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**The Authority for Research and Development**  
 The Hebrew University of Jerusalem

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# SIR ZELMAN COWEN UNIVERSITIES FUND PRIZE



SIR ZELMAN COWEN UNIVERSITIES FUND



THE UNIVERSITY OF SYDNEY

תשע"ה 2015

FOR DISCOVERY IN MEDICAL RESEARCH



האוניברסיטה העברית בירושלים  
 THE HEBREW UNIVERSITY OF JERUSALEM

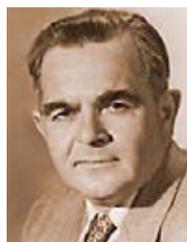


## The Fund

**The Sir Zelman Cowen Universities Fund** was established in 1978 to raise funds for medical & scientific research and to lay the foundation for cooperative work between the University of Sydney and the Hebrew University of Jerusalem for the mutual benefit of both institutions. It is located at the historic Anderson Stuart Building, the original home of Australia's first Medical School. All grants made by the Fund are disbursed to the University of Sydney for projects nominated by the Fund's trustees at both Universities.

Since 1978 the **Fund** has provided millions of dollars for the support of medical research in a wide range of disciplines - the development of cultured skin for the treatment of burns and infection, the management of maturity onset diabetes, the control of pulmonary blood flow, fundamental research into the function of the heart and central nervous system, the molecular biology of AIDS and of other infectious diseases, and the study and early diagnosis of Alzheimer's disease. Since 2000, the Fund has also supported a program of academic and student exchange between the two Universities which is funded by a special donation from the John Hammond Trust. In addition, the Fund has provided support to the Orion Center at the Hebrew University, the Bosch Institute at the University of Sydney and it established the Fund Prize in 2006.

## The Founder



**Mr John Hammond**, a Sydney businessman, established the Fund in 1978. It was his view, and part of his vision for the Fund, that the development of therapies for still-incurable diseases required fundamental research. Projects supported by the Fund have reflected this view.

In recognition of his tireless fund-raising efforts, Mr Hammond was presented with an Honorary Fellowship by the Hebrew University in 1981 and an Honorary Doctorate in 1991 and was made an Honorary Fellow of the University of Sydney in 1993. He was also appointed Honorary Life President of the NSW Friends of the Hebrew University in 1980 in honour of his work for that organisation.

Mr Hammond remained a trustee of the Fund until shortly before his death in 1997 and was a most generous benefactor of the Fund.

## Sir Zelman Cowen



**Sir Zelman Cowen** had recently been appointed Governor General of Australia when the Fund was established. To honour this appointment and because of his long established links with both the University of Sydney and the Hebrew University of Jerusalem, the trustees approached Sir Zelman to allow his name to be used in naming the Fund.

Since that time, Sir Zelman served the Fund as a trustee (1992-1997) and thereafter provided warm support as Patron of the Fund till his death in December 2011.

## The Trustees

The Fund operates under the guidance of its four trustees, two representing the University of Sydney and two the Hebrew University of Jerusalem.

### Representing the University of Sydney:



**Prof Jonathan Stone**, Managing Trustee, Professor of Retinal and Cerebral Neurobiology, Director Bosch Institute and Challis Professor of Anatomy (1987-2003) at the University of Sydney.

Prof Stone's awards for contributions to scientific research include a Centenary Medal for services to Australian society and science in developmental biology and the Ludwig von Sallman Medal for Vision Research awarded by the International Society for Eye Research. Prof Stone is also a Fellow of the Australian Academy of Science.



**Prof David Celermajer**, Scandrett Professor of Cardiology, University of Sydney; Director of Echocardiography and Clinical Academic Cardiologist, Royal Prince Alfred Hospital Sydney; Clinical Director and Group Leader, Clinical Research, The Heart Research Institute and Cardiologist at the Children's Hospital, Westmead, Sydney.

Prof Celermajer's many awards and prizes for outstanding contributions in his field include the *Commonwealth Health Minister's Award For Excellence In Health And Medical Research*, "for outstanding lifetime achievement in health research". Prof Celermajer is a Fellow of the Australian Academy of Science and a past Rhodes Scholar.

In the 2014 Australia Day Honours Awards, Prof Celermajer was awarded an AO for distinguished service to medicine in the field of cardiology and to the promotion of heart health, particularly in children and young adults.

