



Reporting recently to the Fund's Trustees IBR Director, Professor Nick Hunt expressed his gratitude for the seed funding provided to establish the position of the Molecular Biology Officer whose role has been pivotal to the success of this facility, which in turn has enabled the IBR Executive to find funds from other sources to maintain and expand this position and to establish a further MBF. He also reported that the MBF and its dedicated officer had formed the model for other multi-user facilities in the IBR such as the Microscopy Facility and the newly established Cytometry Facility in which the dedicated officer, again supported by the Fund will play a vital role enhancing the IBR's research capabilities.

Other Fund Initiatives

• SZCUF ACADEMIC EXCHANGE PROGRAM

Professor Yom Tov Assis from the International Centre for Jewish Civilisation (ICJC) at the Hebrew University of Jerusalem will visit the Department of Hebrew, Biblical & Jewish Studies at the University of Sydney for a second time with the Fund's support. He will spend a month teaching and consulting during Semester II 2006 to follow-up on projects commenced during his earlier visit in 2000.

During Professor Assis' first visit the ground work was laid for the ICJC to become the benchmarking partner for the Department in evaluating the quality of its work, as required by the Commonwealth Government for all university teaching. Professor Assis' forthcoming visit will provide invaluable input into quality assurance reports regarding teaching of Classical Hebrew and Jewish Civilisation, areas where Professor Assis' expertise will greatly benefit the Department.

In addition, the visit will provide an opportunity for students of the Department to again experience the teaching of Professor Assis which on his previous visit was described as making an outstanding contribution. One student in an evaluation wrote, "We were extremely stimulated by his ability to bring alive a period of Jewish history which we knew so little about and to give it a relevance in today's world. We want him back! "

• SZCUF STUDENT EXCHANGE PROGRAM

Rula Milad a graduate in Human Nutrition from the Hebrew University of Jerusalem spent Semester II 2005 at the University of Sydney, with the Fund's support. With this degree under her belt and also being a certified swimming coach from the Wingate Institute, Rula was keen to focus on a combination of her 2 passions, nutrition and exercise, as offered at the University's School of Sport Science and Exercise in the Faculty of Health Sciences.

Reflecting on subjects studied here, Rula reported that she gained the greatest benefit from the study of Kinesiology and Exercise Rehabilitation. "Kinesiology deals with the science of movement. This class," Rula wrote, "has enabled me to understand the workings of the human body on a very basic level which will greatly enhance my problem-solving skills in treating problems of human movement. The opportunity to work on cadavers in this subject, while it still makes me feel squeamish to think about it, was of enormous value to gaining this deeper understanding."



Rula Milad

By contrast, Rula valued the course in Exercise Rehabilitation for its everyday practicality . "The knowledge I gained from this subject is very relevant to the day to day work I look forward to doing with patients. It dealt with different types of diseases and the relevant exercises in combination with nutrition to help in rehabilitation and prevention with the potential to minimize the quantity of medications the person takes and to enhance their quality of life," she said.

Rula also expressed her appreciation of the lecturers she encountered in the Faculty of Health Sciences. She said their enthusiasm for their subject, their research and their encouragement to the students was truly inspiring. In addition, their generosity with their time and their genuine willingness to help students went way beyond anything she might have expected

"This opportunity of studying at Sydney University was amazing" she concluded. " I met great people and had great experiences and I have learned a lot. This combination of nutrition and exercise sciences I studied gives me a wider perspective on options for treating disease. It is something special I will be able to offer patients in a combination that sadly is not available in Israel. I also know that in my future, I will continue to draw from the deeper and wider, perspectives, knowledge and experiences that I gained while in Sydney."

Cystic Fibrosis Researcher awarded Inaugural Sir Zelman Cowen Universities Fund Prize for Medical Research



Mark Elkins

In March 2006 the Fund was pleased to announce the inaugural award of this prestigious new research award, established in 2005 to recognise the work of young scientists.

To be presented in alternate years at the University of Sydney and the Hebrew University of Jerusalem, the **Sir Zelman Cowen Universities Fund Prize for Discovery in Medical Research**, recognises discovery in medical research by a researcher under 40 years of age working at the University of Sydney or the Hebrew University of Jerusalem.

The inaugural recipient of the Prize is University of Sydney PhD student, Mark Elkins, who has won the award for his work on a ground-breaking treatment for cystic fibrosis sufferers.

