



382 Million Have It!

- There are at least 382 million people in the world with diabetes, of whom ≥ 1.2 million are Australians
- 347,000 Australians administer insulin daily
- The annual health care cost for insulin dependent diabetes in Australia is \$1.9 billion

AFDR is committed to developing a cell based therapy to replace the need for insulin injections.

If you would like to contribute to this vital research please fill in the form attached. All donations over \$2 are tax deductible.

Note our new website: www.afdr.org.au

Lions Club Lugarno



Former president of Lions Lugarno Elvio Munzone shaking hands with PhD student Luke Carroll after he spoke about his research at a branch meeting of the Club in August.

The Lions Club of Lugarno has been of major assistance to the Australian Foundation for Diabetes Research (AFDR) this year. Through the good services of its former President Elvio Munzone and fellow Club members he has raised funds to help the AFDR provide a PhD Scholarship. The recipient is Luke Carroll, who is differentiating human embryonic stem cells towards insulin-producing cells, as part of the Diabetes Therapy Project. In August 2014, Luke and his supervisor Professor Bernie Tuch went to a meeting of the Lions Club at Lugarno and spoke to its members about the Project.

We are grateful to Elvio and his colleagues who raised funds from the public at the Roselands

Shopping Mall for this Scholarship.

University of Sydney

The AFDR is forging a relationship with the University of Sydney to allow the Diabetes Therapy Project, previously conducted at CSIRO, to continue. In June 2014, CSIRO made a decision not to pursue that Project further, as part of budgetary cutbacks. However, it did continue to provide support during the transition period. We are grateful to Professor Keith McLean, Dr Meg Evans and Ms Penny Bean from CSIRO for their assistance. Dr Bernie Tuch, who was the Leader of that Project at CSIRO, was subsequently made an Honorary Professor of The University of Sydney. He is continuing to supervise Luke Carroll, who has now relocated to that University from CSIRO. Luke is located in the Diabetes and Islet Biology Group there, under the co-supervision of its Director, Associate Professor Anand Hardikar.



L to r. A/Professor Anand Hardikar, Professor Bernie Tuch, Dr Mugdha Joglekar and other members of the Diabetes and Islet Biology Group at The University of Sydney.

Also providing assistance is

Dr Michael Morris, who heads the Stem Cell Laboratory located nearby. The AFDR is continuing to explore the transplantation of insulin-producing cells into diabetic recipients, using microcapsules made from alginate, derived from seaweed. To this end it is wishing to create a Research Associate position at The University of Sydney and is in the process of doing so at present.

Japanese visitor



A/Professor Yuji Teramura from the University of Tokyo sightseeing whilst visiting Sydney.

In February 2014, we were graced by the presence of Associate Professor Yuji Teramura from the Department of Bioengineering of The University of Tokyo. He gave a talk at CSIRO to those involved in the Diabetes Therapy Project on the use of nanoparticles to coat the surface of cells in order to reduce the host response to them. CSIRO Scientist Dr Vijay Vaithilingam involved in the Diabetes Project was enthused by the visit and said: "It is visits like this that help build bridges between



people, institutions and countries”.

CSIRO

A strategy Dr Vaithilingam has been examining at CSIRO as a means of reducing the host reaction to encapsulated cells has been co-encapsulation with mesenchymal stem cells. They have anti-inflammatory properties and initial experiments in non-diabetic recipient mice indicated a decreased host response.



Dr Vijay Vaithilingam in the small animal operating room ready to transplant encapsulated cells into diabetic mice.

In 2014, Dr Vaithilingam has been examining whether these encapsulated cells transplanted into diabetic mice also show a beneficial effect. Submission of the results of these experiments to a peer-reviewed journal is anticipated shortly.

Visiting Singapore

In 2002, Dr Muhammad Tani Tabiin was completing his PhD under the supervision of Professor Bernie Tuch and Dr Chris White at the Diabetes Transplant Unit, Prince of



L to r. Dr Muhammad Tabiin and Prof Bernie Tuch in Singapore after discussing the possibility of research collaboration.

Wales Hospital. He has come a long way since, now being the Head of the Biomedical Sciences Division of Exploit Technologies in Singapore.

Professor Tuch was visiting Singapore in March 2014 and took time out to catch possibility of restarting a research relationship was explored, especially in the area of microencapsulation of cells as a therapy for diabetes and other medical disorders.

China Visit

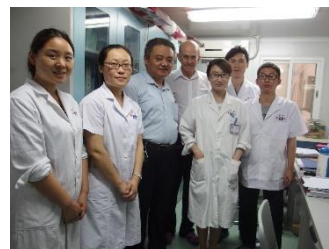
Building bridges with China is encouraged by the Australian Government. CSIRO, which is the Federal Government agency for scientific research, is forging relationships with its equivalent in China, the Chinese Academy of Sciences (CAS). As part of a CAS CSIRO Exchange Scheme, Prof Bernie Tuch visited colleagues in both Shanghai and Guangzhou during May 2014.

He spoke at the Shanghai Institutes of Biological Sciences on the biomaterial challenge of delivering cell therapies, especially as it relates to diabetes. He also held discussions with colleagues, especially the immunologist Professor Xiaoren Zhang, on a collaborative research project underway examining ways of modulating the immune response to biomaterials.



L to r. Dr Qing, PhD student Xi, and Professor Xiaoren Zhang, members of the Shanghai Institutes of Biological Sciences, in the streets of Shanghai.

In Guangdong province, he visited the Guangzhou Institute of Biomedicine and Health and spoke with collaborator Professor Liangxue Lai about possible transplants into diabetic pigs. Professor Lai and colleagues have previously facilitated the transplantation of alginate microcapsules into non-diabetic pigs.



Personnel of Stem Cell Laboratory at Sanjee Hospital, Guangzhou. 3rd from left is Professor Zhou and next to him Professor Tuch.

Thereafter, he met with Professor Qingyan Zhou at the Sanjee Hospital where human fetal neuronal cells are being injected into people who have had strokes. Professor Zhou was interested in isolating precursors of human fetal pancreas as a possible therapy for diabetes.

Research Grant



This Foundation is a benevolent body that provides funds for research equipment, on a competitive basis. Early in 2014 the Foundation advised that an application made for equipment to culture human embryonic stem cells under varying oxygen concentrations had been successful. This equipment will assist Luke Carroll in his project of differentiating human embryonic stem cells towards insulin-producing cells, as it is believed that optimization of the process might be achieved by altering the levels of oxygen the cells are exposed to.



L to r. Professor Bernie Tuch with Dr Tom Cromer, Director of the Rebecca Cooper Medical Research Foundation at the annual Award Presentations.