### Representing the Hebrew University of Jerusalem:



**Mr Michael Dunkel**, lawyer, President of the New South Wales Friends of the Hebrew University, member of the Hebrew University Board of Governors.

Mr Dunkel is also a governor of the Orion Foundation which he helped establish to fund various causes and projects including the Orion Center for the Study of the Dead Sea Scrolls.

In 2005, Mr Dunkel became an Honorary Fellow of the Hebrew University and in 2007 the Hebrew University awarded him an Honorary Doctorate in recognition of his services.



**Mr Robert Simons OAM**, engineer and businessman, President of the Australian Friends of the Hebrew University, a past President of the NSW Friends of the Hebrew University, a member of the Hebrew University's Board of Governors and a member of the Hebrew University's Executive Committee.

Mr Simons is also a tireless worker for a number of other Jewish communal organizations.

His role in the Jewish community, and in particular his contribution to education, was recognised by the award of an Order of Australia Medal (OAM) in the 2007 Australia Day Awards.

## Sir Zelman Cowen Universities Fund Prize For Discovery In Medical Research

*Awarded in alternate years at the University of Sydney and at the Hebrew University, the Prize recognizes discovery in medical research carried out at either university by a scientist under 45 years of age.*

It comprises an award of AUSS\$10,000 and a medal crafted by Melbourne sculptor, Michael Meszaros. It is awarded for a discovery which has made a major contribution to the understanding or treatment of disease and has achieved or has the potential to achieve, therapeutic outcomes.

The Prize was established in November 2004 in honour of the Fund's Patron, Sir Zelman Cowen who served as Governor General of Australia from 1977-1982. It was established by a special donation from the John Hammond Trust.



**Dr Mark Elkins**, a Sydney physiotherapist and (at the time) a doctoral candidate, in the Faculty of Medicine at the University of Sydney, was the inaugural recipient of the award, for a groundbreaking treatment for cystic-fibrosis. The award was made in 2006, in Sydney.



**Professor Nir Friedman**, School of Engineering and Computer Sciences, Hebrew University of Jerusalem received the first award of the Prize at the Hebrew University for his pioneering work in the field of bioinformatics. The award was presented in Jerusalem in 2007.

