THE UNIVERSITY of EDINBURGH

News Release

Issued: Thursday 16 February 2017

Blood study insight could help improve stem cell therapy success

Researchers have pinpointed a key enzyme that is vital for the production of fresh blood cells in the body.

The enzyme is essential for the survival of specialised stem cells that give rise to new blood cells, the study found.

Experts say the findings could help to improve the success of stem cell therapies that are being developed to treat some blood cancers and disorders of the immune system.

Scientists focused on an enzyme called fumarase, which is known to play a key role in the generation of energy inside cells.

Children with gene mutations that affect fumarase have blood defects, which prompted researchers to investigate its function.

The mouse study found that deletion of fumarase from blood cells causes major defects in new blood cell production.

These defects could be traced back to defects in the specialised stem cells that give rise to new blood cells.

Blocking the enzyme causes a molecule called fumarate to build up inside the cells, which has wide-ranging toxic effects.

The study sheds new light on the conditions that blood stem cells need to survive, which could help to boost the success of stem cell therapies, the researchers say.

The research was prompted when researchers noticed that children with genetic mutations in the fumarase gene have blood defects.

Scientists from the Medical Research Council Centre for Regenerative Medicine at the University of Edinburgh led the study. The research is published in the *Journal of Experimental Medicine* and was funded by The Kay Kendall Leukaemia Fund, Cancer Research UK, Bloodwise, Tenovus Scotland and Wellcome.

Professor Kamil Kranc, CRUK Senior Research Fellow at the University's MRC Centre for Regenerative Medicine, said: "Stem cell metabolism is an emerging field of research with an immense therapeutic potential. In future, we hope to identify the biochemical pathways affected by fumarate in stem cells and, by manipulating these pathways, improve the success of stem cell transplant therapies."

For further information, please contact:
Jen Middleton, Press & PR Office, tel 0131 650 6514, email Jen.Middleton@ed.ac.uk