



### 366 Million Have It!

- There are at least 366 million people around the world that have diabetes
- At least 1.2 million Australians with this disorder
- The number of people with type 1 diabetes is 147,000, many of whom are children
- The annual health care cost for diabetes in Australia is \$1.1 billion
- The annual loss of productivity because of diabetes is \$4.1 billion

We thank the numerous donors of the AFDR for their continuing support.

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### CSIRO Collaboration



*Ms Penny Bean growing human embryonic stem cells in the laboratory. The many flasks are an indication of the large number of cells required for forthcoming animal transplant experiments.*

The collaboration between the Foundation and the CSIRO is bearing fruit. The team, headed by Dr Bernie Tuch, has been working hard this past year to make the use of stem cells as a therapy for type 1 diabetes a reality.

A key strategy has been the differentiation of hu-

man embryonic stem cells to immature insulin-producing cells suitable for transplantation. Ms Penny Bean has spearheaded this step of the Project. Using her many years of tissue culture experience, she has successfully differentiated the Endeavour-1 embryonic stem cells.

These stem cells were created in the former Diabetes Transplant Unit at the Prince of Wales Hospital with funds provided by the Foundation.

The next pre-clinical step in this Australia Diabetes Therapy Project is to transplant the immature insulin-producing cells into animals and demonstrate

the ability of the cells to function.

Dr Tuch, who has 3 decades of experience in transplanting human fetal pancreatic tissue into diabetic recipients, says he is confident this can be achieved.

Also supporting the Project is the Co-operative Research Centre for Polymers. Headed by Dr Ian Dagley, this Centre just had its federal funding renewed for a further 5 years.

Details of the Project have recently been published in the international journal *Diabetes Metabolism Research Reviews*.

### Paper of the Month at University of NSW



*Dr Vijay Vaithilingam at the University of NSW PhD ceremony*

Dr Vijay Vaithilingam received his PhD at the University of New South Wales in December last year, for a thesis entitled *Microencapsulated Human Islets as a Therapy for Type 1 Diabetes*.

The research he carried

out was in conjunction with the Foundation, which supported him for some of his PhD with a Scholarship through the University.

The data from this research has been published in a number of international peer-reviewed journals. The most recent publication was in the August issue of the top rating journal *Biomaterials*.

Vijay and his co-authors received recognition for this publication by the School of Medical Sciences at the University. At a ceremony in October

Vijay received the award of *Paper of the Month* from the School.

Data in the manuscript show that the placement of human islets in microcapsules has very little effect on the genes being expressed in the islets. This means that encapsulation does not have any adverse effect on genetic makeup of the islets maintained within the laboratory.

Vijay is continuing his research in encapsulation, having taken on a post-doctoral fellowship in this area at the CSIRO.



## Partnership with University of Illinois at Chicago

As part of a world-wide effort to replace the need for insulin administration in people with type 1 diabetes, the Foundation has formed a link with researchers at the University of Illinois at Chicago. Both organizations have a similar goal,

The head of the Chicago Diabetes Project is the surgeon, Professor Jose Oberholzer, who likes to run marathons in his "spare time".

That Project has brought together a number of re-

search groups, in Norway, Slovakia, Switzerland, USA and Australia.

By pooling their skills, it is hoped that the delivery of the insulin-producing cells to humans will be perfected. The centre of this strategy is the microcapsule, which is made of alginate derived from seaweed. Cells are placed within the microcapsules, which are then delivered to diabetic recipients.

A problem experienced in the clinical use of these capsules has been the

formation of scar tissue around their surface. Designing a capsule with minimal reactivity once implanted is a main goal of the consortium.

Members of the Project discuss their results by teleconference at least monthly, and meet once or twice a year.

In May, members met in Bratislava, capital of Slovakia, to share their experiences. There they were the guests of the Slovakian Academy of Sciences, with the proceed-

ings hosted by Professor Igor Lacik, head of the Polymer Institute of that Academy. Dr Bernie Tuch was the representative of the Foundation and CSIRO at that meeting.



*R to L: Prof Igor Lacik and Dr Bernie Tuch at the Slovakian Academy of Sciences during a meeting of members of the Chicago Project*

## Change of Directors



*R to L: Directors of the Foundation Dr John Gallo, Mr Stewart Hindmarsh and Professor Geoff Symonds at the recent Annual General Meeting.*

Mr Stewart Hindmarsh, a founding Director of the

Foundation has stepped down from the Executive. This was announced at the Annual General meeting of the Foundation in October. After 10 years of providing very sound judgments, based on his commercial expertise, Stewart will be missed. He leaves to prioritize family commitments, now that his wife has delivered their 3<sup>rd</sup> child.

Taking his place is Professor Geoff Symonds, a senior research scientist with commercial expertise. Geoff previously worked for the company Johnson & Johnson.

There are two other Directors, one of whom took on this role in 2001, when the Foundation was first established. He is Mr Steven

Nemes OAM, a commercial lawyer with the firm Harris Freidman Lawyers in Sydney.

The other is Dr John Gallo, a haematologist who has worked for the NSW Dept of Health. He continues his work in private practice as well as being a counsellor for the organization, Relationships Australia.

## Growing stem cells in Western Australia

During the past year, the collaborative project between the Foundation and the University of Western Australia was successful in producing immature pancreatic cells from an embryonic stem cell line owned by a company in Singapore.

The next step in this Res-

search Project had been to transplant the cells into mice, and investigate the genes that are turned on as the cells differentiate into mature insulin-producing cells.

Unfortunately, the key person within that team, headed by Professor Grant Morahan, has been

unable to continue the project for family reasons.

Plans are afoot, however, to continue the research effort by providing the WA group with immature pancreatic cells differentiated from embryonic stem cells at the CSIRO in Sydney. These will be both prior to and at different time

points after being transplanted into mice.

It is hoped eventually to discover the biochemical pathways by which beta cell maturation occurs. This may eventually allow the formation of clinically useful mature insulin-producing cells within the laboratory.