Sir Zelman Cowen Universities Fund Prize  
For Discovery In Medical Research

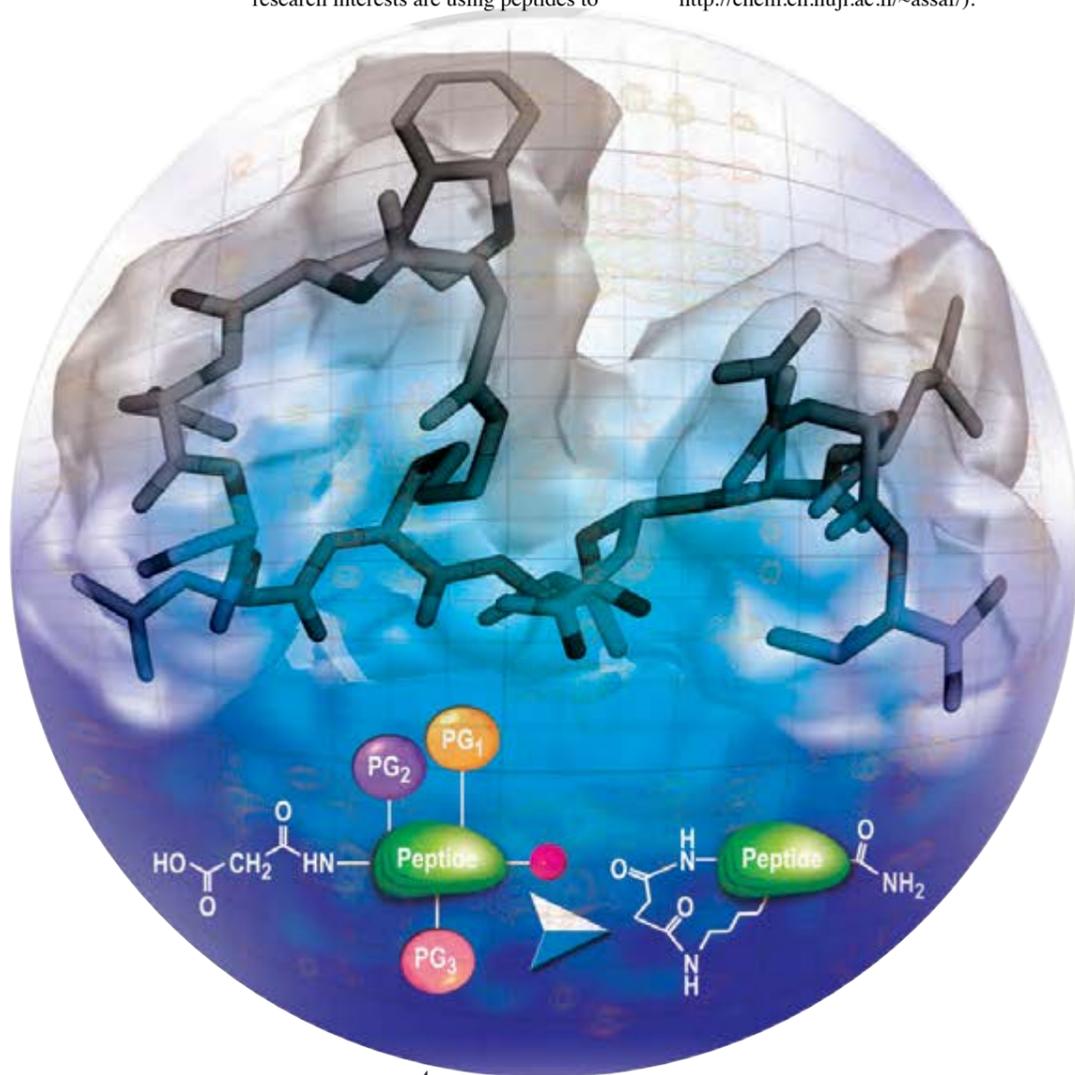


## Professor Assaf Friedler

### Protein Interactions as Targets for Drug Design

Assaf Friedler was born in Haifa in 1971. He received his PhD in peptide chemistry and medicinal chemistry from the Hebrew University of Jerusalem in 2000. He was a post-doctoral fellow at the MRC Centre for Protein Engineering, Cambridge, UK (2000-2004), in the field of biophysical studies of protein-protein interactions. In 2004, he joined the Institute of Chemistry at the Hebrew University and since 2010, is Associate Professor of Chemistry and head of its School of Chemistry. His major research interests are using peptides to

study protein-protein interactions in health and disease; developing peptides as drugs that modulate these interactions; developing new methods for peptide synthesis and studying the mechanisms of action of disordered proteins and setting them as drug targets. Prof Friedler was awarded a starting grant from the European Research Council, the Outstanding Young Scientist Prize by the Israel Chemical Society and the Rector's Prize for Excellent Researcher and Teacher at the Hebrew University. (See <http://chem.ch.huji.ac.il/~assaf/>).



*Professor Friedler has been awarded the 2015 Sir Zelman Cowen Universities Fund Prize for Medical Research for his extensive and groundbreaking work undertaken in protein interactions as targets for drug design.*

**Prof Assaf Friedler's research** deals with the fundamental questions of how proteins interact with each other in health and how these interactions are impaired in disease. This serves as a basis for developing new approaches for drug design. To achieve these goals he and his team have developed an interdisciplinary experimental platform at the Hebrew University, combining chemistry, biophysics and biology. The major achievements of this approach are two novel approaches for drug design that significantly expand the scope of potential drug targets and can be applied to a large variety of disease-related proteins. These approaches are:

#### 1. Using peptides to modulate the oligomeric state of proteins for therapeutic purposes

Many disease-related proteins are in equilibrium between active and oligomeric states, which means that the number of identical protein subunits bound to each other determines the function of the protein. When the correct number of subunits is bound, the protein is active, while when an incorrect number is bound the protein is inactive.

Prof Friedler and his team have shown that specific binding of peptides to one of the oligomeric states of such proteins (a specific number of protein subunits) results in stabilization of this state and consequently in a shift of the oligomerization equilibrium towards it, fixing the protein in this number of subunits. Peptides with such activity are referred to as "shiftides," and they can be utilized therapeutically in two ways: (i) inhibiting a protein by shiftides that bind preferentially to

its inactive oligomeric state (wrong number of subunits) and stabilize it; (ii) activating a protein by shiftides that bind preferentially to the active oligomeric state (correct number of subunits) and stabilize it.

