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Embryonic stem cells could help to overcome immune rejection problems

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Tissues derived from embryonic stem (ES) cells could help to pacify the immune system and so prevent recipients from rejecting them, the UK National Stem Cell Network Science Meeting will hear today. Speaking at the conference in Edinburgh, Dr Paul Fairchild from the University of Oxford will tell delegates that although tissues derived from ES cells succumb to rejection, they have an inherent immune-privilege which, if exploited, could have far reaching implications for the treatment of conditions such as diabetes, heart attacks and Parkinson's.

The exciting potential of ES cells for use in regenerative medicine may only be realised by better understanding of how to manage the body's immune response to them. With funding from the Medical Research Council, Dr Fairchild and Dr Nathan Robertson are investigating whether tissues derived from ES cells will be rejected in the conventional manner or whether the recipients will not recognise them as foreign.

So far, their findings suggest that, while ES cells are fully susceptible to rejection, they do display some underlying immune privilege which, with better understanding, could be harnessed to promote the activity of regulatory T-cells to suppress activation of the immune system.

Dr Paul Fairchild, explains: "Our work provides hope that the immune system may be persuaded to accept tissues derived from ES cells more readily than has been the case for tissues and organs from conventional sources. It appears that ES cell-derived tissues contribute to their own

acceptance by creating an environment conducive to T cell regulation, which may one day be harnessed therapeutically."

The Oxford team generated a panel of ES cell lines from strains of mice that differed from recipients by increasing levels of genetic disparity and used them as a source of tissues for transplantation. Their results show that while minor differences between the two strains provoke prompt rejection in the absence of immune suppression, ES cells do show an underlying tendency for immune privilege.

The next stage of the team's work is to explore further the molecular and cellular basis of this immune-privilege, whether it might be augmented therapeutically and whether unwanted viruses or tumours could exploit ES cell-derived tissues as a safe-haven where they can evade the normal immune response.

Source: Biotechnology and Biological Sciences Research Council