Addiction
Alzheimer’s disease
Cardiovascular disease
Depression
Epilepsy
Huntington’s disease
Motor neuron disease
Multiple sclerosis
Parkinson’s disease
Schizophrenia
Stroke
Traumatic brain and spinal cord injury
Our Mission
Improving life through brain research

Our Vision
To be recognised as a leading international brain research institute

Our Values
Innovation and Excellence
Commitment and passion
Integrity and rigour
Collaboration and teamwork
1 in 7 Australians experiences a major brain disorder every year
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chairman’s report</td>
<td>4</td>
</tr>
<tr>
<td>Director’s report</td>
<td>6</td>
</tr>
<tr>
<td>COO’s report</td>
<td>8</td>
</tr>
<tr>
<td>Foundation Chairman’s report</td>
<td>11</td>
</tr>
<tr>
<td>Board of Directors</td>
<td>14</td>
</tr>
<tr>
<td>Division Heads</td>
<td>22</td>
</tr>
<tr>
<td>Behavioural Neuroscience</td>
<td>34</td>
</tr>
<tr>
<td>Brain Development and Regeneration</td>
<td>36</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>38</td>
</tr>
<tr>
<td>Genomic Disorders Research Centre</td>
<td>40</td>
</tr>
<tr>
<td>Imaging</td>
<td>42</td>
</tr>
<tr>
<td>Multiple Sclerosis</td>
<td>44</td>
</tr>
<tr>
<td>Neurodegeneration</td>
<td>46</td>
</tr>
<tr>
<td>Neuropeptides</td>
<td>48</td>
</tr>
<tr>
<td>Stroke</td>
<td>49</td>
</tr>
<tr>
<td>Systems Neurophysiology</td>
<td>52</td>
</tr>
<tr>
<td>Research Platforms – Clinical Trials,</td>
<td>54</td>
</tr>
<tr>
<td>NeuroResearch Services, Statistics &amp; Informatics</td>
<td></td>
</tr>
<tr>
<td>Commercialisation</td>
<td>58</td>
</tr>
<tr>
<td>FNI Governors</td>
<td>60</td>
</tr>
<tr>
<td>Members at Large</td>
<td>61</td>
</tr>
<tr>
<td>Composition of Board Committees</td>
<td>62</td>
</tr>
<tr>
<td>Donors</td>
<td>64</td>
</tr>
<tr>
<td>Financial statements</td>
<td>68</td>
</tr>
</tbody>
</table>
CHAIRMAN’S REPORT

The combination of new construction, the merging of systems and collaboration in science, is fostering a shared identity at Florey Neuroscience Institutes (FNI). Three and a half years into the five year amalgamation process, a Florey personality and spirit is gaining strength.

Our scientists are excited by the prospect of moving into new laboratories, and the scientific potential at their grasp.

The Global Financial Crisis has impacted FNI both positively through the very competitive prices from excellent contractors for our new buildings but negatively through the more difficult fundraising environment. As we expand into the new buildings this will probably be the major challenge for the Board and management over the coming few years whilst we strive to continue to produce outstanding science.

Our Science

Through 2010, Professor Donnan continued to streamline the Florey’s scientific model. The divisions were restructured to nine in number and three scientific platforms were introduced. The platforms provide services to the internal and external clients of the Institutes. These services include statistical and information support and modelling for research projects, MR imaging services and behavioural testing.

Pursuing the scientific vision of 2009, Professor Donnan and senior members of the scientific team initiated contact with a number of overseas based scientists that FNI were keen to attract to Australia. These meetings have been fruitful and in 2011 a number of highly respected researchers, some with teams, will join us at FNI.

One such outstanding researcher we attracted in 2010 was Professor Neil Levy. Professor Levy holds a joint position with the University of Oxford and specialises in neuroethics, the philosophical discussion about the ethics of neuroscience and the neuroscience of ethical behaviour.

A significant contribution in 2010 came from our epilepsy team which with The University of Melbourne and collaborators in South Australia and Queensland won the single largest National Health and Medical Research Council (NHMRC) Program Grant for the year. $16.45m will go towards research into the genetic causes of epilepsy and how genetic variations result in the development of seizures.
The Melbourne Brain Centre

To provide an immediately recognisable identity to the shared research facilities the partners in the project have agreed to the simple and descriptive name ‘Melbourne Brain Centre’. The name will cover both campuses at Parkville and Austin and will be represented by a simple graphic, which will be unveiled in 2011.

Construction of the Austin campus was completed in 2010, with it being made ready for occupation in late February 2011. The new laboratory, office and meeting spaces are stunning. The building seems to be connected to its surroundings, taking advantage of the wonderful views in a functional but relaxed way. It reflects the character of research in Australia.

The Parkville complex, is well ahead of time and budget and is due for completion by mid-2011. Even though it is not yet complete, it is obvious the building makes a strong architectural statement. It is an imposing and modern structure and reflects the thoroughly inspired research our scientists undertake.

Collaboration

The Florey has always had a close relationship with The University of Melbourne, but in 2010 proposed changes that threatened the Federal funding of research institutes in Australia meant that it was favourable for us to collaborate more closely than ever before. We initiated discussions at Board level that would bring FNI closer to the University, but would retain the Institutes’ independent Board, funding and staff.

Through the development of the Melbourne Brain Centre the synergies between FNI and the Mental Health Research Institute (MHRI) have become apparent. Towards the end of 2010, FNI and MHRI agreed to explore a closer working relationship, which was warmly welcomed by the Boards of both organisations.

Financial support

As mentioned briefly, the Global Financial Crisis continued to have an impact on FNI’s financial situation. Philanthropic trusts which contribute substantially to the Institutes’ operation had much of their capital eroded over the period, which impacted on their capacity to provide grants.

Personal giving by donors to the Florey was up in 2010 and our success in the competitive NHMRC and ARC grant rounds was also impressive. Again the Florey is up, year on year.

Without the generous support of our private, government and institutional supporters the good work of FNI would not be able to proceed. I would like to thank them all on behalf of the Board.

Board matters

During the year we have been very sorry to lose the services of Mr Allan Myers AO and Mr Harrison Young.

Mr Allan Myers has helped steer FNI through the amalgamation process. He is arguably one of Australia’s best legal minds and has served the Board and the organisation diligently for a number of years. We will miss his contribution and wisdom. Allan’s leadership has also been most evident in that he has been a significant donor to FNI.

Mr Harrison Young drove the formation of the FNI Foundation and was its Chairman from 2009 until retirement. Harrison provided excellent advice to the FNI Board and was passionate about building an endowment that would guarantee the organisation’s financial security and expansion into the future. Harrison led by example and is a major financial donor to FNI.

Through 2010 we have been very fortunate to have some outstanding Directors join the Board. Mr Andrew Abercrombie, a Founding Director of FlexiGroup Limited, Professor Anne Kelso AO, Director of the WHO Collaborating Centre for Reference and Research on Influenza at Melbourne Health and Mr Stephen Spargo, a senior lawyer practising in financial services and projects and a partner of Allens Arthur Robinson since 1983.

FNI has grown through 2010, with increased staff numbers and expansion plans for the future. The development of our new facilities and the increase in our scientific output is rewarding and also challenging, and I would like to thank all of our staff for their enormous contribution. 2011 will see the completion of the buildings, a mass move of staff and the recruitment of more scientific teams. It will be a great year; our staff are excited and ready for the move.

Charles Allen AO
Chairman

Charles Allen AO
During 2010 we have overseen the near completion of three major building initiatives. This capital works program represents the single greatest expansion in the history of the Florey and provides the best platform for our scientists to fulfil their potential and make new discoveries.

**Our Buildings**

During 2010 we have overseen the near completion of three major building initiatives. The largest of these, our new Parkville building, which can be seen rising to its full height at its Royal Parade address, will be completed in May 2011. Our Austin facility at Heidelberg will be completed in January 2011. Together with our partners Melbourne Health, The University of Melbourne and The Mental Health Research Institute we will also complete a new translational research facility on the fourth floor of the Royal Melbourne Hospital in April 2011. This capital works program represents the single greatest expansion in the history of the Florey and provides the best platform for our scientists to fulfil their potential and make new discoveries. When put in the context of other buildings occurring in the Melbourne and Austin precincts, almost $2 billion in capital infrastructure will be expended over a 10 year period. These are truly exciting times for science in Melbourne.

**Our Science**

To complement our capital investment there is a real need to continue to support our science by winning grants through the highly competitive National Health and Medical Research Council (NHMRC) and Australian Research Council (ARC) process. Fortunately, our competitive research income has increased by nearly 13 per cent to $17 million this year. Among these was a Clinical Research Excellence grant to help staff establish our translational research facility at the Royal Melbourne Hospital led by Prof Stephen Davis, and a CSIRO Flagship grant for translational research in stroke. Equipment for our building program has been supplemented by a Victorian
Science Agenda grant to help fund our human Magnetic Resonance Imaging (MRI) facility on the Austin Campus and our animal MR facility in Parkville. In collaboration with the University of Melbourne as lead agent, we were fortunate to obtain a grant from the Education Initiative Fund to help support our 7 tesla human MRI facility in Parkville.

A number of our scientists have distinguished themselves throughout the year with awards recognising the high quality of their science. Some of these include: Prof Phil Beart (Bethlehem Griffiths Research Foundation Medal), Dr Bradley Turner (Inaugural Bethlehem Griffiths Research Foundation Prize), Prof John Wade (Cathay Award, the highest honour given by the Chinese Peptide Society), Dr Radwa Badawy (University of Melbourne Chancellor’s Prize for Excellence in a PhD Thesis), Dr Clare Parish (a finalist in the People’s Choice Award for the Australia Museum Eureka Prize).

Our science recruitment program is well underway with the expected arrival during 2011 of one team and five individual scientists in the fields of epilepsy, brain stem control of breathing, heart and blood pressure, signalling within cells, addiction and stem cells. Hence, the pieces of the jigsaw are coming together, so that during 2011 and 2012 our existing scientists, as well as our new recruits will have an even more exciting collaborative environment within which to work.

Our Collaborations

We are fortunate in being embedded in the two most important organisations of relevance to the biomedical sciences. These are the University of Melbourne and the public health system. For the latter, I have referred to the new translational research facility at the Royal Melbourne Hospital and, of course, our major node at the Austin Hospital. Together with our other important partner, the Mental Health Research Institute, we have all agreed to work under the general umbrella of the newly named Melbourne Brain Centre. This is an important development which allows close collaboration of shared major science platforms such as imaging and IT to maximise our research potential. The benefits of the collaborations have already been evidenced by the winning of large equipment grants mentioned earlier, grants which could never have been possible with organisations acting individually. The expense of high quality science in today’s environment makes it essential for us to maximise these collaborations so that we can be competitive at a global level and solve some of the great science mysteries of our time. Another excellent example of this principle is the recent awarding of a $21m ARC grant to the University of Melbourne to host the Australian stem cell initiative in collaboration with the Florey, Monash University, University of Queensland and the Walter & Eliza Hall Institute. The Melbourne component of this exciting initiative will be housed within Florey Neuroscience Institutes.

Our Staff

During 2010 we finalised our science structure to include an Executive, Division Heads, Laboratory Heads and Faculty. This structure enables us to operate across our multiple buildings and sites in an effective manner so that integration and communication is maximised. Video conferencing facilities between the Austin and Parkville campuses are now a regular feature.

We are also supported by a high quality administrative staff headed by our Chief Operating Officer Gary Gray. Their unflinching support enables the Institutes to run smoothly and efficiently. Giving broader strategic direction is our hard working Board with a number of new members including Professor Anne Kelso, Mr Andrew Abercrombie and Mr Stephen Spargo who have added significantly to the mix of Board skills. Together with our Chairman Mr Charles Allen I thank them all for their support during what has been an exciting and productive year. Retiring members Allan Myers and Harrison Young have been enormous contributors over the years and will remain in close contact with FNI in their role as Governors. I thank them for their support and ongoing commitment.

GEORGE A DOONAN
DIRECTOR
With a blink of an eye 2010 has come and gone. It has been a very busy year, and I am aware that 2011 will be even more challenging. Thus, the administrative team is consolidating the business platforms to support research in our new facilities, jointly occupied by the University of Melbourne and Mental Health Research Institute.

Laying the operational foundations

We invested considerable resources in a consolidated general ledger and common chart of accounts to link FNI subsidiaries the Brain Research Institute, Howard Florey Institute and National Stroke Research Institute. This included an upgrade of system software, staff training across multiple sites, and reorganising tasks and responsibilities. This has increased transparency of accounts, and has better equipped us for external audit.

Concurrently, we have procured an e-learning system to facilitate and embed FNI policy and procedures with growing staff numbers across Parkville and the Austin. A single payroll and human resource management system is planned for implementation during 2011. This will consolidate the two payroll systems we are currently operating, provide online enquiry and management functions, and maintain an electronic record of staff personnel details.

A review of Occupational Health and Safety processes and procedures has been initiated to prepare the organisation for best practice operation in the new facilities. An Austin Campus Occupational Health and Safety Committee was established, and a gap analysis undertaken to facilitate further improvement across all sites.