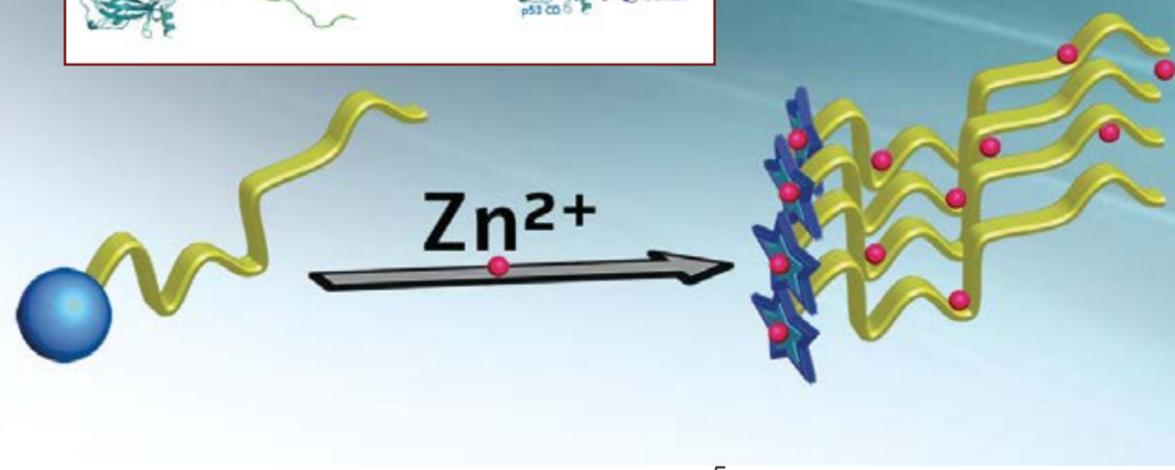
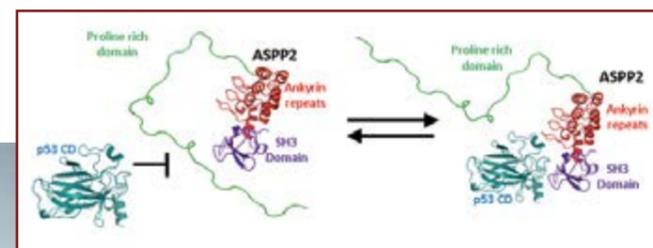
This concept was first successfully demonstrated in the Friedler lab for targeting the HIV-1 integrase protein as a novel approach for anti-AIDS therapy. Since then they have demonstrated its use as a general concept for inhibiting or activating other proteins as well.

#### 2. Intrinsically disordered proteins as drug targets

About two thirds of all proteins are either intrinsically disordered (IDPs) or contain disordered regions (IDRs). They lack stable tertiary structures and are composed of a large ensemble of extended and flexible conformations interchanging dynamically. IDPs are involved in many human diseases, making them attractive targets for drug design. However, more than 90% of current drug targets are enzymes or receptors and IDPs still cannot be targeted due to the lack of specific binding pockets for small molecules.

Prof Friedler's research focuses on how intrinsic protein disorder regulates protein activity with the ultimate goal of setting IDPs and IDRs as therapeutic targets. The team has shown that IDPs can be set as potential drug targets, as demonstrated for (1) the pro-apoptotic ASPP2 protein; (2) the HIV-1 Rev protein; (3) the centrosomal STIL protein, which is upregulated in cancer.

Both concepts are widely applicable for disease-related proteins and will significantly expand the druggable genome, resulting in better medications for the future.



Sir Zelman Cowen Universities Fund Prize  
PREVIOUS WINNERS  
The University of Sydney



**2014 Award – shared**

**Associate Professor Anthony Gill, Sydney Medical School, University of Sydney and Senior Staff Specialist, Dept of Anatomical Pathology Royal North Shore Hospital**

Prof Gill was nominated for his contributions to our understanding of a number of gastrointestinal and renal cancers, including the discovery of hereditary components which some of them have. This has led to the establishment of a low cost, widely available screening program which has resulted in hundreds of individuals with a hereditary cancer syndrome being diagnosed early.



