

A Million Have It!

- More than one million Australians have some form of diabetes
- The incidence of diabetes in Australia has increased by 37% in the last ten years
- Diabetes is now the seventh leading cause of death in Australia
- The annual health care cost in 2010 for diabetes in Australia is at least \$3 billion

We thank the numerous donors to the AFDR and especially the Estate of the late James Ball for your support.

However, further funding for research to replace the need for insulin as a therapy for diabetes is needed.

Help the AFDR to make a difference

Vale the Diabetes Transplant Unit



L to R: Mr Steven Nemes (Director of the AFDR), Dr Bernie Tuch (representing CSIRO) and Dr Ian Dagley (CEO of CRCP) visiting CSIRO

The Diabetes Transplant Unit (DTU) was created shortly after its Director Dr Bernie Tuch moved to the Prince of Wales Hospital in 1991 as a specialist in Endocrinology. Together with two other biomedical research units, it sadly closed 18 months ago following recent changes in Hospital administration.

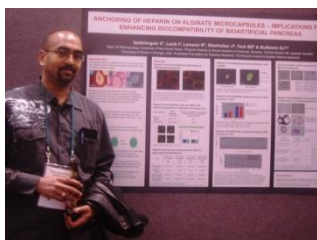
Fortunately all was not lost with the DTU's cutting edge research to find a cell therapy for treatment of insulin-dependent diabetes being continued elsewhere.

The Foundation combined with CSIRO, Australia's largest scientific research organisation, and the Cooperative Research Centre for Polymers (CRCP) to fund the Australia Diabetes Therapy Project. The goal of this bold venture is to introduce stem cells that produce insulin to the clinic. "Stem cells are to be placed inside microcapsules and implanted into humans", said Director of the Project Dr Bernie Tuch, "thereby

hopefully overcoming the need to administer insulin daily". The capsules are needed to prevent the recipient rejecting the grafted cells.

This 5 year project commenced at CSIRO in July last year, and is picking up momentum, with personnel previously at the DTU joining CSIRO. Senior Biologist at CSIRO Dr Meg Evans, who is involved in the Project, is excited about the potential of stem cells and what they have to offer. "I am keen to see this project develop, and hopefully eventually translate into the clinic", she said.

PhD student on Dean's list at University of NSW



Mr Vijay Vaithilingam standing in front of his winning poster at the AHMRC

Vijay Vaithilingam is a fortunate young man. He has just handed in his PhD, on the encapsulation of human islets, to the University of New South Wales (UNSW), and for his efforts received a commendation for outstanding achievement from the Dean of

Medicine, Professor Peter Smith. Mr Vaithilingam was carrying out his PhD with the DTU and after its closure, continued his studies with the support of many, including Dr Gilles Guillemin of UNSW, the AFDR and Professor Jose Oberholzer of the University of Illinois at Chicago.

Also for his efforts, he has received two other prizes. In 2009, he received the best Clinical Poster Prize for *Characterization of Human Islets Encapsulated in Barium Alginate microcapsules - an in vitro*

& *in vivo study* at the 19th annual Research Symposium held at St. Vincent's Hospital in Sydney. In November 2010, he received a further prize from the Endocrine Society of Australia and Society for Reproductive Biology for best poster at the Australian Health & Medical Research Congress (AHMRC). The poster described how to enhance the function of cells in microcapsules when implanted into recipients. Mr Vaithilingam's work has been published by three peer-reviewed international

journals, the *American Journal of Transplantation*, *Pancreas*, and *Review of*

Diabetic Studies. The first of these has the highest impact of transplant

journals in the world. Well done Vijay, who has accepted a post-doctoral

position to continue his studies on cell encapsulation at CSIRO.

Western Australia Institute of Medical Research

Keen to continue the excellent work of the DTU, the AFDR looked to collaborate with diabetic units elsewhere, in pursuit of the goal of developing a stem cell therapy for the treatment of insulin-dependent diabetes.

Professor Grant Morahan, Director of the Centre for Diabetes Research at the Western Institute of Medical Research (WAIMR), put up his hand

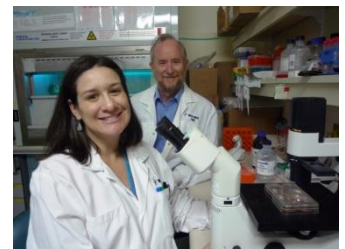
to collaborate. After careful consideration and independent review, the AFDR entered into an agreement with the University of Western Australia, under which the WAIMR operates, to conduct a research project using human embryonic stem cells.

The aim was to understand how mature insulin-producing cells formed from these stem cells.

“Knowledge gained from the project will assist in understanding how to create a sufficient number of insulin-producing cells that can eventually be used clinically”, said Research Assistant Professor Erika Bosio, who is conducting the project at the WAIMR with Professor Morahan.

Assisting the team in Perth is Dr Justin Lees, a former postdoctoral fellow at the DTU. He was involved in

the precursor studies to this project, and continues to provide support via phone and email from Sydney.



Prof Grant Morahan and A/Prof Erika Bosio in the laboratory of the Centre for Diabetes Research at the WAIMR.

Benevolent Funding

The AFDR is pleased to advise that a recent funding application, combined with CSIRO, to the *Rebecca Cooper Medical Research Foundation* for equipment support has been

successful. Funds will be used to assist in implementing the Australia Diabetes Therapy Project and will be presented to the project team at the Foundation's annual gala dinner in March. The

Foundation has a long history of providing support to Dr Tuch and colleagues at the former DTU and it is pleasing to note that this support for the AFDR continues. Also of assistance has been the

Lions Club at Bondi, which has provided funds to purchase equipment in the encapsulation of cells.

The AFDR wishes to thank both these organisations for their continued support.

International recognition



R to L: Prof Alan Trounson and Dr Bernie Tuch at the Workshop on Therapeutic Cloning in San Francisco

Former director of the AFDR, Dr Bernie Tuch, was invited to speak at 4 international events last year, in San Francisco, Chicago, London and

Seoul. The events were sponsored by the Californian Institute of Regenerative and the British Medical Research Council, University of Illinois at Chicago, UK Stem Cell Bank and the 11th Immunology of Diabetes Congress respectively. The data he presented was on the use of stem cells and their clinical application.

These invitations followed the publication regarding

a first-in-man clinical trial he and colleagues had carried out in the DTU with human islets placed inside microcapsules. That trial showed the use of capsules in humans was safe, but optimisation was required to improve on the functioning of the encapsulated cells once transplanted.

The details of this trial were published in the clinical journal of the American Diabetes Ass-

ociation, *Diabetes Care*, and publicised in *The Sydney Morning Herald*.



The first recipient of encapsulated human islets, Janice Stewart, immediately before the procedure