A Strategic Risk Profile was developed pro bono by KPMG. The process outcomes have enabled the Directors to target matters that impact on FNI’s capacity to deliver on its strategic goals. KPMG will also develop a Compliance Manual during 2011 to help the Board strengthen business continuity. We are very appreciative of the generous help given by KPMG this year, and look forward to our continued collaboration next year.
We acknowledge the Victorian Government’s strong support, particularly through the funding from the Operational Infrastructure Support Grant. All funding received through the Department of Business and Innovation and other Government agencies are expended on our research activities and services to support the science.

**Impact of new facilities on management**

FNI will assume direct responsibility for facility management of the Austin building, involving cleaning, maintenance of building plant and equipment, security and other related matters. External providers will perform these duties and costs will be shared by the co-located partners.

I would like to thank Austin Health for its many years of financial support in what will soon become our old premises at Heidelberg, and for allowing us to progressively accommodate the full financial impact of these new responsibilities.

A new FNI website will go live January 2011. The website will serve multiple purposes and subsequently host an intranet to make accessible to staff all policies, procedures, and internal management forms.

The project partners will jointly operate the information and communication technology within the new facilities and we have established an IT Steering Committee to oversee implementation across all sites. The University of Melbourne will assume responsibility for desk top office, voice and printing services and each agency will assume responsibility for its own scientific and business hardware and software applications.

A Scientific Services Manager has been appointed, with responsibilities spanning the new buildings, existing Howard Florey Building, and others that may be maintained by the Mental Health Research Institute. The incumbent will be responsible for policy development across all sites.

Scientific platforms in the new Parkville facility will be shared, and each platform will be assigned to one of the project partners as lead agent. The lead agent will deliver the platform to all partners against agreed performance indicators, and the cost will be charged to the partner who will pass it on to their respective scientific teams. This management policy required the services of a project accountant who has since been engaged. Developing and finalising Service Level Agreements and agreed unit costs will be a major exercise during the first half of 2011. Asset Management plans for both new facilities are under development.

**The challenge**

The management challenge associated with amalgamation has been substantially increased by operating within a new environment with co-located partners. Many of the business rules have been agreed. Others are still under development. At the same time, changes in infrastructure funding create a new challenge that will unfold during 2011.

FNI’s vision needs a complex management response, and this is supported by the quality of our staff in making things happen. For this I am truly grateful and thank those people who have not only been on the journey so far, but have helped us navigate around obstacles along the way.

GARY GRAY
CHIEF OPERATING OFFICER
Florey Neuroscience Institutes is indebted to the many individuals and organisations that have provided financial and gift-in-kind support during 2010. Each gift is critical as it enables our scientists to move closer to their goal of achieving a healthier future for all Australians.

As Chairman of the FNI Foundation Council, I am pleased to provide this report on our fundraising and marketing activities. In doing so, I thank the Fundraising and Marketing staff for their significant efforts during 2010 and also the members of the Council who have given their time so generously to develop appropriate strategies and procedures to support this work. They are: Mr Andrew Darbyshire, Mr Simon Peck, Mr Nick Terry, Ms Michelle Jablko, Mr Charles Allen AO (Ex officio) and Professor Geoff Donnan.

2010 began with the hope that the downturn experienced from the Global Financial Crisis on FNI’s fundraising results during 2009 would be redressed and a better fundraising year would be the outcome. However, this was not to be, and whilst there have been good results in general fundraising, Trusts and Foundations income, in particular, has continued to suffer from the effects of the financial markets.

During the year general fundraising revenue, excluding capital fundraising, totalled $1,828,912 received from 1,304 organisations, individuals and families.
Bequest development

Income from realised bequests during 2010 amounted to $69,785. This was supplemented by some generous direct gifts from existing bequest donors totalling $16,000. There has been much activity in this area during 2010, with the number of bequest commitments increasing from 32 at the end of 2009 to 50 by the end of this reporting period.

After 18 months as part of our team, our Bequest Officer Helen Whyte retired in December 2010. She commenced in July 2009 at a time when FNI had 22 bequest commitments and leaves us with more than double that number. A sterling effort, indeed. We welcome John Macdonald to the Fundraising and Marketing team and he has taken over where Helen left off.

We appreciate all legacies, as these will ultimately make it possible for the FNI Foundation to build an endowment for FNI’s future scientific pursuits.

Brain Fitness Challenge

After several years of planning, this initiative was developed into an online competition aimed at promoting the work of FNI and raising funds for brain research. The inaugural Brain Fitness Challenge was implemented during November 2010, and 17 organisations registered 54 teams of five people each, working individually and together to solve 49 original cognitive challenges. $57,000 was raised from new sources and FNI was brought to the attention of the corporate sector. It is proposed to build on this initiative and run the Brain Fitness Challenge again in August 2011.

Communicating with our supporters

During 2010 our popular Brain Matter(s) newsletter continued to inform approximately 6,000 supporters and stakeholders about the latest developments in neuroscience, highlighting some of the exciting progress made by FNI in its particular areas of research. Our Annual Report offers more detailed information to our community of supporters, and our Research Report outlines scientific detail of our work to stakeholders in the science sector.

In addition, our community outreach programme, branded under the same Brain Matter(s) theme, delivered ten presentations to community groups such as Probus and U3A. Several FNI scientists participated in this programme, including former Director Professor Fred Mendelsohn who has always been a popular speaker with the community. Fred, now in retirement, indicated that 2010 would be his final year as part of the Brain Matter(s) programme. We are sorry to lose Fred’s participation, however, we wish him well in his retirement activities and thank him for his immensely valuable support of this programme.

The new FNI website neared completion towards the end of 2010. It has been a significant task to bring together the needs of our three subsidiary institutes under the one banner. Current planning is that the new website will be live in mid January 2011.

Community Fundraising

A number of external groups and people arrange their own fundraising activities on behalf of FNI, and we are most appreciative of their support. During 2010, FNI was the grateful recipient of $129,560 from Lina Marrocco and the Charityworks for MS fundraising team, which holds a bi-annual ball to raise funds for MS research. Other community fundraising activities included a substantial gift towards MS research raised by artist Leo de Silva at the opening of his exhibition in Melbourne, and the proceeds of a dinner dance organised by Shepparton resident Bronwen Bray to support our research into Motor Neurone Disease.
Awards and Prizes

We are fortunate to receive the support of a number of people and organisations that provide funding each year for Travel Awards and Prizes for the career development of our PhD students and Postdoctoral Research Fellows. We particularly acknowledge and thank the Browne Family, Andrew and Cathryn Darbyshire, the Goodsite Company, the Harold Mitchell Foundation, Life Technologies, John Milne, Millipore, Olympus and Scientifix.

2010 Kenneth Myer Lecture

The 14th Annual Kenneth Myer Lecture was delivered on Thursday 11 November 2010 by Professor Tim Bliss from the Institute of Cognitive Neuroscience, University College London. Professor Bliss has a special interest in synaptic plasticity, particularly long-term potentiation or how the brain lays down memories. An audience of some 1,500 people gathered at the Melbourne Convention & Exhibition Centre to hear Professor Bliss discuss the Machinery of Memory.

The annual Kenneth Myer Lecture is an important part of our community engagement providing an opportunity for our many supporters to learn more about the mysteries of the brain from world renowned neuroscientists.

Media and Promotion

There was some excellent media coverage of FNI during 2010 with some highly interesting media stories on a range of issues about brain disorders and diseases. One FNI researcher’s involvement in an international study into the genetics of SIDS received national media attention, as did the discovery of a potentially more effective and less risky treatment for stroke. Significant media activity was generated by the launch of a new multi-million dollar project with the CSIRO, which examines biomarkers for stroke and increasing the timeframe for use of clot busting drugs. The Chairman of the CSIRO, Mr Simon McKeon, attended and spoke at the launch and the event was covered nationally by Channel Nine.

In the latter part of the year there were three articles directly promoting the Brain Fitness Challenge that were a quarter page in The Age, a full page feature in the Herald Sun and a double page spread and cover article in the Business Review Weekly.

These are only a few of approximately 280 news stories generated by FNI through the year on a variety of brain and mind health matters.

Our Supporters

In thanking our supporters, we would be remiss if we did not make very special mention of the enormous contributions made to support our work, on a continuous basis, by the Ian Potter Foundation and the Myer Foundation and Family. Their support over many years for the Howard Florey Institute, and latterly for Florey Neuroscience Institutes, has been vital in our progress towards overcoming neurological disease. We must also make special mention of the Besen Family Foundation and The Pratt Foundation for their generous support over several years, particularly for a collaborative research project between Florey Neuroscience Institutes and the Weizmann Institute in Israel. The John T Reid Charitable Trusts have also been generous supporters over the past five years, making a vital contribution to our Neuropeptides Division.

Florey Neuroscience Institutes is indebted to the many individuals and organisations that have provided financial and gift-in-kind support during 2010. Each gift is critical as it enables our scientists to move closer to their goal of achieving a healthier future for all Australians.

STEPHEN SPARGO
FOUNDATION CHAIRMAN
Mr Charles K Allen AO (Chairman)  
MA MSc

Mr Charles Allen was born and educated in England. His working career was in the oil and gas industry. He was Managing Director of Woodside Petroleum in 1982 and retired in 1996. He has been a Director and Chairman of CSIRO, National Australia Bank and Air Liquide Australia. He has also been a Director of Metals Manufactures, Amcor and AGL.

Professor Geoffrey Donnan (FNI Director)  
MBBS MD FRACP FRCP (Edin)

Director of FNI, Professor Geoffrey Donnan was previously Director of the National Stroke Research Institute and Professor of Neurology, University of Melbourne, Austin Hospital campus. His research interest is clinical stroke management and he was co-founder of the Australian Stroke Trials Network. He is immediate Past-President of the World Stroke Organisation. He received the American Stroke Association William Feinberg Award for Excellence in Clinical Stroke Research in 2007 and the 2008 Bethlehem Griffiths Research Foundation Medal for outstanding contributions to research in stroke.

Professor Graeme Jackson (BRI Scientific Director)  
BSc (Hons) MBBS FRACP MD

Professor Graeme Jackson is the founding Director of the Brain Research Institute and a Neurologist at the Austin Hospital. He is internationally recognised for his work in new MR technologies, particularly in the field of epilepsy. He is a Professorial Fellow of the Department of Medicine and Adjunct Professor in the Department of Radiology, University of Melbourne.

Mr Andrew Abercrombie  
BEc, LLB, MBA

Mr Andrew Abercrombie is a Founding Director of FlexiGroup Limited and is a non-executive Director on the FlexiGroup Board as he continues to mentor and advise the CEO and management team. He is a former Chairman of the Melbourne Chapter of Young Presidents’ Association. He continues to be involved with YPO at both a local and international level, including leading study groups at the annual YPO Seminar at Harvard Business School.
Mr Craig Drummond  
B.Comm (Melb), ACA, SFFIN

Mr Craig Drummond is Chief Executive Officer and Country Head of Bank of America Merrill Lynch Australia, and brings with him more than 20 years of banking experience.

He is a fully accredited member of the Securities & Derivatives Industry Association, a Senior Fellow of FIN SIA and is a Chartered Accountant. He is a Director of Scotch College, the Australian Davos Connection and Australian Financial Markets Association (AFMA).

Emeritus Professor Andrea Hull AO  
BA Dip Ed [Univ of Sydney] MBA [MBS, Univ of Melb]; FAICD; FAIM

Professor Andrea Hull has had a distinguished career in CEO and executive roles, and also as a non-executive Board member in government and not-for-profit organisations.

She is an Emeritus Professor at the University of Melbourne, and sits on the Boards of the National Museum of Australia, the National Gallery of Victoria, and the Breast Cancer Network of Australia. Professor Hull has undertaken numerous international and national assignments, and served on many international, federal and state bodies to advance the integration of economic, social and cultural agendas.

Mr Mark Jones  
BA (Hons) (Sheff) MBA (MBS)

Mr Mark Jones is a Partner in KPMG’s Advisory Services practice, with national responsibility for corporate governance and internal risk management. Mr Jones is a Fellow of both the Institute of Chartered Accountants in England and Wales and the Institute of Chartered Accountants in Australia, and is a member of both CPA Australia and the Australian Institute of Company Directors.

Professor Anne Kelso AO  
BSc (Hons) PhD (Melb)

Professor Anne Kelso has been Director of the WHO Collaborating Centre for Reference and Research on Influenza at Melbourne Health. She is also an honorary professorial fellow at the University of Melbourne where she undertakes research on immunity to influenza. She is currently a member of the Council of QUT, the Board of the Telethon Institute for Child Health Research and a number of committees advising the WHO and the Australian Government on influenza.
Emeritus Professor Richard Larkins AO
MBBS, LLD(Hon) PhD (University of London), FTSE,

Professor Richard Larkins is an Emeritus Professor at Monash University, where he was Vice-Chancellor and President from 2003 to 2009. His current roles include President of the National Stroke Foundation, President of Australian University Sport, Chair of the Council of the European Molecular Biology Laboratory, Australia, and Chair of the Incorporated Joint Venture Board for the Parkville Comprehensive Cancer Centre.

Dr Brendan Murphy
MBBS PhD FRACP FAICD

Dr Brendan Murphy was appointed Chief Executive Officer of Austin Health in January 2005. He is currently a member of the Board of Health Workforce Australia, Chair of the Victorian Health Department Management Innovation Council and a Professorial Fellow with the title of Professor at Melbourne University.

