

PRESS RELEASE

Curing Parkinson's with stem cell research?

The HEALING project raises hopes for the arrival of new substances to control stem cells. Apart from new disease therapies, the project promises major scientific advances as well as economic benefits. Seven universities and one partner from industry, located in eight countries, collectively perform research to discover a solution that will be invaluable to the biotech and pharmaceutical industry.

Why stem cell research?

The human body is a remarkable phenomenon. If we scratch our knee or cut ourselves, the wound will heal seemingly on its own. However, complex processes inside and between the cells lie behind the regeneration of skin and nerve tissue. Stem cells are known to play an important role during wound healing although the precise events of the healing process are still largely unknown.

The goal of the HEALING project is to uncover how stem cells influence the regeneration of cells and tissue. However, the aims of the HEALING project are about more than just an understanding. Novel chemical substances will be developed to improve cell regeneration and thus wound healing in a ground-breaking manner.

Hope for a cure

Degenerative diseases such as Parkinson's disease and leg ulceration are widespread and especially affect elderly people. Since the number of senior citizens is steadily increasing within the population, the frequency of these degenerative diseases is rising as well. Within Europe, more than 1.3 million people and 1.6% of the over 65-year olds are afflicted with Parkinson's disease. Leg ulcers, which are chronic wounds, also occur with higher frequency these days and affect about 5% of the Western population. People suffering from degenerative diseases or chronic wounds eagerly await new treatment strategies. Stem cell research holds great potential for that – and this is the point where the research project HEALING comes into play.

What are stem cells?

Adult stem cells have the ability to provide new cells to replace older ones. In this way many diverse organs, e.g. the skin, can be constantly renewed throughout life or healed after injury. The accurate regeneration of the organ is determined by the size, the number, the orientation and the pattern of the daughter cells which emerge from the stem cells. Therefore, it is critical that the cells communicate with their environment.

Moreover, the particular manner of this communication controls the stem cells' behaviour, dissemination and survival.

What is Hedgehog-Gli?

Cells communicate with each other using chemical compounds, so-called signalling molecules, like Hedgehog. A signalling molecule is sent out by one cell and it can be received by another cell with the appropriate receptor. The signal is then transmitted to the cell's interior. Here, the signal gets processed by so-called transcription factors, which are able to turn single genes on and off. This is how the fate of the cell is decided, i.e. into which cell type the cell will develop. An important example of a transcription factor is Gli. Together with Hedgehog, it makes up the Hedgehog-Gli signalling pathway, that is central to the research of the HEALING project.

Hedgehog-Gli: The key to control degenerative diseases?

The Hedgehog-Gli signalling pathway is activated mainly in the early embryonic development stage, dictating the formation of the body axis and the limbs. Inactivation of the pathway during this early phase of development causes severe dysfunctions, such as cyclopia. This abnormality of the brain and skull usually prevents the survival of the newborn.

In adult life, the Hedgehog-Gli pathway is generally less active. However, in some organs, especially the skin or nervous system of the brain, Hedgehog-Gli signals are required for normal organ function. Excessive activity of the pathway can result in cancer formation and abnormal growth. Hence, a mutation in the Hedgehog-Gli pathway underlies the genetic disease "Gorlin syndrome", which is characterised by a high incidence of skin and brain tumours.

Competitive project

The HEALING project has been rated as excellent by the European Commission and receives funding of 3.6 million Euro. European funding programmes are in great demand, but only a small fraction of the submitted project proposals receive financial support. HEALING competed with about 1,000 other applicants. Amongst all submitted proposals, the HEALING project was ranked in the top 9%.

HEALING is a "Marie Curie Initial Training Network" and is funded by the Seventh Framework Programme (FP7), the largest research and development funding programme of the European Union.

For the professional organisation of the proposal as well as for project management and dissemination activities accelopment AG, a service provider localised in Zurich, was engaged.

Europe-wide project

The expertise of renowned scientists of seven universities from Switzerland, Greece, UK, Italy, Austria, Sweden and Spain as well as a of a chemical company from Germany strengthens the 4 year research project.

Cooperation with industry ensures that new research results can be processed directly.

Training programme

Early and experienced researchers, 13 PhD students and 4 Post-docs, are trained in various topics, such as developmental genetics, stem cell and molecular biology, biochemistry or business skills etc. These qualifications are strongly required in their careers in both industry or science.

One project – many winners

The HEALING project offers an excellent opportunity for science and the pharmaceutical and biotech industries. Its findings could prove to be a milestone for stem cell research. But the ultimate winner from new scientific and medical results would be the human population.

Upcoming HEALING events

1st HEALING International Meeting, Kolymbari, Crete 23-25 June 2011
www.fp7-healing.eu/internationalmeeting

1st HEALING Summer School, Kolymbari, Crete 20-22 June 2011
www.fp7-healing.eu/summerschool

Further information

www.fp7-healing.eu

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