The new therapy is simple - inhaling hypertonic saline solution through a nebuliser - but it reduces the recurring complications of the disease, improving the quality and duration of life. Mark's successful coordination of a national, long-term, randomised trial - involving 16 tertiary hospitals and 164 patients - has confirmed that the treatment works and offers hope of a better quality of life for patients.

"The results of our trial were revolutionary," said Mark outlining his work." We saw a 5 per cent improvement in lung function, a major reduction in the number of acute lung flare-ups and therefore fewer antibiotics needed to treat them, and fewer days off from school or work due to illness."

Details of the trial have recently been published in the prestigious *New England Journal of Medicine*.

Cystic fibrosis is a life-impairing, genetically inherited disease that usually is diagnosed at birth or during childhood. It is difficult to treat as it attacks many of the body's vital organs, including the respiratory system. In order to maximise the quality and quantity of life for people with cystic fibrosis, many of the treatments are aimed at the respiratory system. "Although it affects multiple body organs, the lungs are almost always the worst affected," said Mark. "Patients die early, and 95 per cent of the time it's due to respiratory failure because the lungs get overwhelmed by the disease. This new treatment directly works on clearing the mucus from the lungs."

Mark developed an interest in cystic fibrosis through his work as a physiotherapist, with the majority of his clinical case-load involving cystic fibrosis patients.

Cystic fibrosis used to be considered a paediatric disease, which claimed the sufferer in childhood. Now, the average age at death has risen to around 30, thanks to improvements in medical treatments. The work of Mark and his colleagues promises still further improvement.

Mark was nominated for the award by Professor Iven Young, from the Department of Respiratory Medicine at Royal Prince Alfred Hospital.

The award, worth \$5,000 will be presented to Mark at a special ceremony later in the year.

2006 nominations for the Award are being called for from scientists at the Hebrew University in Jerusalem where the first award will be presented in 2007.

More information about the Prize can be found on our website www.szucf.org.usyd.edu.au. Click on *Prize*.

Fund shares milestone research findings at *New Insights into the causes of Alzheimer's Disease Function*

Dr Karen Cullen's work on Alzheimer's disease (AD) has been supported by the Fund for many years. The recent publication of her findings in a number of international journals provided an apt juncture for the Fund to share outcomes of her groundbreaking research with supporters and distinguished guests from the University of Sydney at a function in September 2005.



Prof Fred Ehrlich and Mrs Shirley Ehrlich with Fund Trustee Mr Michael Dunkel at the Function

Professor Jonathan Stone, Managing Trustee of the Fund, a distinguished scientist in his own right and a collaborator on this work with Dr Cullen, introduced Dr Cullen's presentation with an overview of the history of current understandings of AD and the possible need to reorient this view in light of Dr Cullen's findings.

Dr Cullen told the audience that, the dominant hypothesis of AD is that it is caused by build-up of the amyloid protein in lesions called plaques. Hence, the study of amyloid has been the major focus of work on the disease aiming to control it by controlling amyloid.

From her own work on the other hand, Dr Cullen explained she postulates the formation of plaques and 'neurofibrillary tangles' (the skeletons of dead nerve cells) may be late events in a "cascade" of events leading to dementia. Her studies indicate each plaque is the site of a small bleed or micro-haemorrhage the size of a printed 'full stop', or smaller. "The effects of a single micro-stroke are too small to cause symptoms" she said, "but cumulatively their effects are devastating. The nerve cells begin to degenerate from the haemorrhages, eroding cognition bit by bit."

She hypothesises that amyloid build-up is part of this sequence where, following a micro-haemorrhage "clean-up cells" have come in to stop further bleeding, creating scar tissue (the plaque) which in turn cuts off the blood supply to nerve cells, ultimately causing death of ever increasing areas of brain tissue, eventual shrinkage of the brain and loss of cognition.

"Support for this view" she said, "may be found in the fact that a plaque contains more than 100 components, not just amyloid. Each plaque is situated on a microvessel, one of the fine capillaries distributing blood to nerve cells. Inflammation, another common characteristic in AD-affected brains, also focuses on microvessels and contains 'clean-up cells' found at sites of injury, rallying to prevent further damage. Moreover, also present in every plaque is the iron-rich substance *haem*, an indicator of bleeding."