Professor Peter Rathjen
BSc (Hons) (Adel) D Phil (Oxon)

Professor Peter Rathjen is currently the Deputy Vice-Chancellor (Research) at the University of Melbourne. Prior to taking up this position, he was Dean of Science at the University of Melbourne from 2006 - 2008. Professor Rathjen was a founding member of the ARC Special Research Centre for the Molecular Genetics of Development, and the Australian Stem Cell Centre (ASSC).

Dr Thomas Schneider
AB magna cum laude with highest honours (Harvard) D Phil (Oxon) JD (Harvard) Hon D Laws (Deakin)

Dr Thomas Schneider is the President and CEO of Restructuring Associates Inc. in Washington, DC, and the Chairman and CEO of Schneider (Australia) Consulting Pty Ltd in Melbourne. He is Of-Counsel to the law firm of O’Connor & Hannan in Washington, DC. Dr Schneider is a Board member of the J. Venter Institute and the American Australian Educational Leadership Foundation.
Mr Stephen Spargo

LLB LLM

Mr Stephen Spargo is a solicitor practising in the financial services and projects department of Allens Arthur Robinson where he has been a partner since 1983. He is a director of Asialink, Asia Society Australasia Centre and The Royal Agricultural Society of Victoria Limited and a member of the Committee of the Melbourne Cricket Club and the Victorian State Council, Committee for the Economic Development of Australia.

Mr Robert Trenberth AM

BEng (Melb) MA Sc (Waterloo, Canada) MBA (Harvard) FAICD

Mr Robert Trenberth began his professional career as a structural engineer and now serves as Chairman and Director in a number of companies and not-for-profit organisations. His corporate business career includes consulting with McKinsey & Company, followed by senior executive appointments with Carlton and United Breweries Ltd and McPherson’s Ltd. His current company appointments include Chairman of Riviera Properties Ltd and of Upstream Print Solutions and Director of the CRC for Polymers. Mr Trenberth’s not-for-profit appointments include Chairman of the Australian Sustainable Industries Research Centre and Vice President and Director of the National Stroke Foundation.
The new laboratory, office and meeting spaces at the Austin Campus of Melbourne Brain Centre are stunning. The building seems to be connected to its surroundings, taking advantage of the wonderful views in a functional but relaxed way. It reflects the character of research in Australia.
Professor Malcolm Horne
Neurodegeneration
BMedSci (Hons), MBBS (Hons), PhD, FRACP

Professor Horne is Deputy Director of Florey Neuroscience Institutes, Consultant Neurologist at St Vincent’s Hospital, Fitzroy, and Conjoint Professor, Centre for Neurosciences at the University of Melbourne. He is a member of The Australian Society for Neurosciences, The Australian Association of Neurologists, The Royal Australasian College of Physicians and The American Society for Neurosciences.

Professor Graeme Jackson
Epilepsy
BSc (Hons) MBBS FRACP MD

Professor Jackson is the founding Director of the Brain Research Institute and a Neurologist at the Austin Hospital. He receives international recognition for his work in new MRI technologies, particularly in the field of epilepsy. He is a Professorial Fellow of the Department of Medicine and Adjunct Professor in the Department of Radiology, University of Melbourne; an Honorary Neurologist at the Royal Children’s Hospital in Melbourne and a Board member of Neurosciences Victoria. Professor Jackson won the highly prestigious 2008 NHMRC Excellence Award.
Professor Alan Connelly  
Imaging  
PhD  

Until August 2005, Professor Connelly was a Professor of Biophysics at University College London, with a particular interest in the development of magnetic resonance techniques and their application to significant clinical and neuroscientific problems. He then relocated with his research group to FNI, where he has been instrumental in setting up new MR facilities at the Austin Campus. His work has covered a range of MR methods, with current focus primarily on diffusion and perfusion MRI and their application to the investigation of epilepsy, stroke, and cognitive function. Professor Connelly has published widely in magnetic resonance, general scientific, and neuroscientific journals.

A/Professor Steven Petrou  
Epilepsy  
BSc(Hons) PhD  

Associate Professor Petrou is an Associate Director and Head of the Florey Neuroscience Institutes' Division of Epilepsy, and heads the Laboratory of Ion Channels and Human Disease, a multidisciplinary team of researchers with a focus on revealing fundamental mechanisms of disease genesis in the central nervous system. Current major areas of investigation centre on the development and characterisation of genetically engineered mice models for the study of human familial epilepsy. He works closely with industry and has several patents for his discoveries. In addition to his many roles within the Florey Neuroscience Institutes and the University of Melbourne, he serves on the editorial board of the Journal Neurobiology of Disease and the Investigators Workshop Committee for the American Epilepsy Society.
Professor Gary Egan
Imaging
BSc (Hons), PhD, MBA

Professor Egan is a NHMRC Principal Research Fellow at FNI and Head of the Neuroimaging and Neuroinformatics Group which includes the animal MR imaging and spectroscopy facility. He is also Associate Director of the Centre for Neuroscience, University of Melbourne and Deputy Director of the NCRIS National Imaging Facility. He has developed in vivo MR imaging and analysis methods using high resolution structural MRI to study cortical lamination patterns, as well as innovative MRI acquisition and analysis techniques for the detection of iron pathologies related to neurodegenerative diseases. He has received substantial national and international recognition for his research, and is currently associate editor of Human Brain Mapping and a member of the editorial board of Neuroimage.

Professor Andrew Lawrence
Behavioural Neuroscience
BSc (Hons) PhD (Loughborough)

Professor Lawrence is a Professorial Research Fellow within the Behavioural Neuroscience division at FNI, and head of the Addiction Neuroscience laboratory. His primary research interest is in the development of robust animal models of drug-seeking, drug-taking and drug-induced neural adaptation. In addition, his group uses these models to define new potential therapeutic targets for drug and alcohol abuse disorders. He has published over 150 original articles and reviews. Andrew Lawrence is currently Senior Editor of The British Journal of Pharmacology and also sits on the editorial boards of Neurochemical Research & Addiction Biology. In 2009, Professor Lawrence was awarded the Australian Neuroscience Society medallion for services to the society. In his spare time, Andrew is a keen cyclist and a surf life guard.
Professor Seong-Seng Tan
Brain Development & Regeneration
BDS (Mal), MDS (Adel), DPhil (Oxon), FRACDS

Professor Tan is NH&MRC Senior Principal Research Fellow, and Adjunct Professor at The University of Melbourne Centre for Neuroscience, and University of Queensland Brain Institute. He is interested in understanding how the brain is assembled during development, and what mechanisms protect brain cells from death following brain injury such as trauma and stroke. Professor Tan has published over 100 papers and was awarded the Amgen Australia Medical Research Award (1997). He is on the Editorial Boards of the Journal of Neuroscience (USA) and Experimental Neurology. Professor Tan is a keen swimmer and a member of the Brighton Iceburgers.

Professor Trevor Kilpatrick
Multiple Sclerosis
MBBS PhD FRACP

Professor Kilpatrick leads the MS Division at FNI and is a neurologist and Head of the MS Unit at the Royal Melbourne Hospital, in addition to being Director of the Centre for Neuroscience at The University of Melbourne. His research interests include the neurobiology of multiple sclerosis, neural precursor cell biology and the study of genetic and environmental factors that contribute to MS as well as the translation of basic research discoveries to the clinic.

Professor Kilpatrick has been the recipient of the Sunderland Award, AMRAD Postdoctoral Award and the inaugural Leonard Cox Award. More recently, Professor Kilpatrick and his Group were awarded the Australian Museum’s Jamie Callachor Eureka Prize for Medical Research (2008) in recognition of their extraordinary contribution to medical research into multiple sclerosis.
Professor Robin McAllen
Systems Neurophysiology
BSc PhD MB ChB

Professor McAllen is a NHMRC Principal Research Fellow. He trained in Physiology in London and Birmingham and in Medicine at Birmingham (UK) before moving to the Florey in 1988. He is a neurophysiologist with an interest in the central nervous regulation of cardiovascular and autonomic functions, and has published extensively of this topic. More recently he has collaborated with FNI colleagues in neuroimaging experiments that aim to translate lessons learned from animal studies to the human brain. He currently serves on the editorial board of the American Journal of Physiology, is a section editor for Clinical and Experimental Pharmacology and Physiology, and is a member of the Faculty of 1000.

Professor Richard Macdonell
Systems Neurophysiology
MD, FRACP, FAFRM (RACP)

Professor Macdonell is Director of Neurology at Austin Health and an Honorary Professorial Fellow at FNI. He trained in Neurology and Clinical Neurophysiology at Austin Health, Massachusetts General and the London Hospitals and has been in charge of the Neurophysiology and Neuroimmunology services at Austin Health since 1991. His research interests include multiple sclerosis, peripheral nerve and muscle disorders and using transcranial magnetic stimulation to study the pathophysiology of epilepsy.
A/Professor Ross Bathgate
Neuropeptides
BSc(Hons) PhD

Associate Professor Bathgate is a NHMRC Senior Research Fellow and an Honorary Principle Research Fellow in the Department of Biochemistry and Molecular Biology at The University of Melbourne. His work focuses on the relaxin family of peptides and their G-protein coupled receptors. He has published over 165 papers including numerous invited reviews on relaxin peptides and their receptors, with a total of over 2500 career citations. His work has attracted substantial funding from the NHMRC and other Australian funding bodies as well as pharmaceutical companies.

A/Professor Helen Dewey
Stroke
MBBS, PhD, FRACP, FAFRM(RACP)

Associate Professor Dewey is Deputy Director of Neurology and Head, Stroke Services, Austin Health; and Associate Professor, Department of Medicine, The University of Melbourne.

Her research interests include the epidemiology, rehabilitation, health economics and service delivery for stroke. Helen is a chief investigator for the ‘North East Melbourne Stroke Incidence Study’ (NEMESIS) and ‘A multi-centre, randomised controlled trial of very early rehabilitation after stroke’ (AVERT). She is a current member of the Editorial Boards for the journals ‘Stroke’ and ‘International Journal of Stroke’ and is a member of the committee for the Stroke Clinical Network in Victoria.
A/Professor David W Howells
Stroke
PhD

Associate Professor Howells began his career investigating the biochemical and genetic basis of dopamine and serotonin deficits in children. He went on to describe a new population of dopaminergic neurons, demonstrated that BDNF depletion can cause parkinsonism and that Parkinson’s disease patients are deficient in BDNF. His other research interest is in stroke: his studies of neuroprotection in stroke have led to improved modelling of stroke in animals, the development of new methods of imaging, and development of systematic review and analysis as tools for rigorously evaluating basic science literature. The latter have led three leading stroke journals to publish guidelines for Good Laboratory Practice.

Dr Amy Brodtman
Behavioural neuroscience
MBBS FRACP PhD

Dr Brodtman is a Senior Postdoctoral Research Fellow, as well as holding joint appointments as a neurologist at Austin Health and Box Hill Hospital.

Her research focuses on novel uses of fMRI in patients with cerebrovascular disease, correlating signal changes with perfusion data and clinical parameters. Other interests are in the neural basis of neglect, and the diagnosis of focal onset dementias.

She is a current recipient of a NHMRC Training Research Fellowship, and was recently appointed as the National Brain School Coordinator, overseeing post-graduate education for neurology trainees.
BEHAVIOURAL NEUROSCIENCE

**ADDICTION**

**Description**
Chronic alcohol and drug use can lead to a cycle of addiction which has serious implications for our society and the families and friends of the drug-affected person. FNI's Addiction Neuroscience Group investigates how alcohol and drugs change the brain's structure, chemistry and function.

**Research Highlights**
The Addiction Group, headed by Prof Andrew Lawrence, examines the neural pathways implicated in drug-seeking behaviour. To achieve this they are using genetic approaches in combination with relevant animal models of drug-seeking and relapse. This latter aspect is of critical importance, as the defining feature of addiction is its chronic and relapsing nature. In this regard, the group has recently demonstrated the enduring vulnerability of relapse in a rodent model which closely resembles the human experience.

Projects currently underway involve the self-administration of alcohol, opiates, cocaine and nicotine in genetically modified animal models. This has led to the identification of a receptor in the brain that is directly involved in the motivational drive to self-administer opiates, and a protein that acts within the cortex to govern the motivational properties of cocaine. The group also has a longstanding interest in defining novel therapeutic targets for drug and alcohol abuse. They have recently demonstrated a powerful interaction between two receptors for brain transmitters that regulates alcohol consumption and relapse to alcohol-seeking.

**SCHIZOPHRENIA, RETT SYNDROME AND WILLIAMS SYNDROME**

**Description**
Many brain disorders, including schizophrenia, mental retardation and autism, involve abnormal development and function of the brain. In a condition like schizophrenia, the experience of loss of contact with reality for sufferers can be intolerable, and also devastating for family and friends.

The Neural Plasticity Group, headed by A/Prof Anthony Hannan, is interested in the mechanisms whereby the genes underlying maturation of the brain are dynamically regulated by interaction with the environment in conditions like schizophrenia, Rett syndrome (an autistic spectrum disorder) and Williams syndrome (another disorder of brain development).

