

**ABSTRACT OF THE SPEAKERS AT THE STEM CELL RESEARCH FORUM
ON 21 MAY 2003 AT SUBIACO THEATRE CENTRE**

1. PROFESSOR ALAN TROUNSON

Stem Cell Research – Opportunities and Issues

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Stem cells are found in all tissues of the body and may be responsible for tissue repair and regeneration. However, little is known about the messages necessary to mobilise stem cells for tissue repair in-vivo, although ex-vivo multiplication and differentiation can be demonstrated in vitro. It is also likely that some stem cell types, eg. bone marrow – mesenchymal stem cells, cord blood haematopoietic and others at least, are capable of transdifferentiation into tissues that are different to those of their origin. It has been argued that some multipotential adult stem cells retain the pluripotential phenotype or are more easily reprogrammed when exposed to a new tissue type. These observations are of interest for autologous cell therapies where certain tissue types may be repaired by mobilising endogenous stem cells or the use of the patient's own stem cells expanded ex-vivo and directed to the tissue needing repair.

Embryonic stem (ES) cells are pluripotential, easily expanded in vitro and capable of populating a variety of tissues. Little is known at present about their survival when used as allografts. Some claims have been made about tolerance to mismatching but persuasive data is lacking. Several strategies are proposed for transplantation of ES cell derivatives which include: somatic cell nuclear transfer (SCNT); the induction of pluripotentiality of somatic cells; and the induction of immune tolerance.

The Australian Governments have agreed to provide access to excess unwanted preimplantation embryos from infertility treatments (eg. IVF), if frozen prior to 5th April 2003, for research purposes. This could include the derivation of new ES cell lines. This may provide the opportunity to determine the potential benefit of ES cells for enabling tissue repair in serious diseases, pathologies and injuries.

2. PROFESSOR ALAN R HARVEY

Cell Replacement in the Central Nervous System – Why do we need it and can we do it?

**School of Anatomy and Human Biology and Red's Spinal Cord Laboratory, CTEC,
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The use of grafts to repair injured peripheral nerves is now a well-established clinical procedure, but progress in CNS transplantation has been slower. In the brain or spinal cord, cells or tissues might be used to (i) help repair damaged fibre tracts linking different processing regions, or (ii) help protect or replace endogenous neurons or glia that are dying or are already lost as a result of disease, trauma or stroke.

The first graft of human fetal neural tissue into a patient who was suffering from Parkinsons disease was performed in 1988. Small numbers of clinical trials have continued with variable but occasionally encouraging results. The range of neurological conditions subject to experimental fetal transplant therapies has been extended, and includes Huntingtons disease, retinitis pigmentosa and spinal cord injury (syringomyelia). Despite initial promise in this field, there is a perception that there are problems associated with the use of fetal neural tissue grafts, thus many researchers are intensively promoting undifferentiated, multipotent stem cells as a future resource for neural repair and cell replacement. The origin of these stem cells is the subject of much controversy; they can be obtained from embryos, fetuses, umbilical cord blood or from adults, such as from adult bone marrow. What is clear is that, irrespective of the origin of the neural precursors, to be successful the cells should be differentiated towards the appropriate cell type in vitro prior to transplantation. It then needs to be discovered whether such cells can effectively integrate into the complex circuitries that make up the mature host CNS – no easy task.

3. MS DAPHNE ANDERSEN AND DR SANDY WEBB

The regulation of embryonic stem cell research: one year after the COAG decision of 5 April, 2002

This talk will focus on the 5 April 2002 decision of the Council of Australian Governments (COAG) and briefly discuss issues behind elements of the decision and how, one year on, the decision has been implemented. Included will be brief discussion of the Prohibition of Human Cloning Act 2002 (Cwlth) and the Research Involving Human Embryos Act 2002 (Cwlth), progress towards consistent state and territory legislation, and the significance of the Reproductive Technology Accreditation Committee and the National Health and Medical Research Council's guidelines under this legislation.

4. DOCTOR JOHN I. FLEMING

Therapeutic and scientific imperatives – but what about the common good?

The scientific project is driven by the need to find knowledge and to apply that knowledge for the good of human beings. Where stem cells are concerned the therapeutic imperative and the scientific imperative trump all other ethical considerations in the formulation of public policy. But the common good of human beings is not to be so narrowly construed, knowledge and health being only two of the goods in which human beings should strive to participate. The popular mood seems to support the therapeutic imperative “at any cost”. The ethical and social costs are far greater than many have anticipated, particularly those who have an interest in minimizing and explaining away “ethical problems” with what they really want to do to further their personal goals.

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