
February 2006

Newsletter

Support the creation of a Cell Therapy Facility for the treatment of Diabetes

- The DTU has commenced a clinical trial with donor islet as a treatment for selected Type 1 diabetics.
- A new facility is required to insure that the preparation of islets meets the highest standard of freedom from infection.
- Funds are urgently required for construction to commence with A\$500,000 already committed.
- Naming rights of A\$50,000 to \$150,000 are possible for the various laboratories in the facility.
- If you would like to assist in paving the way for a future cure for diabetes, please contact **Sophie Diller**.

For more information about the Unit please consult its website (www.diabetes.unsw.edu.au) or

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Islet Clinical Trial

On Monday 20 February 2006 the first of six patients in the human islet pilot clinical trial received an injection of islet cells encapsulated in seaweed with the aim of normalizing blood sugar levels.

Encapsulation is a platform technology paving the way for future treatments as it prevents the need for anti-rejection therapy while maintaining passage through the islet of nutrients, waste products and insulin.

Ms Janice Stewart a Type 1 diabetic for 40 years received the one-off injection of encapsulated islets at Prince of Wales Hospital. "If it works it is the best thing that's happened to diabetes since the discovery of insulin", said Ms Stewart, who is a nurse at POWH.

The trial is part of a novel treatment initiated by the DTU and in collaboration with hospital staff, and colleagues here and overseas. Previously DTU personnel have isolated islets from human donors and placed them in seaweed microcapsules showing a lowering of insulin requirement in diabetic animals.

Prof Tuch, director of the DTU cautions "Even if we are able to get a number of people like Janice off insulin, the nationwide shortage of organ donors means alternative sources will be needed.



Ms Stewart receiving the injection of encapsulated islets at POWH



Visiting Researchers

We have been fortunate to welcome two visiting researchers, both from the People's Republic of China, to the DTU in recent times. Dr Li Guo, a post doctoral fellow from Jilin University, has spent the year fusing embryonic stem cells with fetal cells in an attempt to direct the embryonic stem cells to differentiate down specific pathways. Dr Zhou Li, a surgeon from the Harbin University of Medicine, has been utilizing his surgical skills on the human islet transplant project.

Summer Students

The Unit has once again welcomed undergraduate science and medical students to its Summer Research Program. Two of the students won Summer Student Scholarships from the Australian Stem Cell Centre to study at the DTU. The students, Si Ming Man and Lena Soka from UNSW and Megha Mulchandani from the Australian National University, worked for 2 months on specific projects. Lena under the supervision of Dr Kerstin Brands learnt to differentiate liver cells using a growth factor with the aim of converting them into insulin producing cells. Megha under the supervision of Dr Sidhu worked on optimizing the serum free and animal free feeder layer for hESC growth. While Si Ming, also under Dr Sidhu's supervision, worked on optimizing labelling of hESC for tracking once transplanted.

The importance of the program was expressed by Si Ming during his final presentation when he said "I not only gained skills and experience in stem cell science but also

developed an understanding of the dynamics of a research team and how a lab operates.”

New human embryonic stem cell line: Endeavour 1

DTU Chief Scientist, Dr Kuldip Sidhu, has received international acclaim for producing a human embryonic stem cell (hESC) line without the use of any animal products. The breakthrough eliminates the risk of animal -to-human contamination in potential stem cell therapy treatments.

The new line named Endeavour 1 is the first such hESC line produced in Australia in addition to two others in the world. “Our line grows on a feeder layer of human fibroblasts that do not require animal serum and is stable,” said Dr Kuldip Sidhu.



Dr Kuldip Sidhu announcing the Endeavour 1 line during a press release in January.

Human ESC lines are derived from specialized cells from embryos donated by infertile couples following IVF who have specifically consented for their excess embryos to be used in stem cell research. The National Health and Medical Research Council granted a license to the DTU in collaboration with IVF Australia to produce hESC lines.

“We now hope to collaborate with other researchers using the line and make it available in their own work” said Professor Bernie Tuch, Director of the DTU.

Such lines could eventually lead to better treatments for conditions such as diabetes, Parkinson’s disease, spinal cord injury and event breast cancer.

Lockhart Report

The DTU made a written as well as an oral submission to the Lockhart Enquiry, which last year was investigating the future usage of stem cells in Australia. The Unit supported the expansion of stem cell techniques in Australia, including nuclear transfer, also called therapeutic cloning, to maximize the possible benefits from stem cells. While the report released in December 2005 was favorable to the use of hESC for medical research, the DTU awaits with interest the forthcoming decision from Federal Parliament about changes to existing legislation.

Stem Cell Training Course

The NSW Stem Cell Network and the DTU will be hosting the third hESC training course in April following the success of the first two in February and November 2005. Such courses have received international recognition, being posted on the website of the National Institutes of Health in the United States.

The Course aims to give participants hands on experience in being able to culture, grow and freeze hESC. Participants previously have come from a range of backgrounds including a commercial law firm, government agency, as well as undergraduate and postgraduate university faculties, and they all commented that the “hands on expert tuition was invaluable”.

The April 2006 course has already attracted an international registrant as well as interest from local and overseas applicants. Those interested in attending should contact the Network manager Sophie Diller (s.diller@unsw.edu.au).

Tow Prize

For the first time, a member of the Unit, Jayne Foster, won the Open Senior Division of the Tow Research Day. This is an annual event that brings together researchers in the entire Randwick campus, including the Prince of Wales Hospital, Sydney Children’s Hospital, Royal Hospital for Women, as well as the Medical Research Institutes on site. The title of Jayne’s talk was Transplantation of encapsulated islets as a therapy for type 1 diabetes. Jayne is currently completing her PhD.

DTU PhD student, Justin Lees, consolidated on his success at last year’s Tow prize by taking out a Poster Prize this year. Last year, he had won the Open Junior Division of the Tow Research Day. These wins follow in a tradition of Tow awards achieved by members of the DTU including Best Poster prize by Jian Tu in 1995 and exclusive Tow Prize winner in 1981, Bernie Tuch, who is now Director of the DTU.



Jayne Foster receiving her Tow prize from Prof Les White

Justin Lees also won a Travel Award from the Tow Research Committee to attend two conferences. One was inside Australia, the Annual Scientific Meeting of the Matrix Biology Society of Australia and New Zealand held at Victor Harbour in South Australia during October. The second conference was international, Stem Cells, Senescence and Cancer, held in Singapore also during October.