**Research Highlights**
The Group is currently studying the effects of mental and physical activity on these brain disorders, which may provide information that will guide development of future treatments. Using animal models of both schizophrenia and Rett syndrome, it has shown that...
enhanced mental and physical activity can ameliorate behavioural symptoms and exert beneficial effects in specific areas of the brain. Identification of specific molecules that are modulated by environmental stimulation has paved the way for future development of new therapeutic approaches. In collaboration with scientists at the University of New South Wales, the Neural Plasticity Group has also characterised a new model of Williams syndrome, providing new insights into how brain development is disrupted in this disorder.

HUNTINGTON’S DISEASE

Description
Huntington’s disease (HD) is an inherited single-gene abnormality that causes neurons in the brain to become dysfunctional and eventually die. The condition involves cognitive deficits (culminating in dementia), psychiatric symptoms (e.g. depression) and movement disorders (e.g. chorea). HD is one of an increasing number of fatal brain diseases known to be caused by expanding DNA (a ‘genetic stutter’) in the disease genes.

Research Highlights
Previous work done in collaboration with colleagues at Oxford University demonstrated that environmental stimulation delays disease onset and progression in a model of HD. Building on this research, A/Prof Anthony Hannan’s group is currently identifying molecular targets for ‘enviromimetics’: novel drugs which would mimic or enhance the beneficial effects of environmental stimulation.

Furthermore, they have been able to show for the first time that depression in HD can be modelled, and ameliorated by enhanced mental and physical activity. They have also identified key molecules involved in this psychiatric disorder. This will have implications not only for HD, but for depression in the wider community.

Further study of gene-environment interactions and experience-dependent changes in the nervous system may lead to new therapeutic approaches for HD and other brain disorders.

MODELS OF NEURODEGENERATIVE DISEASE

Description
Disorders such as Parkinson’s disease, Huntington’s disease and Alzheimer’s disease are characterized by the progressive death of brain cells. The death of these neurons results in a significant burden of psychological, cognitive and motor disability. The Molecular Neurobiology Diseases group headed by A/Prof John Drago aims to exploit the tools of genetic engineering to understand this spectrum of neurodegenerative diseases.

Research Highlights
The group has generated a number of animal models relevant to neurodegenerative diseases. These animals are important in understanding how the adult brain responds to a focused injury of specific cell populations. The models will also provide information on the precise function of discrete brain cell populations. The surprising findings are that dystonia, a condition characterized by involuntary twisting of the body or limbs, results not from disease of the basal ganglia (a discrete population of cells within the brain) but from damage to solid brain structures. Other aspects of neurodegenerative disease such as disturbances of gait and orofacial function do indeed reside in the basal ganglia; our model of focal death of basal ganglia cells had a classic gait disturbance typically seen in Parkinsonian syndromes. These models are also providing insight into the anatomical seat for anxiety.

COGNITIVE NEUROSCIENCE

Clinical Cognitive Neuroscience
2010 was a year of development for the Neurocognitive Research Group in FNI. We continued to strengthen links between senior researchers and their teams from the School of Behavioural Science (University of Melbourne), the Brain Research Institute, the National Stroke Research Institute, and the Epilepsy Research Centre. We increased links between research projects and the clinical setting, with research at the Box Hill Hospital-based Eastern Cognitive Disorders Centre (ECDC) as well as collaborations with researchers at Austin Health, Royal Melbourne Hospital and the FRONTIER group at the Prince of Wales Medical Research Institute. We continued collaborations with industry, contributing to a COGSTATE initiated project in which a community based examination of cognitive trajectory is studied. The focus of our group remains neuroscientific enquiry at a systems level in both basic and applied (clinical) fields, to facilitate the translation of experimental findings into improved clinical practice using a science-practitioner approach.
**BRAIN DEVELOPMENT AND REGENERATION**

**TRAUMATIC BRAIN INJURY & STROKE**

**Description**
Our work aims to keep brain cells alive after injury, such as that resulting from a stroke or trauma. We also investigate traumatic brain events with the hope of finding new cures for brain injuries.

**Research Highlights**
It has been more than five years since we discovered that the brain has an in-built mechanism for defending itself during injury. We know that after stroke or trauma the brain continues to experience a wave of brain cell death spreading from the site of the injury or blood clot; this is known as the penumbra effect. The deprived neurons “fire” excessively, thus triggering a toxic cascade that causes healthy neurons to die en masse. This continues for several days or even weeks because of the reduced oxygen and glucose supply caused by blood clots and brain swelling.

The reasons for cell death are many, but brain cells are particularly prone to poisoning by metal ions that normally lie outside the cell walls. Neuron firing leads to uncontrolled entry of metal ions, and these cause toxic reactions in the brain cells. We have discovered a protein called Ndfip1 that can stem the inward flow of unwanted metal ions, and therefore reverse the toxic cascade. This means a reduction of the penumbra effect, so that after the danger period has passed, the patient will be left with a greater number of brain cells. This leads to quicker recovery and reduced loss of brain function.

Over the last year, our group has focused on finding ways of increasing the brain cell content of Ndfip1, particularly during crisis situations. This search has resulted in identifying a metal complex compound that “tricks” the cell into activating a crisis response, resulting in increased Ndfip1 levels. Future challenges include conducting toxicity testing for the metal complex, and ascertaining whether or not the level of Ndfip1 is sufficient to improve the overall survival outcome of animals exposed to stroke and injury. The implications of this work are of vital importance: a drug administered soon after a stroke or injury to the brain would prevent the wave of brain cell death, with significant downstream benefits to personal health, social and economic outcomes.

**Brain ischemia**

**BRAIN DEVELOPMENT**

**Description**
Members of our group are interested in studying how brain cells are born and connected in the unborn foetus. In particular, we are interested in how immature cells in the embryonic brain know where to go, what to become, and what other cells they should be connected to.

**Research Highlights**
Reelin is a protein that helps regulate processes of neuronal migration and positioning in the
developing brain. Our current experiments are aimed at understanding how much Reelin is required for ensuring that the cortex is constructed. We are using technology that directly observes live nerve cells as they move about in-vitro, providing us with lessons about how failure of this process can lead to abnormal brain wiring in humans. This work is complemented by our studies on human brain tissue that has been donated for research purposes.

Work on Sez6 and Ndfp1 is also gaining significant momentum. Our laboratory occupies a leadership position in this field of research, and we continue to make inroads on the role of Sez6 in controlling brain cell branching and wiring. Our use of gene knock-out technology has been extremely fruitful for studying how removing the Ndfp1 protein affects brain cells. We have focused our studies on how Ndfp1 controls the production of cell numbers in the foetal brain.
Epilepsy is the most common serious neurological disorder of children and one of the major neurological conditions affecting the general population with up to 10 percent having a seizure at some time in their life.

As one of the world leading centres for epilepsy research, FNI’s epilepsy division specialises in imaging and molecular neurobiology in both humans and animal models. It is integrated with other leading researchers as a core part of the internationally recognised NHMRC Epilepsy Program led by Professor Samuel Berkovic, AM.

The epilepsy division has almost 50 full time staff and more than 20 students and honorary fellows. It has four of nine chief investigators on the recently announced $16.45M epilepsy program grant renewal, a five year grant with funding to commence in 2011. At FNI’s Austin campus researchers have been undertaking high impact research using Magnetic Resonance Imaging (MRI) for over 15 years to understand the structural and functional basis of human epilepsy. At FNI Parkville efforts have revealed many of the fundamental neurobiological mechanisms by which genetic abnormalities give rise to epilepsy. Together with our colleagues from The University of Melbourne and across Australia, we are working towards finding a cure for epilepsy.

Epilepsy imaging

Through the use of advanced MRI methods, major advances continue to be achieved in understanding epilepsy. These advances are rapidly translated to improved patient care through the Victorian Epilepsy Centres comprehensive epilepsy programs, like at the Austin Hospital in Heidelberg where the FNI imaging team is an integral part of the investigation and treatment of epilepsy in patients.

Three of the core scientific aims of our research are:

- To characterise structural and functional effects of genes involved in human epilepsy.
- To develop advanced MRI techniques able to detect subtle structural and functional brain abnormalities not previously possible through human imaging methods.
- To identify abnormal brain networks by defining:
  - Structural network abnormalities
  - Functional networks in the resting state and during EEG defined events.

Much of our research is able to provide immediate benefit for the patient. For example, Periventricular nodular heterotopia (PVNH) is a malformation of brain development associated with epilepsy. Patients with this disorder usually have many abnormal nodules visible on an MRI, and it is often not clear which of these nodules may cause their seizures. In the epilepsy imaging division we have developed technology to perform simultaneous EEG and functional MRI. Using this advanced non-invasive multi-modality neuroimaging method, we investigated a patient who had many nodules and we were able to identify a pair of active...
nODULES. A subsequent operation to remove these nodules succeeded in eliminating the patient’s weekly clusters of epileptic seizures.

**HUMAN BRAIN STRUCTURE AND FUNCTION**

In order to better understand the effect of epilepsy on cognition, we are using advanced neuroimaging techniques to map the functional effect of epilepsy in several cognitive domains. One of the key questions when considering brain surgery to remove an epileptic focus is: will this damage the normal functioning of the patient? To answer this question, one needs a good understanding of how normal brain function is organised, and how this may be perturbed in a person with epilepsy. We have mapped disease-related changes in brain regions responsible for language, memory and musical (singing), and we are also examining changes in these domains post-surgery.

We have discovered that language lateralization (a measure obtained from functional MRI indicating the degree to which a particular side of the brain dominates one’s language function) correlates with verbal memory performance in children with focal epilepsy. Our findings indicate that unusually lateralised language is advantageous for verbal memory performance, presumably as a result of transfer of verbal memory. Our findings also reveal that verbal memory performance provides a better indication of language lateralization than handedness, side of epilepsy or side of lesion.

In a study of children with Rolandic Epilepsy, a condition thought to be benign, we have discovered subtle deficits in particular domains of language function, and have localised these to anterior brain regions.

Little is known about specific brain networks involved in musical ability and how these may be perturbed by epilepsy, but this information is crucial when treating patients who are musicians. In the process of mapping brain areas responsible for singing in healthy individuals, we have discovered that expert singers appear to use less of their language regions when singing than non-expert singers.

Our research includes methodological development in addition to application of advanced neuroimaging methods to map brain changes in epilepsy. We recently developed a new method for detecting atypical lateralisation of language function with fMRI that is more reliable and objective than current techniques.

In our study of Rolandic Epilepsy we explored the nature of the fMRI response to epileptic events and discovered changes in discrete parts of individual nerves that are the probable cause of the increase in brain excitability seen in epilepsy.

For over ten years we have been studying the electrical features that are associated with different types of epilepsy. We have found that symptoms relate to the brain networks activated. This is a major advance in trying to understand the basis of epilepsy and what treatment is appropriate for each form of epilepsy.

The National Institutes of Health-funded project, ‘Long-term outcomes in childhood-onset epilepsy’ is an ongoing prospective cohort of 613 children recruited when first diagnosed with epilepsy. FN1’s role in the project is to apply advanced image analysis techniques to structural MRI scans acquired from a large subset of the original group. These methods provide insight into the links between brain structure and social, educational, and health-related outcomes in patients with childhood-onset epilepsy.

**ION CHANNELS AND DISEASE**

Genetics plays a major role in epilepsy and, in particular, subtle changes in the properties of mutated ion channel proteins have been identified as the cause of many cases of human epilepsy. Through the use of advanced electrophysiological and biophysical tools the Group’s efforts are focused on exposing the fundamental physiological changes that predispose to epilepsy and to reveal novel methods and approaches for diagnosis and therapy.

The Ion Channels and Disease Group, led by Associate Professor Steven Petrou, continued study along two major lines in 2010:

- Using state-of-the-art high throughput, high content analysis methodology, they developed and are perfecting a new approach for revealing small changes in ion channel function in epilepsy patients, and showed for the first time that mutations in a new type of ion channel are the likely cause of fever-related seizures.

- Using computational methods, they continue to provide and analyse evidence that small changes in ion channel function can cause network level changes consistent with the development of epilepsy.

**NEUROBIOLOGY OF EPILEPSY**

The goal of the Neurobiology of Epilepsy Group is to use an integrative, systems level approach to reveal the neural mechanisms that cause epilepsy. Genetic engineering, seizure threshold analysis, EEG analysis, quantitative morphology, physiology and computation are combined by a diverse and multi-disciplinary group to achieve this goal.

The Neurobiology of Epilepsy Group, led by Associate Professor Steven Petrou and Dr Christopher Reid, continued to progress two major areas in 2010:

- Using mouse models harbouring human genetic mutations, they revealed and further researched the fundamental changes in discrete parts of individual nerves that are the probable cause of the increase in brain excitability seen in epilepsy.

- They then went on to develop and enhance a novel mouse model of Dravet Syndrome (a debilitating human infant epilepsy) that reveals fundamental neurophysiological changes responsible for the seizures and movement disorders seen in patients.
**OVERVIEW**

The Genomic Disorders Research Centre (GDRC) was formed to lead the world in research on genetic mutation and its effects on human well-being. It was the first and remains the only centre to focus on gene mutation, its cause, documentation, collection and consequences. The centre coordinates national and international activities such as the Human Variome Project (HVP) along with courses, workshops, and the high profile genetics journal Human Mutation. GDRC also hosts the office of the Human Genome Variation Society.