**Associate Professor Ostoja (Steve) Vucic, Sydney Medical School, University of Sydney and Senior Staff Specialist, Dept of Neurology, Westmead Hospital**

Prof Vucic was recognised for his discovery of a unique mechanism underlying amyotrophic lateral sclerosis (ALS), a fatal neurodegenerative disorder. His pioneering research has resulted in a significant advance in understanding ALS and to formulation of novel therapeutic approaches which are in the process of being translated into clinical trials.



**2012 Award**

**Associate Professor Barry Slobedman, Discipline of Infectious Diseases & Immunology, University of Sydney and Centre for Virus Research, Westmead Millennium Institute**

Prof Slobedman was nominated for discoveries which have profoundly changed our understanding of how the human cytomegalovirus (HCMV) can persist in a latent state for the life of the human host, despite the presence of a huge anti-viral immune response.



**2010 Award**

**Dr Rachel Codd, Discipline of Pharmacology, Faculty of Medicine, University of Sydney**

Dr Codd was nominated for the development of a range of compounds that may be effective in treating iron overload disease with orally administrable drugs compared with current therapy requiring intravenous infusion.



**2008 Award**

**Dr Catherine Leamey, Discipline of Physiology, School of Medical Sciences, University of Sydney**

Dr Leamey's work was nominated for the identification of a gene, *Ten\_m3*, which is essential for binocular vision and which has been shown to have important implications for the development of therapies for both visual and developmental brain disorders such as autism and mental retardation.



**2006 Award**

**Dr Mark Elkins, Research Physiotherapist at the Royal Prince Alfred Hospital, Sydney who, at the time of the award, was a PhD candidate in the Faculty of Medicine at the University of Sydney.**

Dr Elkins was the inaugural recipient of the award which was presented, in Sydney, August 2006 by the Vice-Chancellor of the University of Sydney, Prof Gavin Brown. Dr Elkins' award-winning research established new, low-cost, long-term therapy for cystic fibrosis through a multi-centre, randomised, clinical trial.

Sir Zelman Cowen Universities Fund Prize  
PREVIOUS WINNERS  
The Hebrew University of Jerusalem



**2013 Award**

**Associate Professor Eran Meshorer, Dept of Genetics, Silberman Institute of Life Sciences, The Hebrew University of Jerusalem**

Prof Meshorer was selected for the award of the 2013 SZCUF Prize for his work on pluripotency which is the ability of embryonic stem cells to both renew themselves making more embryonic stem cells, as well as to differentiate to form the cells needed for other parts of the body, such as skin, bone, muscle etc.



**2011 Award – shared**

**Dr Eli Pikarsky, Hebrew University-Hadassah Medical School, The Hebrew University of Jerusalem**

Dr Pikarsky was nominated for insights gained from his work in complex mouse models, into the pathogenesis of human disease. His work has yielded new understanding of the determinants of malignancy in testicular cancer; of the impact of inflammation on the progress of liver cancer and the regulation of liver regeneration, important in all conditions which damage liver function.



**Associate Professor Sigal Ben-Yehuda, Institute for Medical Research Israel-Canada, Hebrew University-Hadassah Medical School, The Hebrew University of Jerusalem**

Prof Ben-Yehuda, was nominated for her contributions to our understanding of the biology of bacteria. Her discoveries are fundamental for understanding the mechanisms of bacterial resistance to antibiotics. This gives her work great importance for the treatment of infections caused by the growing number of resistant bacteria.



**2009 Award**

**Dr Adi Mizrahi, Department of Neurobiology, Silberman Institute of Life Sciences, The Hebrew University of Jerusalem**

Dr Mizrahi was nominated for his contribution to the understanding of synapse formation (nerve connections) in the central nervous system (CNS), and for the importance of his group's findings for the development of techniques of CNS repair. These new approaches developed by Dr Mizrahi's team are essential steps towards therapies which will allow the regeneration of brain structures from stem cell technology.



**2007 Award**

**Professor Nir Friedman, Benin School of Engineering and Computer Science, The Hebrew University of Jerusalem**

Prof Friedman was nominated for his pioneering work in the field of bioinformatics. He was selected for the award because of the broad application of his work to many fields of medicine. He received the first award of the Prize at the Hebrew University of Jerusalem.

Further information about the work of all Prize-winners can be found by following the links on the Fund's website at [sydney.edu.au/szcuF/prize/announcements.shtml](http://sydney.edu.au/szcuF/prize/announcements.shtml)