



CASE STUDY

From the laboratory to the clinic

EU-funded EuroStemCell research teams making breakthrough discoveries in diseases of the nervous system and cancer

The EU-funded **EuroStemCell** aims at building the scientific foundations required to take stem cell technology to the clinic. The research initiative combines the expertise of more than 100 researchers across 27 research groups in 14 partner institutions and integrates a broad range of disciplines and the expertise of the best laboratories in Europe¹.

EuroStemCell is a **virtual European stem cell centre** where research is focused on identifying, comparing and evaluating the properties and clinical potential of different types of stem cells. The initiative was on top of the list of the first Integrated Projects in Europe's Sixth Research Framework Programme (FP6) and receives €11.9 million from the European Union as part of a total budget of €16.35 million.

When the EuroStemCell consortium was first launched in 2003 Professor Austin Smith, project coordinator from the Institute for Stem Cell Research in Edinburgh, made it clear that the pan-European initiative aspired to produce clinical treatments for a wide range of diseases and medical conditions. "After all the hype, now is the time to find out whether we can understand stem cells well enough to use them for medical benefit. The EuroStemCell project is very exciting because it unites the very best European stem cell researchers in this challenge. Our common goal is to advance this research from the laboratory towards the clinic," said Prof. Smith. Recent achievements of the EuroStemCell scientists prove that they are on course and on target.

Less than two years into the project, European stem cell researchers working for the EuroStemCell initiative made several **breakthrough discoveries** to bring Europe closer to making regenerative medicine a reality. One team managed to grow human brain stem cells *in vitro* while another group of scientists shed light on how the human body controls the development of stem cells.

Anybody with family or friends who have been diagnosed with Parkinson's, Alzheimer's Disease or Multiple Sclerosis understands how incapacitating these illnesses can be. These neurodegenerative diseases have a gradual effect on key physical and mental capacities of those affected, forever changing their lives -- and the lives of their families. Until now there has been little hope of finding a cure for these and other **diseases of the nervous system**.

¹ The 14 participants are from Denmark, England, France, Germany, Italy, Scotland, Sweden and Switzerland. They comprise universities, research institutes and 3 biotechnology companies. The project was selected after a call for proposals and very positive evaluation by independent experts.
www.eurostemcell.org

A major breakthrough in this area, however, was achieved by researchers from Milan and Edinburgh in August 2005. Luciano Ponti and Steven Pollard developed a technique to **grow pure brain stem cells *in vitro***. They found that cell cultures could be used to model neurodegenerative diseases that will allow scientists to experiment with different cures with a hope of finding one that works.

In November 2005 EuroStemCell project team made another important discovery which might help understand the processes responsible for **tumour development**. Until now, scientists knew that stem cells could grow more easily as undifferentiated cells when oxygen levels were reduced but could not explain why. The scientists from Karolinska Institute in Stockholm were able to explain the molecular basis of this phenomenon and discovered the Notch proteins in the process. (The Notch family of proteins is a critical regulator in the process of differentiation of stem cells.) The link between Notch proteins and reduced oxygen levels may prove useful to cancer research, providing new insights into molecular processes at work as tumours develop, opening up possibilities for new **cancer treatments**.

While the breakthrough scientific discoveries made by the EuroStemCell researchers are published in peer review journals, the EuroStemCell project makes an effort to keep the general public up to date. A recently released short film "**A stem cell story**" uses animation, advanced photography and documentary footage to capture the complexity of stem cell science and guides viewers through the current and future clinical applications.

EuroStemCell is one of fourteen projects on stem cell research that have been supported in the Genomics and Biotechnology for Health field under the EU's Sixth Framework Programme. Other projects deal with such subjects as treatments for bone and cartilage disorders, heart disease, spinal cord injury and stroke, improving outcome of bone marrow transplantation, and therapeutic use of cord blood. Taken together, these projects mobilise about 180 research teams in Europe and represent an EU investment of almost €70 million. A feature of the projects is that they compare performance of stem cells from different sources, including, in some cases, from human embryos. All such projects are subject to independent ethical review and must conform to relevant local regulations.

For more project examples please see the EU's [stem cell research site](#).

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For more information, including requests for a copy of the film, please contact:

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