**PURPOSE**

The HVP, internationally coordinated by the GDRC, is the global community effort to collect, curate and make accessible information on all genetic variations affecting human health. This project has evolved and matured to become a partnership of countries and organisations collaborating in creating the systems necessary to fulfil this task.

The GDRC hosts the International Coordinating Office of the Human Variome Project; this develops global standards systems and collaborations for gene variation data collection, specifically those causing inherited disease. One of its major initiatives is the HVP Neurogenetics Consortium which is collecting genetic data implicated in many neurological disorders.

**ACHIEVEMENTS**

The Human Variome Project
In October, the HVP was incorporated as a Not for Profit Australian company. This is in line with the Project RoadMap ratified at the 3rd HVP international meeting held at the UNESCO headquarters in Paris. A Board of Directors and Scientific Advisory Committee are now in place, and a Country Specific Council and Gene/Disease Council are being established. More information can be found at www.humanvariomeproject.org.

We are pleased to announce that six countries have joined as official HVP nodes: Australia, Belgium, China, Egypt, Kuwait and Malaysia. Furthermore, a Heads of Agreement was signed with the Chinese Government and the Human Variome Project in Washington DC in November 2010. This will bring a major boost to both the Melbourne and global activities, as it represents significant funding. The final document will be signed early in 2011.
During 2010, the GDRC continued work on developing software and systems for the HVP Australian node. This work is funded by a Federal Government National e-Architecture Taskforce Grant scheme. The project will enable gene variation data to be collected from Australian laboratories, allowing enhanced diagnostic abilities for Australian clinicians treating patients with inherited cancers and other debilitating disorders. It is intended to form a model for data collection elsewhere.

2010 Meetings

In 2010, the GDRC held the 3rd Human Variome Project meeting under UNESCO patronage at its headquarters in Paris. Also, the 8th Australasian Mutation Detection meeting was held in Tasmania along with the Molecular Genetics Society of Australia satellite meeting.

HVP Forums were held in Washington on Education and Nomenclature, and two Journal Editors meetings were held along with Human Genome Variation Society meetings in Paris and Washington.

PhD student study

Tim Smith has embarked on a PhD project to examine the role of the database curator in the construction, maintenance and operation of genetic variation databases. These databases provide vital information to clinicians and diagnostic specialists on the frequency, clinical effect and genetic consequences of the numerous variations in our genetic makeup, and are frequently used as clinical tools for the management and treatment of patients. However, despite their importance and frequent use, data management and preservation strategies have never been fully explored in this particular field. This project attempts to define a standard methodology for curating these vital resources.
IMAGING

NEUROIMAGING & MRI DEVELOPMENT

Description
The MRI development group has a longstanding interest in translational research, linking the development of MRI techniques to important clinical and neuroscientific applications. The group, led by Prof Alan Connelly, is internationally recognised as a leader in the development of MRI methods to map blood flow in the brain and to visualise the connections within the brain (using diffusion MRI), as well as in the application of these methods to answer important clinical and neuroscientific questions.

Research Highlights
During 2010, the group continued to develop and implement novel methods for blood flow and diffusion imaging. It has achieved some of the most accurate and robust measures of cerebral haemodynamics, and white matter fibre tracking (i.e. visualising how the brain is inter-connected via a network of white matter fibre tracts).

In particular, the MRI Development group has devised a novel solution to fibre tracking throughout the brain (Constrained Spherical Deconvolution (CSD)), and has developed a software package (MRtrix) to apply this method to neuroscience questions. The technology has been made freely available to the neuroimaging research community, and the software package has been downloaded over 2000 times since its release, indicating the significant international impact of both CSD as a method and the MRtrix software package as an image processing tool. Continued development has resulted in significant improvement in the capability of this approach, in particular to enable the application of diffusion MRI to population studies.

The group is investigating a range of neurological and neuroscientific problems primarily in the areas of epilepsy and stroke. The MRI development and application work forms a core part of a current $12m NHMRC Epilepsy Program Grant, and the application to renew this Program has resulted in the award of a $16.4m Program Grant that received the NHMRC 2010 Achievement Award for the highest ranked Program Grant. Two members of the MR Development team are Chief Investigators on this Program.

Many of the major advances in understanding the basis of the epilepsies have arisen from the ability to image the whole brain and detect underlying pathology, with ever increasing sophistication. The methodology that the group is developing allows the study of families with well-characterised genetic syndromes, thereby enabling the identification and understanding of the effects on the brain of genetic mutations related to epilepsy.

The Group is also part of a $4m CSIRO Flagship Collaboration Fund grant in stroke. This work is aimed at extending the time after symptom onset during which treatment by thrombolysis (to dissolve blood clots) might be used to prevent more extensive brain damage.
NEUROIMAGING & NEUROINFORMATICS

Description
Neuroimaging is an extraordinarily important neuroscience discipline, and is unique in being able to provide direct in vivo measurements of the human brain. This is of crucial importance in research into the causes of brain and mind diseases.

Under the leadership of Prof Gary Egan, the Neuroimaging and Neuroinformatics group utilises MRI in four major neuroscience research areas, including:

1. Assessment of the structural and functional integrity of neural pathways in neurological disorders including Multiple Sclerosis, Huntington's disease and Friedreich's ataxia;

2. Investigation of brain function including the neural base of thirst, pain and cough in normal human subjects;

3. Development of advanced neuroimaging methodologies to enable novel in vivo measurements, such as quantification of iron metabolism in neurodegenerative diseases;

4. Implementation of neuroimaging informatics and data management systems for high throughput analyses and the federation of imaging databases from the National Imaging Facility.

Research Highlights
Novel MRI techniques are being used to quantify axonal and myelin pathology in patients with multiple sclerosis (MS), thereby demonstrating that after unilateral optic neuritis, MRI structural and diffusion measures of the optic nerve can predict the visual dysfunction in MS patients.

Diffusion tensor MR imaging is being used to investigate striatal pathology in Huntington's disease and demonstrated microstructural changes in the caudate and putamen in HD patients that correlated with the patients' cognitive status.

Ultra-high field MRI images are used to measure brain iron uptake for possible use as an imaging biomarker for the investigation of neurodegenerative diseases such as Huntington's and Parkinson's disease.

The division also collaborates in ultra-high field MRI research at the Neuroscience Research Institute, Korea. This project is being funded by an ARC Linkage International project entitled, “e-Research in the Neurosciences: building collaborations in Asia”.

Finally, the Neuroimaging group led submissions to the Federal and Victorian State Governments from a consortium of universities and institutes to fund the establishment of an ultra-high field MR and advanced PET imaging facility in Melbourne. A $5.75 million grant was received by the University of Melbourne, in collaboration with the Florey and the Mental Health Research Institute, from the Federal government for the establishment of a 7 Tesla MRI scanner. A $2.4 million grant was received by the Florey and Monash University, in collaboration with Melbourne and Swinburne universities, from the Victorian State Government to establish the Victorian Biomedical Imaging Capability.
MULTIPLE SCLEROSIS

Description
Multiple Sclerosis (MS) is a disease of the central nervous system (CNS) that causes demyelination (cellular layer stripping) of the nerve sheath. The disease strikes young adults in their prime of life, and in its most severe form results in multiple neurological symptoms including weakness, visual loss and cognitive decline. The MS division, led by Professor Trevor Kilpatrick, aims to make fundamental discoveries that will improve our capacity to treat and ultimately prevent MS.

Research Highlights
Exploring the cause of MS
The group’s genetics work has recently received wide scientific and media attention. As principal members of the ANZgene consortium, we published data in the highly regarded journal, Nature Genetics. We reported on two novel genetic associations, one that encompasses a number of genes (including one that converts inactive Vitamin D to its active form) and the other a gene (CD40) that modifies immune cell activation.

Further to this end, Dr. Judith Field and her collaborators established that the mutation we identified in the CD40 gene alters the expression of the CD40 protein in subsets of immune cells. We are examining the relevance of CD40 to initiate MS.

During 2010, we have extended this work and have identified another gene, named Mertk, which also presents as a susceptibility gene for MS. Importantly, Mertk is one of three receptors that we have shown to minimise the severity of demyelinating disease. Discovering how these receptors exert this beneficial effect and designing drugs that stimulate activation of these receptors will form an important part of our future research strategy.

A New Animal Model of MS
Dr. Toby Merson and PhD students Laura Oluich and Jo Stratton have generated and analysed a new model of MS. Their work concentrates on oligodendrocytes, the cells responsible for producing myelin, a fatty protein which insulates axons (the long extension of nerve cells) as they transmit nerve signals.

The oligodendrocytes are selectively induced to die, enabling a detailed study of downstream responses, including axonal degeneration, immune activation and oligodendroglial regeneration. The animal models develop disease in a common way and this precedes the development of demyelination, indicating that subtle changes in oligodendroglial-axon interactions can cause disease well before demyelination occurs. These mice will be important in assisting our understanding of how a complex disease such as MS is initiated and in testing the efficacy of therapeutic agents.
Novel therapies

Dr Holly Cate and her PhD student, Jennifer Sabo, have established that a family of molecules known as BMPs is critical in regulating how the nervous system regenerates in response to demyelination. They have found that BMP signalling increases the number of cells in the brain with demyelinating disease, but inhibiting this signalling enables these cells to mature into oligodendrocytes, which are responsible for inducing repair and remyelination. This work provides important perspectives on how regeneration can be enhanced in MS. It is now proceeding in collaboration with Professor Patrizia Casaccia at Mount Sinai in New York.

Dr Simon Murray and co-scientists continue to study the important signalling molecules known as BDNF that influence myelination. The BDNF molecules signal via two receptors, one of which is important in promoting the capacity of oligodendrocytes to myelinate within the CNS. Dr Murray and his collaborators are now exploring ways in which BDNF signalling might be promoted for therapeutic benefit, utilising synthetic peptides. The peptide research is being undertaken in collaboration with Dr Tony Hughes of the Department of Pharmacology, The University of Melbourne.

Resident immune cells within the brain known as microglia have an important role to play in MS. Working with A/Professor Helmut Butzkueven and Professor Trevor Kilpatrick, Vilija Jokubaitis has discovered that the protein Disabled-2 (Dab2) is expressed by microglia during demyelinating disease, and that depletion of Dab2 in mice diminishes disease severity. In ongoing research, we are now assessing the mechanism by which Dab2 increases microglial-mediated tissue damage. This research aims to identify potential ways of modulating microglia in order to reduce brain damage (in particular axonal injury) in MS.

Novel measures of disease activity

Most MS disability is thought to be caused by nerve cell and in particular axonal process injury that occurs during demyelination. We are attempting to identify a suite of markers that can be used to test the efficacy of novel neuroprotective agents that we and others believe could be useful treatments for MS. At present there is no way to accurately quantify the degree of nervous system damage in clinical studies. To address this need, we are undertaking two ongoing and complementary approaches, the first involving neuroimaging and the second developing a blood-based biomarker.

Dr Anneke van der Walt and Dr Scott Kolbe have undertaken a detailed study of patients with acute optic neuritis, a common problem in MS. Unlike other regions of the central nervous system, the optic nerve is a relatively simple structure that is amenable to detailed study, using MRI measures of retinal nerve thickness and measuring the efficiency of electrical conduction from the eye to the visual cortex. We have used a new MRI technique that measures the efficiency of water diffusion along nerves – this is compromised when they become damaged. Our preliminary results indicate that early abnormality in this measure is useful in predicting subsequent damage. This could have a role both in selecting appropriate patients for clinical studies and in efficient monitoring of the response to novel therapies.

Associate Professor Helmut Butzkueven and Dr Melissa Gresle continue to assess the utility of recently described blood-based markers of axonal injury in MS. In particular, they have found that phosphorylated Neurofilament-Heavy Chain (pNF-H), a protein produced by neurons, leaks into the blood after nerve damage. Emerging data indicates that pNF-H is expressed in a subset of patients with MS and that these patients, on average, experience more severe forms of the disease.
PARKINSON’S DISEASE

Description
Parkinson’s Disease (PD) is the second most common neurological condition in Australia affecting 80,000 people at any time. On average, 25 Australians are diagnosed every day, and one in seven will be under 50 years of age. Patients in the advanced stages depend on 24-hour care from loved ones or professionals. PD is a progressive and degenerative condition that impairs the control of movement. Symptoms result from the progressive degeneration of nerve cells, including those that make dopamine, a chemical messenger necessary for smooth, controlled movements.

Research Highlights
The PD research group, led by Prof Malcolm Horne, has found that a key protein accumulating in brain cells of people with PD is also at a high level in the blood of people with PD. The protein (called α-synuclein) is made by blood cells, and so the team is investigating whether blood cells can be used as a demonstrative model of how α-synuclein damages and destroys brain cells.

As the levels of α-synuclein can measure the risk of PD, the team is also studying how genetic variations in PD subjects may influence α-synuclein levels. The PD research group has engineered an animal model that accumulates α-synuclein in the brain, thereby enabling them to use cell cultures to gain a better understanding of how α-synuclein damages cells and why its secretion is associated with increased cell death.