Concluding her talk Dr Cullen said, "With this evidence in hand, though debate rages around triggers for the disease, the tangible benefits to pursuing studies on microvascular causes of the disease have become much clearer. Firstly, it would support risk-reduction strategies for the disease with a clear mechanism. Many of these strategies are already in place for improving cardiovascular health, such as anti-hypertensive medication and lifestyle and diet modification. Secondly, studying the causes of the microvascular break-down provide a gateway into attacking the disease before degeneration begins."

Dr Cullen's next studies, supported by the Fund, and to be done in collaboration with Australian and Israeli scientists, will address these issues.



Prof Stone & Dr Cullen taking questions from the floor

Summing up at the end of Dr Cullen's presentation Professor Stone said, "It can be difficult for a relatively small fund to make a difference to medical research. But, we are confident that Dr Cullen's findings will change how we understand and respond to the dementias. The good news is clear: protection against dementia is already happening, for people taking NSAIDs or statins, usually for other reasons. This protection deserves to be better known. Drugs that protect blood vessels delay and prevent heart attacks, and peripheral vascular disease; and they delay and prevent Alzheimer-like dementias."

Dr Cullen's work featured in ABC TV's *Catalyst* program on 6/4/06. Prof Stone's talk was also presented on ABC Radio National's *Ockham's Razor* on 17/9/05. For more information about these programs and talks visit our website www.szcu.org.usyd.edu.au. Click on *Presentations*.

From Test Tube to Treatment – Updates from latest research on major health issues

In conjunction with the Institute for Biomedical Research (IBR) at the University of Sydney, the Fund was pleased to host a seminar morning in November 2005 focused on a number of health issues of significant interest to us all.

Four eminent scientists from the IBR presented the following program:

Osteoporosis

Vitamin D: the sunshine Vitamin

Presenter: Associate Professor Rebecca Mason, Head, Dept of Physiology & Skin & Bone Laboratory

Cataract

Moving toward non-surgical treatment

Presenter: Dr Frank Lovicu, Senior Lecturer, Dept of Anatomy & Histology, Head, Lens Research Laboratory

Hypertension

The role of the brain in hypertension

Presenter: Professor Roger Dampney, Professor of Physiology, & Head, Cardiovascular Neuroscience Laboratory, Dept of Physiology

Brain Banks

The role of brain banks in medical research

Presenter: Professor Clive Harper, Professor of Neuropathology, Dept of Pathology, Director, NSW Tissue Resource Centre



IBR Director, Prof Nick Hunt

The morning provided valuable health information based on latest research as well as an opportunity for our supporters to hear about some of the research their generosity is supporting and to meet the people carrying out this invaluable work.

The importance of our supporters to this work was highlighted by Prof Nick Hunt Director of the IBR in his closing remarks, "20 years ago, this University received 80% of its funding for teaching and research in

direct grants from the Federal Government. In 2005 the University received only 16% of funds in that way. Additional funds were obtained from government, by competitive application, though typically such applications have only a 1 in 5 success rate."

Hence it was pleasing to meet so many of our supporters at this function and to have an opportunity to reciprocate their generosity.

We look forward to providing further invitations to similar events again this year.

More information about the seminars can be found on our website www.szcu.org.usyd.edu.au. Click on *Presentations*.

IBR Project Report Fund continues support to IBR

Since June 2001 the Fund has provided significant support to the **Institute for Biomedical Research (IBR)** at the University of Sydney. This has assisted in the establishment of the Molecular Biology Facility (MBF) providing state-of-the-art molecular biology technology for scientists of the IBR. A recent decision of the Trustees to support a Flow Cytometry Officer, will continue this association for a further 3 years.

In its simplest terms, cytometry is *the counting of cells*. A high proportion of biomedical research depends on evaluating the numbers and/or functions of the different cell types that make up the human body. Traditional methods of cytometry are based on microscopy and may involve the painstaking work of literally counting cells dyed in particular ways to distinguish them from others. Flow cytometry however, utilises fluorescence to allow analysis of multiple parameters and the counting of cells of very low frequency within mixtures of other cells

In 2004 the IBR, obtained funds to purchase the technically most advanced flow cytometry equipment available. One of these pieces of equipment, the Amnis ImageStream 100 has the added ability to provide actual photographic images of what is going on inside the cells being counted or sorted and will be the first one of its kind in Australia. This will provide an enormous boost to cutting edge research in the IBR.

A Cytometry Officer to properly maintain, upgrade and train others in the use of this highly sophisticated and valuable equipment will optimise its use, expand the horizons of its applications and help to overcome the limitations of such sophisticated equipment and having it housed in a multi-user facility.