Cardiovascular derivatives of pluripotent stem cells in cardiac repair, drug discovery and disease
C. Mummery

1Leiden University Medical Centre, Department of Anatomy and Embryology, Leiden, Netherlands

Published on 23 Oct 2010

Heart and vascular endothelial cells from human pluripotent stem cells are of interest for applications in cell therapy and cardiovascular disease. Differentiation protocols are now sufficiently refined that production of cardiomyocytes, endothelial- and smooth muscle cells is fairly efficient and reproducible. Genetically marked hESCs have been produced in which expression of eGFP is ubiquitous or under lineage specific control. We have used various tagged hESC-lines to trace cardiomyocytes following transplantation into a mouse heart after myocardial infarction and to select cardiovascular progenitors as a source of the different cardiovascular cell types. Although cardiomyocytes survive for months in the mouse heart and cause early improvements in function, these are not sustained. Cardiovascular progenitors from hESC and hiPSC however, present more immediate applications in drug discovery, toxicity and cardiovascular disease modelling. Results of these studies, in particular drug responses of hESC-derived cardiomyocytes and a hiPSC model for vascular disease, will be shown.