Dr Tim Aumann, a member of this team, has found that new dopamine neurones can be made in the adult brain. His interest now is to understand how this is controlled, and how the process might be exploited as a new therapy for PD.

MOTOR NEURON DISEASE

Description
Motor Neuron Disease (MND) is a debilitating disease striking 1,400 Australians each year. MND often begins with weakness of the muscles in the hands or feet and eventually leads to generalised paralysis, including an inability to speak, swallow and breathe. The MND research group led by Dr Brad Turner, Prof Malcolm Horne and Prof Philip Beart is investigating the cellular and molecular events that lead to MND with a view to creating ways to block the disease’s progression.

Research Highlights
The group has identified the sequence of key events leading to the death of the affected cells. They have found that stressing the compartment making proteins (Endoplasmic Reticulum or ER) is a key step. One molecule in particular seems very important; known as Protein Disulphide Isomerase (PDI), it is elevated in all forms of the disease. Augmenting this molecule in models of the disease affords considerable protection, and...
the team is now examining the possibility that small molecules mimicking PDI could be used as a therapy. High levels of PDI have also been found in the brain-spinal fluid of people with MND, suggesting that it could be used to monitor the effect of therapies. As well, they have found that processes which remove PDI and other key molecules associated with Motor Neurone Disease are disrupted in this disease, providing clues to causes and therapy for this condition.

**NEUROPHARMACOLOGY**

**Description**

Astrocytes are the most abundant non-neuronal cells in the brain, and they possess remarkable capacities to modulate neuron-to-neuron signalling, to nourish and to protect neurons, and to contribute to their death in neurodegenerative conditions.

**Research Highlights**

The neuropharmacology group, led by Prof Philip Beart, has found that under conditions which mirror perinatal and stroke injury, a number of events are triggered within astrocytes that act to preserve neuronal function when there is a lack of oxygen to the brain. One component of this defence mechanism is a transporter that controls the levels of the brain’s positive chemical response. The group identified a remarkable capacity of astrocytes to maintain the activity of this transporter when under severe stress, but discovered that continued stress forces astrocytes to actually contribute to the toxic environment.

These events comprise part of the brain’s inflammatory response, and recent insights into the genes involved offer possibilities to minimize neuronal injury and promote regeneration.

**STEREOID NEUROBIOLOGY**

**Description**

Every day experience tells us that sex hormones influence behaviour, but how well do we understand the mechanism? To demonstrate the effects of sex hormones on brain functions and behaviour, we are studying an animal model which is completely estrogen-deficient.

**Research Highlights**

The steroid neurobiology group, led by Dr Wah Chin Boon, has demonstrated that in the complete absence of estrogens, the pyramidal neurons in the frontal cortex die, even without any form of external damage. By one year of age, female knockout mice have 33 percent fewer cortical neurons than mice making estrogen normally (the wild-type mouse). This demonstrates that estrogens protect nerve cells from normal physiological stress. Curiously, male animals do not suffer the same fate. We are currently investigating the mechanisms underpinning the vulnerability of female neurons in the absence of estrogen.

**CELL THERAPIES & NEURAL DEVELOPMENT**

**Description**

Replacing damaged or injured neurons by transplanting stem cells is an exciting prospect for a future therapy. Stem cells can divide, and are thus a potentially limitless source of new cells. They can also be instructed to become a particular cell type, such as a dopamine neuron (the degenerating cells in PD). The cell therapies team aims to use these two capabilities to produce cells that can partially restore function after disease or trauma.

Repair of the injured brain will also depend on identifying the optimal cell for transplantation and understanding the appropriate signals to promote the integration of these cells into the host circuitry. It is thus important to understand the events involved in the development of select neuronal subpopulations (such as dopamine neurons) and the regulators of axonal growth and guidance.

**Research Highlights**

The Stem Cell Research team, led by Dr Clare Parish and Dr Lachlan Thompson, is developing new strategies to improve cell transplantation in neurodegenerative disease models, including Parkinson’s disease, Motor Neuron Disease and Huntington’s Disease. In this context, they are examining both rodent and human neural stem cells and embryonic stem cells.

They are also working to understand the events that result in maturation of selected neurons during development. Replicating these events will be critical in ensuring that appropriate neurons and neural connections are made upon transplantation into the diseased brain.
**Description**

The Neuropeptides division conducts broad-ranging studies on the relaxin family of peptides/hormones and their receptors. The division focuses on determining the role of these peptides in a wide range of disease states. The aim of this research is to develop therapeutics based on these peptides to treat vascular, fibrotic, metabolic and psychiatric diseases.

**Research Highlights**

The group’s long-standing research focus on relaxins and their receptors continued in 2010, with more exciting advances in understanding receptor signalling and function. The team delved deeper into understanding the structure of relaxin peptides, the design and synthesis of the components determining their biological activity and how they are metabolized. New viral-based methods for peptide delivery and peptide depletion in the brain were also pioneered by the division during 2010.

Studies of relaxin-3, both pharmacological and in an animal model where the peptide has been “knocked-out”, have uncovered important roles for this neuropeptide in the regulation of circadian activity, spatial navigation, fear memory and motivated behaviour. The work is being conducted in an exciting collaboration with the Behavioural Neuroscience Division at FNI and scientists at the Weizmann Institute, Israel. Collectively, we are studying the role of neuropeptides, including relaxin-3, in stress and mental illness, and the group has developed new, smaller, receptor-specific analogs of relaxin-3 which will greatly assist in further research. This program has been funded by grants from the NHMRC, The Besen Family Foundation and The Pratt Foundation.

Following the acquisition by Novartis (Basel, Switzerland) of our commercial partner, Corthera Inc. (San Mateo, USA) in 2009, the Phase III clinical trial for relaxin in heart failure continued during 2010; results should be known soon. A successful outcome could lead to royalty-based research funding for the Florey and the Neuropeptides Division. If a drug goes into production it will have a significant impact on the treatment of acute heart failure, and could open the way for testing the efficacy of relaxin in other fibrosis-related diseases.
BASIC SCIENCES

Description
Basic Sciences focuses on improving therapy for stroke through evaluating the data for candidate drugs. We screen these drugs for efficacy in stem cell derived human neurons and glia, and subsequently test them in rodent models of stroke incorporating common human comorbidities which increase stroke risk or make stroke worse for patients. This also allows us to develop an understanding of the long term consequences of stroke in these animals. This work has contributed to the development of international guidelines for the conduct of animal experiments to increase the chances of finding drugs that will be successful in clinical use.

Research Highlights
Led by Associate Professor David Howells, the Basic Sciences group has continued its leadership role within the CAMARADES collaboration, an international group which continues to drive worldwide improvements in the standards of stroke research. This work has increased understanding of how hypertension and diabetes influence the benefits provided by candidate drugs. Experimental work has confirmed that hypothermia offers one route to protecting the brain and spinal cord from ischaemic injury. The recruitment of the Schmidt group from Monash has added regulation of oxidative stress to our repertoire of candidate stroke therapies. A major new collaboration with CSIRO has led to the discovery of blood biomarkers which we hope will expand the range of patients who qualify for the use of clot-busting drugs.

IMAGING AND ULTRASOUND

Description
Research led by Professor Geoffrey Donnan and Associate Professor Brian Chambers is directed at developing methods to obtain a view into the brain and blood vessels before and after stroke. This involves state-of-the-art technology such as positron emission tomography (PET), magnetic resonance imaging (MRI) and ultrasound.

Research Highlights
The ischaemic penumbra (an area adjoining the stroke site where metabolism is still active but blood flow is diminished) continues to be an important focus of our research. In collaboration with colleagues at the Royal Melbourne and Austin Hospitals, our research group showed that MR imaging could identify patients with potentially viable brain tissue after stroke onset. In particular, a Phase II study led by Professors Stephen Davis and Geoffrey Donnan, showed that a selection of patients using this approach for therapy with the clot dissolving agent tPA could be safely extended out to six hours after stroke onset. They are now leading a Phase III trial to apply this same principle up to nine hours post-stroke, thus potentially increasing the number of patients eligible to receive the therapy.
Another significant initiative is the use of Positron Emission Tomography (PET) which provides an image of chemical changes associated with vascular dementia, stroke and Alzheimer’s disease which may be in part unravelled by this technique.

The clinical significance of a new ultrasound sign referred to as ‘small vessel knock’ is currently being investigated. FNI is collaborating with Compumedics DWL and Dr Paul Syme in Edinburgh to determine whether ‘knock’ is useful in the diagnosis of stroke.

A/Prof Brian Chambers, with funding from MS Research Australia, is investigating a possible relationship between multiple sclerosis and obstruction of vein drainage in the brain and spinal cord. The study involves an ultrasound examination of 100 MS patients and matched healthy controls.

Finally, as part of his PhD work, Dr Udommongkol, in collaboration with CSIRO and a group in Leicester UK, has created a bench-top scaled-up model of a vessel branch which allows modelling of blood flow. This will enable the study of ultrasound signals under different conditions such as those occuring in the brain during a stroke.

PUBLIC HEALTH AND EPIDEMIOLOGY

Description
Research led by Dr Dominique Cadilhac in Public Health and Associate Professor Helen Dewey in Epidemiology is focused on understanding how to achieve better outcomes and efficiencies in the clinical management of stroke and disease prevention.

Research Highlights
In 2010, several major projects focused on the assessment of the quality of care for patients with stroke and/or transient ischaemic attack (TIA) admitted to Australian hospitals. This included expanding the Australian Stroke Clinical Registry (www.auscr.com.au) to a dozen sites, conducting interviews with clinicians about the Victorian Stroke Clinical Network initiatives, undertaking pre/post assessments of the NSW Rural Stroke Project and providing academic input to the National Audit Program of the National Stroke Foundation (NSF). Partners included The George Institute for Global Health, the National Stroke Foundation, State Government of Victoria, New South Wales Health and La Trobe University.

In the area of acute clinical management, treatment within the first four hours of stroke is most critical. The Victorian Stroke Telemedicine project is designed to test the feasibility of enhancing the diagnosis and treatment of stroke using telemedicine equipment to link Bendigo Health and Melbourne-based neurologists. The aim of the project is to develop an acute stroke telemedicine model that could be applied in other regional and rural communities. The project is led by Florey Neuroscience Institutes, on behalf of the Department of Health (Victorian Stroke Clinical Network), Bendigo Health, Loddon Mallee Rural Health Alliance, National Stroke Foundation and Ambulance Victoria. The VST project also acknowledges the support of Polycom Inc, Telstra and the Stroke Association of Victoria Inc. The $2.13 million project received co-funding from Department of Innovation, Industry and Regional Development (Victorian Government).

In the field of Epidemiology, Dr Wenwen Zhang is completing her PhD investigating the diurnal blood pressure patterns of patients with TIA compared to control subjects. This project is supervised by Helen Dewey, Dominique Cadilhac and Geoffrey Donnan.

NEUROREHABILITATION AND RECOVERY

Description
Neurorehabilitation and Recovery research, led by Professor Leeanne Carey, focuses on the scientific foundations of stroke recovery and rehabilitation in order to optimise outcomes for stroke survivors. This is achieved through four complementary streams of research:

Research Highlights
Mechanisms of Recovery using Brain Imaging
Investigations into the mechanisms underlying stroke recovery continue to broaden our knowledge to support the development of novel rehabilitation interventions and to build a model of recovery of sensory functions after stroke. Our findings from the IN_Touch (Imaging Neuroplasticity of Touch) study have provided new insights into brain regions associated with better recovery, and how these regions may change over time. In our new study, CoNNECT (Connecting New Networks for Everyday Contact through Touch), the focus is on brain networks and the functional and anatomical connections between brain regions. Commencing in 2010 this project aims to better understand the
residual brain networks and capacities of the individual stroke survivor and how these might be optimised in rehabilitation. Preliminary findings suggest changes in connectivity across hemispheres and involvement of remote networks beyond the lesion site.

Predictors of post-stroke depression and recovery

In 2010 we commenced the START: STroke imAging, pRevention and Treatment study in collaboration with CSIRO. This is a large, multi-centre clinical trial that comprises the EXTEND study (EXTending the time for Thrombolysis in Emergency Neurological Deficits) and PrePARE substudy (Prediction and Prevention to Achieve Optimal Recovery Endpoints after stroke). Our focus is on indentifying predictors of depression and functional outcome based on putative biochemical, genetic and imaging biomarkers in the START cohort. In the PrePARE subgroup we investigate the relationship between novel imaging markers, depression and functional outcome as well as the association between post-stroke depression, cognition, and participation in daily activities.

Restorative approaches to rehabilitation

We developed and recently tested a new approach to retraining the brain to feel lost sensations after stroke. Known as SENSe (Study of the Effectiveness of Neurorehabilitation on Sensation), this approach builds on the ability of the brain to adapt and learn new skills. We train the brain to make sense of the altered sensations and help the person use these in the context of everyday tasks. We found that stroke survivors improved their ability to feel touch and limb position sensations better than through the current approach of by exposure alone. They also improved their ability to use the arm in everyday activities. This active approach to training the brain is a major shift in current rehabilitation approaches that typically focus on compensation. We are now developing DVD and online materials to teach therapists to use this approach in the clinical setting.

