget: EUR 39.9 million (EU contribution EUR 30 million)

Partners/countries

BLUEPRINT involves 41 partners from nine EU Member States, Switzerland and Israel. A full list is available at www.blueprint-epigenome.eu

Project website

www.blueprint-epigenome.eu

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The Blueprint project received EU funding under the 7th Framework Programme for Research

SEEING THE BIG GENETIC PICTURE BY MAPPING BLOOD CELLS

The Blueprint project is focusing entirely on understanding the epigenomes of blood cells. 41 European partner institutes with world-class expertise are united within the project which is the cornerstone of the EU's contribution to the IHEC, the International Human Epigenome Consortium. Around the world, other collaborative research projects are also active in the field of epigenetics, not primarily related to blood but other cell types, and all feeding into the IHEC.

They have an agreed goal and challenge between them to create 1 000 epigenomes. Collectively, this will push the scientific boundaries much further and set up the next stage of research into how the epigenome changes in disease, in aging and under different (environment) conditions and how it responds to drug treatments.

DYNAMIC SMEs

The hope of reaching such ambitious project goals in drug development is only possible with some very dynamic companies on board that can bridge the gap between academia and pharmaceutical companies. Typically these are SMEs (small and medium-sized enterprises), because they thrive in this middle ground. They are contributing unique expertise and technology and also tend to be more flexible and collaborative than large companies.

Sigolis, a small innovative company based in Sweden, has experience in the development of microstructures for a wide range of areas in life science. The technologies they design may in due time contribute towards clinical applications for diagnostics or prognostics.

Cellzome, another SME participating in the Blueprint consortium, has a strong track record of developing novel compounds that alter the enzymes that read, write and erase the epigenome. An article published in Nature in October 2011 explains their groundbreaking approach and they have featured again in the March 2012 issue of Nature Biotech.

THE COLLABORATIVE POWER OF BLUEPRINT

A vast project such as Blueprint, means that researchers must draw on all relevant knowledge and work across academic and medical fields.

It's reassuring to know that around three-quarters of the participants are experienced not just in their field but also in other European research projects. They know the challenges of communicating between languages and cultures, but they also have a vision for the added-value that this generates. Their commitment and perseverance ensures that the vision becomes a reality.