STEM CELL SOCIETY
SINGAPORE

STEM CELL SOCIETY SEMINAR-cum-AGM 2011

Wednesday, 16 March 2011

Breakthrough Theatrette, Matrix Building Level 4, 30 Biopolis Street, Singapore 138671

PROGRAMME

4.00 – 5.00pm

Seminar by **Special Guest** : **Prof Peter W Andrews**
Centre for Stem Cell Biology and Department of Biomedical Science, The University of Sheffield, UK

"Culture Adapted Human Embryonic Stem Cells: Thugs or Samaritans?"

HOST: Dr Steve Oh, Principal Scientist, Bioprocessing Technology Institute

5.00 – 5.20pm

SCSS Annual General Meeting 2011
For Members of Stem Cell Society Singapore ONLY.

5.20pm onwards

Network Social
Provided by Stem Cell Society Singapore. For Members of Stem Cell Society Singapore ONLY.

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"Culture Adapted Human Embryonic Stem Cells: Thugs or Samaritans?"

ABSTRACT

Stem cells are inevitably subject to strong selection for variants that exhibit an increased likelihood of self renewal rather than differentiation. Given sufficient time one might anticipate that any stem cell will evolve to the oxymoron of a nullipotent state. A currently popular hypothesis is that cancers are composed of cancer initiating cells with stem cell-like properties, either derived from tissue stem cells, or from later stage progenitor cells that have acquired such properties. In either case cancers typically involve defects in the mechanisms that balance cell differentiation and proliferation. In its simplest form, the cancer stem cell hypothesis assumes that cancer stem cells will represent a small proportion of a tumour. However, if stem cells tend to evolve towards a nullipotency, cancers involving a stem cell compartment should also progress so that they are eventually composed entirely of nullipotent stem cells. In such tumours almost all the cells could be 'cancer-initiating' and presumably this evolution would correlate with the progression of a cancer to a more aggressive state. Embryonic stem (ES) cells also evolve in culture, often acquiring marked genetic and epigenetic changes. Such 'culture adapted' ES cells may show marked changes in behaviour, including enhanced growth characteristics, altered capacity for differentiation and the ability to produce malignant retransplantable tumours: they raise significant concerns about safety for applications in regenerative medicine. On the other hand, the phenomenon provides a valuable tool for dissecting the mechanisms underlying stem cell behaviour, and offers a model with which to study cancer evolution *in vitro*. Understanding the drivers of genetic change in stem cells is central to developing safe and cost-effective applications in regenerative medicine, as well as for developing new approaches to cancer therapy.

BIOGRAPHY

Peter Andrews obtain a BSc in Biochemistry from the University of Leeds in 1971, and a D.Phil. in Genetics from the University of Oxford in 1975. Following postdoctoral research at the Institut Pasteur in Paris and the Sloan Kettering Institute in New York, he was a research scientist on the staff of the Wistar Institute of Anatomy and Biology in Philadelphia from 1978 to 1992. In 1992 he was appointed to the Arthur Jackson Chair of Biomedical Research in the University of Sheffield, where he is currently co-director of the Centre for Stem Cell Biology. He was also the co-ordinator of ESTOOLS, a European Integrated Project of 21 partners under the sixth framework program. His research focuses on the biology of pluripotent human stem cells. Among his current activities, he co-ordinates the International Stem Cell Initiative, which is focused upon characterising standard markers and culture conditions for human ES cells.