Nature of Sensorimotor Impairment and its Impact on Function

During 2010 we focused on translating our recent developments in quantitative measures of sensation for use in the clinical setting. This has involved evaluating brief versions of our new measures for use in a sensory screening tool with rehabilitation patients post-stroke, which will be tested in 2011.

AVERT – EARLY INTERVENTION

Description

Research led by Associate Professor Julie Bernhardt focuses on the development, testing and implementation of pragmatic early physical activity and exercise-based interventions for people with stroke, and on understanding how they affect muscle, bone, mood and cognitive ability. The key objective of the program is to find new ways to reduce the burden of disease due to stroke.

Research Highlights

A Very Early Rehabilitation Trial (AVERT) is now the largest clinical trial of stroke rehabilitation in the world. AVERT is an international, multi-centre study testing whether commencing frequent out of bed activity within 24 hours of stroke reduces death and disability compared with current stroke care. A cost-effectiveness study also sits beside the trial, and involves approximately 550 physiotherapy and nursing clinical leaders and other acute stroke clinicians from a broad range of backgrounds from six countries. Recent funding from the Stroke Association (UK) has supported the employment of a dedicated trial manager in the UK, and we anticipate expanding to a further 15 hospitals throughout the UK in 2011. The study will recruit over 2000 patients who are followed for 12 months and we expect to complete recruitment in 2012.

The longitudinal study of how stroke influences bone and muscle loss and glucose sensitivity began in 2010. Led by Karen Borschmann, this study follows stroke patients for six months. This project brings together researchers from many disciplines including physiotherapy, neurology, endocrinology, exercise physiology and nutrition and imaging. The gold standard pQCT bone CT scanner, the only one of its kind in Australia, allows us to study bone changes in detail. Phase one will determine both the rate of loss of bone and muscle, and how this influences glucose sensitivity and recovery. This information will be used to develop intervention strategies to help delay or prevent the often disabling effects of musculoskeletal changes after stroke.

Visiting fellow Dr Torunn Askim from Trondheim, Norway, spent six months of 2010 with us, during which we completed a number of collaborative projects and developed new ones. The focus of this collaboration is on the study of rehabilitation interventions, and their short and long term impact on health related outcomes and quality of life.
SYSTEMS NEUROPHYSIOLOGY

Description

Professor Richard Macdonell and Associate Professor Ragy Division at FNI. A/Prof McAllen’s group researches brain function in health and disease, with a particular focus on how the brain controls basic bodily functions such as blood pressure, temperature, body fluids and breathing. Prof Richard Macdonell heads the clinical arm at the Austin Hospital which researches the physiological changes underlying epilepsy.

Research Highlights

Brain regulation of body temperature

Humans and most other mammals maintain core body temperature at or close to 37°C. This remarkably constant temperature is probably the most obvious manifestation of homeostasis, the ability to keep the body's internal environment as unchanged as possible in the face of a hostile environment. This is one of the main reasons that we have been able to populate and survive in many regions of the planet. Temperature homeostasis in mammals is achieved by a number of compensatory physiological and behavioural mechanisms that have evolved to respond to changes of environmental and body core temperature.

The main control of body temperature occurs in the brain, specifically in the neighbouring preoptic and hypothalamic regions. Within the preoptic region, nerve signals from temperature sensors in the skin are integrated with information from sensors of core body temperature, and this information is used to initiate thermoregulatory responses that will correct any deviations from normal body temperature. Compensatory responses to cold include constriction of skin blood vessels, shivering and generation of heat from brown fat tissue, whilst sweating, increased heart rate and skin vasodilatation are responses to overheating. During a fever, the balance of these thermoregulatory mechanisms is reset, while during heat stroke the regulatory mechanisms are overwhelmed. The consequences of failure in these mechanisms can be life-threatening: elderly people with impaired temperature regulation frequently die of heat stroke during heat waves.

Until recently, the way in which incoming neural signals from skin were integrated with signals from core temperature sensors within the preoptic region of the brain was largely unknown. We have now identified the neural pathways that serve that function, and this may revolutionise our knowledge of how the brain regulates body temperature. Incoming neural signals from the skin have been shown to be relayed to the preoptic region of the brain. We have identified two distinct sub-regions within the preoptic region that control skin blood flow to regulate heat conservation or heat dissipation.
Treatment of heart attack and heart failure

Following a heart attack, blood flow supplying oxygen and nutrients to the downstream tissue stops and the tissue dies. In tissue around the affected area there is a reduction in blood flow and oxygen delivery, which leads to further cell death and expansion of the damage. The primary intervention in the emergency department is to remove the blockage and stimulate blood flow to the affected tissue. Unfortunately, opening blood flow to damaged tissue increases oxidative stress and causes calcium to move into cells (causing cell death), but there is currently no treatment to prevent this injury.

Over the last 10 years we have been developing a drug to tackle this problem. As this drug could not be given intravenously, we have developed a related prodrug (NP202) that we have shown to be as effective as its related parent compound. We have shown that NP202 reduces damage to the heart after a heart attack in animals by up to 30%.

In recent studies we have been examining the cellular mechanisms by which NP202 reduces cell death during blood flow reintroduction. It is known that there are a number of biochemical pathways within the cells of the heart muscle that can be stimulated to reduce blood flow-induced cell death. By individually blocking these biochemical pathways, we have shown that NP202 acts selectively on a specific biochemical reaction pathway to reduce damage. Further studies are now investigating exactly where in the pathways NP202 acts.

Physiological Changes in Epilepsy

Over the past year we have continued our physiological exploration of epilepsy. We are researching the concept that the hyperexcitability of neurons in the cerebral cortex of the brain is a prime cause of epilepsy. Using a technique known as Transcranial Magnetic Stimulation (TMS), we have been able to confirm the findings from animal models that hyperexcitability of cortical neurons in humans does indeed underlie epilepsy. We use TMS to stimulate the area of the brain that controls hand movement to study the size of involuntary movements. These are increased if the brain is hyperexcitable.

TMS limits us to studying hyperexcitability in the motor cortex, but we are currently extending this work to study other areas of the brain using fMRI. This aims to discover whether the distribution of hyperexcitability in the brain constitutes a network of interconnected neurons which form an abnormal electrical circuit.

There has been interest lately in implanting electrodes in the brain of patients with intractable seizures in the hope that brain stimulation may reduce seizure frequency, possibly by breaking this abnormal circuit. We are currently investigating whether trains of high frequency TMS pulses provided over the scalp can also reduce brain excitability and how long this lasts. If we find this to be the case it would provide further evidence to support the use of stimulation devices and a greater understanding of the physiological mechanisms which might bring this about.
RESEARCH PLATFORMS
RESEARCH PLATFORMS

CLINICAL TRIALS

Description
The Clinical Trials division, led by Prof Geoffrey Donnan, oversees about 20 trials being conducted at any one time. These include investigator initiated studies as well as those initiated by commercial partners. Expertise has been provided in overall clinical trial management including statistics and informatics, and regulatory affairs.

Research Highlights
Acute stroke therapy is still a major focus of our research. EPITHET, a Phase II trial using brain imaging, was completed and published in the prestigious journal, Lancet Neurology. We showed that extending the therapeutic time window for using clot dissolving drugs from 3 to 6 hours is safe, feasible and biologically plausible. We are in the process of commencing a new trial (EXTEND) to further test the hypothesis that the time window may be increased to 9 hours. This study is being carried out in collaboration with CSIRO as part of their flagship program as well as the NHMRC through our stroke program grant.

A Very Early Rehabilitation Trial (AVERT) led by A/Prof Julie Bernhardt is in Phase III. In this innovative study, the idea that earlier and more intensive out of bed activity of stroke patients will improve outcomes and be cost effective, is being tested on 2,104 subjects. Recruitment now sits at more than 700 patients from over 30 hospitals in Australia, New Zealand, Scotland, Northern Ireland, Wales, Singapore, Malaysia and Canada.

STATISTICS & INFORMATICS

Description
The Statistics and Informatics research platform provides research and teaching expertise in the study design, protocol development, data collection and statistical analysis aspects of research projects. An important source of that expertise is our methodological research that promotes the use of high-standard, rigorous quantitative methods to facilitate effective evidence generation, accumulation, and reuse in basic and clinical neurosciences.
Research Highlights

- During 2010, Statistics and Informatics provided statistical and data management support to a number of large international clinical trials including AVERT and EXTEND. We also provided statistical support for SCIPA, a unique, multi-disciplinary, multi-centre research program which aims to promote neurological recovery, maintain health and wellness, and optimise independence following spinal cord injury.

- In the area of Medical Informatics, we were one out of three finalists for the Decision Analysis Society 2010 Practice Award by the Institute for Operations Research and Management Sciences. This recognized our work in successfully applied multiple-criteria decision analysis to choose the most appropriate computer software for imaging the ischaemic penumbra in acute stroke patients.

- In 2010, we contributed considerably to research training activities within FNI and Melbourne Brain Centre by developing and running a one week long “Good Experimental Study Design and Analysis” module as part of the Melbourne Neuroscience Research Training Program.

In our on-going collaboration with Swinburne University of Technology we continue our research to create a simulation model for a complete Stroke Chain of Survival and Recovery. This will model various complex scenarios resulting from the interactions between pre-hospital, acute, and rehabilitation stroke care processes, and will provide insights into better delivery of stroke care. A pre-hospital acute stroke services simulation model has generated great interest from both National Stroke Foundation and Department of Human Services, Victoria as an analytical evidence-based tool to improve pre-hospital acute stroke services care processes.

NEURO RESEARCH SERVICES

Description

Neuro Research Services (NRS) provides three core technology platforms to FNI and the wider research community. They encompass rodent neurohistology, advanced microscopy, and behavioural phenotyping. Each facility is maintained to the highest standard, and dedicated personnel provide equitable access, training and technical guidance for users. NRS also provides access to researchers from other institutes and universities throughout Australia and overseas, and offers contract research services to the commercial biotechnology sector.

The NRS multi-user microscope suite encompasses two confocal imaging systems, TIRF (Total Internal Reflection Fluorescence) microscope and several fluorescence, brightfield stereology microscopes, as well as post image analysis workstations for qualitative and quantitative assessment of brain and other tissues. The neurohistology team has extensive knowledge of rodent brain morphology, and provide support to Florey researchers undertaking tissue preparation, staining, imaging and analysis.

NRS has continued to provide Florey researchers with access to the most comprehensive range of rodent behavioural testing facilities in Australia. As construction of the Melbourne Brain Centre, is well underway, Dr Travis Featherby has reviewed the latest technology in rodent behaviour and work undertaken by other prominent neurobehaviouralists to ensure that we continue to provide and maintain a state-of-the-art platform for researchers moving into 2011.
Description
The Florey continues to create exciting commercial opportunities linked to our research projects.

The organisation has had a remarkable year with successful applications to both rounds of the Victorian Government’s Victorian Science Agenda funding schemes as well as investment by Commercialisation Australia in our learning and memory technologies.

FNI’s portfolio of research spanning basic, clinical and translational research continues to grow, with prudent identification and protection of commercially relevant programs. This has culminated in four new provisional applications being filed and two patents granted in international jurisdictions in 2010.

The purchase of FNI’s relaxin program by Novartis in early 2010 has accelerated the clinical trial program, now in phase III. The molecule was first discovered by Florey researchers some 20 years ago.

The next period will see a review of existing intellectual assets and the development of new strategies to capture value from our internationally recognised efforts in neuroscience.

The Florey is indebted to the generosity of the members of it’s commercialisation committee, Chaired by Mr Robert Trenberth.

The period ahead will allow us to expand new linkages and synergies emerging from the clustering of our neuroscientists at the Parkville and Austin campuses.
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Mr Graeme Bowker
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Year Ending December 2010

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Mr Robert Trenberth

Project Committee (FNI representatives)
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Prof Geoffrey Donnan
Mr Gary Gray
Prof Graeme Jackson
Mr Mark Jones
Prof Richard Larkins

Pictured with Professor Fred Mendelsohn AO, former Institute Director, (centre) at a FNI Annual General Meeting are Board members - Chairman, Mr Charles Allen AO, current Institute Director, Professor Geoff Donnan, Deputy Director, Professor Graeme Jackson, and Mr Mark Jones.
FNI Foundation Council

Mr Stephen Spargo (Chairman)
Mr Charles Allen AO (Ex officio)
Mr Andrew Darbyshire
Prof Geoffrey Donnan
Ms Michelle Jablko
Mr Simon Peck
Mr Nick Terry

Key Positions

Board of Management
Mr Charles Allen (Chairman)
Mr Craig Drummond (Honorary Treasurer)
Prof Geoffrey Donnan (Scientific Director)

Directors
Mr Andrew Abercrombie
Prof Andrea Hull
Prof Graeme Jackson
Mr Mark Jones
Prof Anne Kelso
Prof Richard Larkins
Dr Brendan Murphy
Prof Peter Rathjen
Dr Thomas Schneider
Mr Stephen Spargo
Mr Robert Trenberth

Alternate Director
Mr Mark Jones (for Dr Thomas Schneider)

FNI Deputy Directors
Dr Henry De Aizpurua
Prof Graeme Jackson
Prof Malcolm Horne

FNI Associate Directors
Prof Alan Connelly
Prof Gary Egan
A/Prof David Howells
Prof Andrew Lawrence
A/Prof Steve Petrou

Chief Operating Officer
Mr Gary Gray

Board Resignations
Mr Allan Myers (09/02/10)
Mr Harrison Young (20/05/10)
Sir Winston Churchill once said:

We make a living by what we get,
we make a life by what we give.

