THE UNIVERSITY of EDINBURGH

Tissue Injury & Repair Group, Clinical Sciences (Surgery)/Centre for Regenerative Medicine
Chancellor's Building, Little France
EH16 4SB, Edinburgh, UK

ed.ac.uk

Project leader

Prof. Jim Ross

Head of Division CNS
Phone +44 131 242 6354
Fax +44 131 242 6520
E-Mail

Institute presentation

For more than 400 years, the University of Edinburgh, its people and their achievements have rewritten history time and again. They've explored space, revolutionised surgery, published era-defining books and introduced to the world many creations and ideas from Sherlock Holmes to the Higgs boson.

The University of Edinburgh offers around 500 undergraduate degree programmes, more than 300 taught masters degrees and 135 research areas, covering a broad range of subjects in humanities, social science, medicine, veterinary medicine, science and engineering.

As one of the UK's top five universities for research, our global reputation for innovative research and high-quality teaching attracts some of the world's best minds to work and study here. We are home to nearly 28,000 students – more than 9,000 of those come from outside the UK – and 80 per cent of our undergraduates leave with either a first-class or 2:1 degree.

Edinburgh is also one of the UK's leading universities for research commercialisation. In 2011/12, our staff or students created 35 new companies. Commercially successful innovations to have emerged from Edinburgh include the first automated industrial assembly robot, the world's first genetically engineered vaccine for hepatitis B, and an image-sensing microchip that revolutionised the digital camera industry.

Jim Ross is Professor of Liver Cell Biology and director of the Tissue Injury & Repair Group. The group is part of the University of Edinburgh/MRC for Regenerative Medicine and has developed particular expertise in the isolation and functional characterisation of adult and foetal human hepatocytes and both pluripotent stem cell-derived and foetal liver stem cell-derived populations including hepatocytes.The group have published extensively in the area of liver cell biology, liver involvement in inflammatory processes, cancer and stem cell biology.

The process of differentiation of an individual hepatocyte from its stem cell origins is still poorly characterised. Information regarding the differentiated state of adult hepatocytes and that of fetal, embryonic or induced pluripotent stem cell-derived hepatocytes will be valuable in ascertaining how closely in vitro differentiation mimics the in vivo situation. In addition, such information will provide not only basic knowledge on the process of differentiation but may contribute to future use of stem cell-derived liver cells in artificial support devices, in regenerative medicine/transplantation and in cell-based assays for drug discovery and toxicology. Related areas of interest include investigating the mechanisms of liver repair following damage or hypoxic insult and the induction of stress (heat shock) proteins (pre-conditioning) in order to protect from a more severe insult. We continue to investigate the contribution of the liver to the systemic inflammatory response in cancer and cardiovascular disease. We use a combination of primary human cells and cell lines, human ES and iPS cells and rodent models to examine the differentiation and function of adult and progenitor liver cells. Cell function and cell fate are analysed using molecular, biochemical and proteomic techniques.