MEDIA RELEASE

4th November 2005

FOR IMMEDIATE RELEASE

Oxygen and development - stem cell researchers notch up new insight

EuroStemCell researchers at Stockholm's Karolinska Institute have made an important new discovery about the role of oxygen in development. Their research, published this week in Developmental Cell, may shed light on the processes at work in tumour development and has implications for successfully growing stem cells in the laboratory.

Scientists have observed that stem cells grow more easily as undifferentiated cells when oxygen levels are reduced. But until this week, they didn't know why.

The Karolinska researchers provide, for the first time, a molecular basis for this phenomenon, and uncover a role for the Notch signalling pathway in the process.

The Notch family of proteins are critical regulators in the process of differentiation – where stem cells take on more specialised functions.

"Understanding how the body precisely controls stem cell fate is a key goal of stem cell research," says EuroStemCell researcher Urban Lendahl.

"Our finding that Notch signalling mediates the effect of reduced oxygen levels on brain and muscle stem cells will help researchers working on these cells to replicate the body's mechanisms in the lab. This is an important prerequisite for developing safe and effective clinical applications," Lendahl adds.

The link between Notch and reduced oxygen levels may also prove useful in cancer research. Certain types of tumour develop because of mutations in the machinery that sense reduced levels of oxygen (hypoxia) in the body. This week's findings may provide new insights into the molecular processes at work as these tumours develop, and open up possibilities for interrupting these processes.

This research is published in Developmental Cell this week:
Gustafsson M., Zheng X., Pereira T., Gradin K., Jin S., Lundkvist J., Ruas J.L., Poellinger L., Lendahl U., and Bondesson M. (2005) Hypoxia requires Notch signaling to maintain the undifferentiated cell state. Dev. Cell 9(5):617-28
http://dx.doi.org/10.1016/j.devcel.2005.09.010

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Notes to Editors:

EuroStemCell is a four-year Integrated Project of the European Union's Sixth Framework Programme, and will receive up to €11.9 million in funding from the EU. The 14 participants are from Scotland, England, Sweden, France, Denmark, Italy, Germany, and Switzerland. They comprise universities, research institutes and 3 biotechnology companies. EuroStemCell's mission is to build the scientific foundations required to take stem cell technology to the clinic.