

Committee Secretary
Community Affairs Committee
Department of the Senate
PO Box 6100
Parliament House
Canberra ACT 2600
Australia

Dear Sir/Madam

Thank you for the opportunity of making comment on the legislative responses to recommendations to the Lockhart Report.

Background

By way of background, we advise that we are senior members of the **Diabetes Transplant Unit** (DTU), a cutting-edge research group in Sydney and part of both the University of New South Wales and the Prince of Wales Hospital. The DTU is using both embryonic and non-embryonic stem cells to try and create insulin-producing cells as a therapy for diabetes. Non-embryonic stem cells include cord blood and immature pancreatic cells.

Since 2002, when the *Prohibition of Human Cloning Act 2002* and the *Research Involving Human Embryos Act 2002* were passed by Parliament, the DTU has:

1. made under licence a human embryonic stem cell line, called the Endeavour-1 line, from spare fertilized eggs provided by IVF Australia.
2. demonstrated how to produce cell clones from human embryonic stem cells. Different clones may well be required to most efficiently produce, for example, nerve cells or insulin-producing cells.
3. developed a special type of human feeder cell to help in the selection of genetically manipulated embryonic stem cells
4. demonstrated how to prevent the formation of tumours when embryonic stem cells are transplanted. This is by placing the cells inside microcapsules made of a product from seaweed.
5. learnt how to make and grow human embryonic stem cells under animal-free conditions
6. learnt how to attach human embryonic stem cells onto biodegradable 3D scaffolds to better encourage their growth and differentiation
7. converted embryonic stem cells into insulin-producing cells as a potential therapy for insulin-dependent diabetes. The process has, as yet, to be optimized.
8. attempted (so far unsuccessfully) to convert cord blood cells into insulin-producing cells
9. demonstrated that immature pancreatic precursor cells will develop into insulin-producing cells and that the more immature the cells are, the less likely they will be rejected when transplanted.

The DTU is also facilitating the research of others, including the production of neurones for the potential treatment of Alzheimer's Disease, neural precursor cells to assist in the repair of spinal cord disorders, and motor neurones for chronic neurodegenerative disorders.

We are also senior members of and direct the **New South Wales Stem Cell Network**, a group of 500 professionals interested in stem cells. Included in the Network are scientists,

medically trained doctors, ethicists, policy developers, lawyers, commercially minded individuals, and legislators.

We support the recommendations of the Lockhart Report, especially somatic cell nuclear transfer (no 23). Much has been said on this matter, and these comments are appropriately contained in the Private Members Bill of Senators Stott Despoja and Webber. We would wish to emphasize that only by encouraging research with all forms of stem cells will benefits result to the community, both of a scientific and therapeutic nature. The productivity of the DTU since 2002, as described above, is an example of what can be achieved if opportunities are given to Australians to use their minds and abilities.

There are two parts of the Lockhart Report that we wish to comment on further. These are not dealt with to any major extent in the Private Member's Bill. They are:

1. Establishment of a Stem Cell Bank (LR 47).
2. Public education concerning stem cells (LR 54).

Establishment of a Stem Cell Bank.

We are of the opinion that such a Bank is needed and should serve three purposes:

(a) storage of fully characterized embryonic and non-embryonic stem cell lines (similar to the UK Bank) The lines should be divided into two groups (i) those produced under conditions of Good Laboratory Practice, (ii) those produced under conditions of Good Manufacturing Practice. Only cells produced under this latter condition would be useful for clinical purposes.

(b) distribution of stem cell lines to researchers on the basis of cost recovery and facilitation of the use of such lines by researchers.

(c) acting as an official site to deposit stem cell lines, thereby meeting international standard required for patenting purposes as per the Budapest Treaty. At present, Australia has no such facility, the nearest one being in China.

It is our experience that purpose (b) is best handled by being in proximity with researchers requiring the stem cells. Thus, the two collaborations we referred to above, namely the production of cells of potential use for Alzheimer's Disease and spinal cord disorders have blossomed because of this physical proximity.

We believe, therefore that **an Australian Stem Cell Bank should be a virtual one**, with centres in those capital cities with strong interests in stem cells. Such cities are likely to be Sydney, Melbourne and Brisbane.

Purposes (a) and (c) could be addressed by having a single site for the Australian Stem Cell Bank. However, equally they could be addressed by using several sites and a central steering Committee containing representatives of each of the sites. The Committee would be responsible for the maintenance of a Stem Cell Registry, as well as the making of decisions, for example, which cell lines were appropriately characterized for storage, and how to handle IP issues.

Funding needs to be provided for the steering Committee to meet, the administrative needs of the Committee, as well as the cost of storing stem cell lines. It is suggested that existing storage facilities in different centres be used or, if necessary, upgraded, rather than the creation of new facilities.

Public education and consultation programs concerning stem cells

The New South Wales Stem Cell Network has played an active role in educating the public of what stem cells are and what might be realistically achieved with them. Examples of this education have included:

- a Stem Cell Hypothetical in Sydney and Melbourne (chaired by Dr Norman Swan)
- education evenings for General Practitioners in Sydney and Adelaide
- high school education in Sydney
- provision of information for Questacon to use in their high school education program
- discussions on the media, for example, with Alan Jones on radio 2GB; television shows, such as the 7.30 Report on ABC, and Mornings with Kerry-Anne on Channel 9; and publication of an Opinion Piece in the *Sydney Morning Herald*.

The Network has also conducted several courses teaching scientists how to use human embryonic stem cells.

The Network is equipped to continue the public education process within New South Wales and with support of more local personnel, in other States. It is suggested that funding be made available to facilitate this in at least the following three areas:

- high school education, using ambassadors, such as higher degree students who are using stem cells
- General Practitioner education by way of evening sessions with Divisions of General Practice
- Information evenings for members of the general public. These could be held several times a year, and would need to include a variety of presenters.

We are happy to elaborate on these matters should further information be required.

Sincerely

Professor Bernie Tuch
Director, Diabetes Transplant Unit
Unit
Director, NSW Stem Cell Network

Dr Kuldip Sidhu
Chief Scientist, Diabetes Transplant
Member, NSW Stem Cell Network

Prince of Wales Hospital/University of New South Wales
High St, Randwick
Sydney, NSW 2031 Australia

www.diabetes.unsw.edu.au