We sincerely thank all our supporters, including those who wish to remain anonymous. Your generous contributions will help to ensure that we can continue to create a healthier future for all Australians.
Liam Dixon
Jacqueline Digby
Todd Dickson
Marion Dickinson
Roy Dickens
Tom Dewhurst
George Deans
Ann De Paul
Carol De Cotta
Constance Day
Paula Davis
Angela David
Geoffrey Davey
Andrew & Cathryn Darbyshire
Archibald Dalley
Judit Dalley
J ohn Dalton
Lois Dailb
Domenic & Lydia Danastasio
My Dung Dang
J une Danks
Carole Darby
Claire Darby
Philip Darby
Andrew & Cathryn Darbyshire
James Darcy
L Gordon Darling AO CMG
Arthur Davy
Geoffrey Davy
Angela David
Andrew Davies
Christine Davis
Paula Davis
Robert Davis
Constance Day
Carol De Cotta
Ann De Paul
George Deans
Verna Dempster
Katherine Derham-Moore
J acob Desserou
Tom Dewhurst
Roy Dickens
Marion Dickinson
Todd Dickson
J acqueline Digby
Saul Dishon
Liam Dixon
J ohn Donaldson
Sarah Donnan
Patricia Donovan
Nancy Dooley
J an Dorssempt
J ill Douglas
Marjorie Douglas
Philip Douglas
Carl & Wendy Dowd
Michael Dowling
Suzanne Downes
Audrey Doyle
J ohn Doyle
Mary Doyle
Alison Driver
Felicity Druce
Craig Drummond
Ian Drummond
George Dryden
Warwick Du Ve
Larissa Dubecki
Margaret Duff
Duffy & Simon Lawyers
J an Dunbar
Kimiko Duncan
R M Duncan
J ason Du-Vuung
J enny Dwyer
Sarah Dyer
Eddy Edelman
Betty Edington
Barbara Edwards
Gary Edwards
Alexandra Ehert
Marie Einoder
E M Financial Services Pty Ltd
Lilian Ekselman
Fred Elliott
J ennii Elliott
Ann Ellis
Marie Ellis
Holly Elvins
Bill Emery
Energy Developments Limited
Paul Erkine
Peter Evans
Roger Evans
Loris Ewert
J ocelyn Fair
Peter Desmond Fanning
Ghassan Farha
J ai Farrell
J anne Faulkner AM
Evelyn Fawcett
April Fay
Hamada Fayad
David Feldman
William Fenner
Betty Ferguson
J anine Ferguson & Graeme Ellen
Bart Fiblch
Thelma Fiddymont
The Finkel Foundation
Glenn Finkelde
M S Finlay
Helen Firth
J acqueline Fisher
Tony Fisher
Elizabeth Fitzgerald
M C Fleming
Randyl Flynn
Myles Foley
Arthur Ford
Foresters Friendly Society
David Forrest
Isolde Forstmann
Maria Fortier
Michael Fortier
Cathy Foster
J acqueline Frankhauser
George Freed
Shirley Fricke
Susila Frida
Inez Fripp
Marilyn Fry
Rosemary Fry
Gemma Furtado
J ohn Fylfield
Russell Fynmore
Susanne Gabor
Francis Gagliano-Ventura
Dorothea Gannon
Neima Gantner
F R Gardiner
Patricia Gardiner
The Gamsworthy Family
Kim Gasperino
Lesley Gerrish
Roshan Ghadamian
Peter Gilbertson
Edward Giles
Norman Gilmore
Gipton Family Trust
Mary Glover
Warren Gloury
R M Golding
The Goldsmith Family
Valmali Goller
Margaret Gonshor
Roland Good
Good Sirit Company Limited
Callum Goodall
J ohn Gordon-Kirkby
Kevin Gossip
Dirk Goudberg
Meree Gough
Louise Gourlay OAM
Patrick Gower
Ian Goy
Debbie Grace
Ian Graham
Peter Graham
Marilyn Grant
P Grantham
Gary Gray
The Gray Family
Charitable Trust
J osephine Green
P Green
Robert Grierson
Eileen Griffin
Betty Griffths
Evelyn Gross
Michael Grounds
Nancy Grover
Helen Groves AO
GS1 Australia
Roland Gubler
Andrew Gundlach
Patricia Guppy
Michael Guthtridge
Charles Gutjahr
J ennifer Gwynne
Lachlan Haig
Ann Hal
Veronica Hall
Shirley Halloes
J ames Hancock
Geoff and Helen Handbury Foundation
Hartley Hansen
Richard Harbig
Geoff Hardy
J ane Hargreaves
David Harper
David L Harper
Lucy Harper
Yvonne Harper
I da Hartwig
Brenton Hawkes
Helen Haynes
Carolyn Haywood
J amie Haywood
Margaret Haywood
Susan Hayes
Cayley Heim
Gordon Hellsten
William Henderson
Herbert Geer
Wilma Herschell
Thomas Hersz
Margaret Heselev
David Hewett
Harold Hibbert
Norma Hibbins
Gwen Hickford
Donald Higgins
Alistair Hillier
Anderson Hind
Thi Hoang
J anelle Hoban
Elaine Hobbs
Barbara Holden
Hamid Homayouni
Mamie Homewood
Peter Horwood
Geoffrey Hosking
Lindel House
Lesley Howard
Grace Howden
Margaret Howes
J oan Hoy
Colin Hughes
Allen Hulls
Keith Hutchison
Maria Huymans
Tammy Huynh
Bernadette Hyland
J oan Ikin
Inner Wheel Club of Bayside
Elaine Innes
Interiors Aeroservices Pty Ltd
Arnold Izzard
Margaret J ackson AC
Robert J ackson
David J acbson
Barry J ames
J illian J ardine
Andrea J effress
C lint J ells
Nola J ennings
H & K J ohnston
Family Foundation
Campbell J ohnston
Elizabeth J ones
J oan J ones
Mark J ones
Robert J ones
Peter J orpling QC
Brend J ordan
Matthew J oseph
Richard J uska
Sam Kahn
Mahesh Kalyan
Anne Kantor
Karingal
Neighbourhood Watch
Kavitha Kasyanathan
Margaret Kelleher
Kelvin Kellett
Bernard Kelly
Wilma Kemp
Stephen Kenmar
Fay Kent
Mary Kentish
Judy Kiefer
Joseph Kiern
Pamela Killer
Leslie Kilmartin
Nah-Mi Kim
Cornelia Kinstra
Francis King
Peter King
Stuart Kingsmill
Robyn Kingston
Terry Kinsella
Helen Kiriakis
Anton Kjer-Nielsen
KPMG
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Lew Kotler
Pradeep Kotha
Blaire Kowl
KPGM
Holly Kramer
Geoff Kroeker
Marie Ku
David La Fontaine
Isaac Lahav
Jillie Laidler
Alice Lamplough
Margaret Lancaster
Ross Land
Johann Landy AC MBE
James Lang
Natan Lange
Gina Langlands
Richard Large
Mary Latham
Johann Law
George Lawrence
Mel Lawson
Phu Le
Simon Le Maistre
Sayma Lederman
Margaret Ledley
Damien Lee
Lois Lee
Maxwell Lee
Geoff Levy
Marcel Levy
John Lim
Wei Jie Lin
Antonio Linossi
Edith Lipka
Bruce Lithgow
Brian Little
Algirdas Liubinas
M M Livermore
Winifred Livingstone
Chris Lloyd
Liz Longford
Elizabeth Loorham
Colleen Lord OAM
E N Lord
Heather Low
J Judith Lukies
Kevin Lucscombe AM
Frances Luxon
Eileen Lynn
Val Lyon
Sylvia Lyons
Michael Macgeorge
Michelle Machado
James Mackenzie
Scobie & Claire Makinson Trust
Belinda Maclay
Johna Maclay
Heather Macwhitter
Warren Madsen
Patrick Maguire
J anet Mahaffey
Vicky Malafouris
Susan Maletic
Tina Mallon-Davis
Madhu Manjari
Robert Manks
D Mann
Pilar Manovel
J Manonzi
Frank Marcaccio
Margaret March
March of Dimes (US)
Eric Margerets
Susan Markham
Arthur Marsh
Heather Marshall
Marjory-Dore Martin
Heather Mason
Kathleen Mason
Stephen Mason
J anet Mather
Mariam Matthews
Raymund Matthews
Tom Matthews
Christine Mavrodoglos
Shirley Mayes
J essie Mayo
David McAllister
Paul McAuley
Rex McConachy
Denys McCullough
Alison McDermott
David McDonald
Lois McDonald
John McDonell
J Ann McDonnell
Emmeline McFadyen
Albert McGill
Louricille McGinley
Katherine McGinley
A J McIntosh
Bruce McKenzie
B McLaren
Colin McLaren
Elizabeth McLaren
Ken McLaren
Donald McCleod
Alexander McMillan
Maggie McSweeney
David Meakin
R J Meggs
Rajesh Mehta
Melbourne University Publishing
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J Judith Middlemass
Michael Milo
Bruce Miller
J ohn Milne
Roslyne Milne
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Etheil Mirams
Francesco Mirenzi
David Michell
Harold Mitchell Foundation
Heather Mitchell
J anis Mitchell
Lyn Mitchell
Heather Mutchener
Graeme Moir
Noel Moline
Timothy Molloy
Graham Moore
Isobel Moore
Martin Moore
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Karen Moretz
Geoffrey Moritz
Patricia Morrice
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Diane Moser
Shirley Mottram
J udy Mounsey
N B Morrow
Hazel Moyes
MS Research Australia
Angela Mulloy
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Edward Muntz
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DBE
Thomas Murphy
Estate of the late Yasuko Myer
Thi Ngoc Nam
B J Nankervis
Nano Technology Systems
Elaine Nassau
Graeme Nation
Margaret Neely
Robert Neeter
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Nelson Alexander
Charitable Foundation
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J anet Newman
Richard Ng
Siew-Hoon Ng
Nick Ngai
Amanda Ngo
J ulie Nguyen
Michael Nguyen
Philippa Nihill
J ohn Nixon-Smith
Raimond Nogetse
Helen Nolan
Denise Norman
Heather Novak
Barry Noy
Thapelo Oageng
Justine Paragreen
Kara Papioannou
I J Odgers
Ash Paton
Vivienne Player
Roland Piess
Allan Pogonowski
Kurt Pollitzer
The Ian Potter Foundation
Primrose Potter AC
Audrey Potts
Norah Powell
Jillian Pratt
The Pratt Foundation
V Pratt
Leonard Price
Jana Pringle
Jillian Pratt
The Pratt Foundation
V Pratt
J ohn Pugh
Ron Purdie
Anthony Pyman
Wilma Radnoll
Rae & Partners
Margaret Rafferty
Ash Ratnayake
FINANCIAL STATEMENTS
STATEMENT OF COMPREHENSIVE INCOME
FOR THE YEAR 1 JANUARY 2010 TO 31 DECEMBER 2010

<table>
<thead>
<tr>
<th>FLOREY NEUROSCIENCE INSTITUTES $’000</th>
<th>CONSOLIDATED GROUP $’000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INCOME STATEMENT</strong></td>
<td></td>
</tr>
<tr>
<td>Revenue from ordinary activities</td>
<td>1,138</td>
</tr>
<tr>
<td>Salary and employee benefits</td>
<td>(513)</td>
</tr>
<tr>
<td>Raw materials and consumables</td>
<td>(202)</td>
</tr>
<tr>
<td>Conferences and collaborations</td>
<td>(97)</td>
</tr>
<tr>
<td>Building maintenance</td>
<td>0</td>
</tr>
<tr>
<td>Research support services</td>
<td>(131)</td>
</tr>
<tr>
<td>General administration</td>
<td>(370)</td>
</tr>
<tr>
<td>Other expenses from ordinary activities</td>
<td>(96)</td>
</tr>
<tr>
<td>Distribution of grant funds</td>
<td>0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>(1,409)</td>
</tr>
<tr>
<td>Net operating surplus/(deficit) before depreciation</td>
<td>(271)</td>
</tr>
<tr>
<td>Depreciation</td>
<td>(11)</td>
</tr>
<tr>
<td>Net operating surplus/(deficit) after depreciation</td>
<td>(282)</td>
</tr>
<tr>
<td>Revenue contributed for future building costs and FNI activities</td>
<td>30,474</td>
</tr>
<tr>
<td>Expenses related to future building costs</td>
<td>(4,833)</td>
</tr>
<tr>
<td><strong>NET SURPLUS FOR THE YEAR</strong></td>
<td>25,359</td>
</tr>
</tbody>
</table>

The Florey Neurosciences Institutes consolidated group includes: Florey Neuroscience Institutes, Howard Florey Institute, Brain Research Institute, National Stroke Research Institute, Howard Florey Institute Foundation and Genvartec Pty Ltd

<table>
<thead>
<tr>
<th>ACTUAL $’000</th>
<th>% OF TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government and statutory bodies</td>
<td>19,778</td>
</tr>
<tr>
<td>Other peer review funding</td>
<td>4,149</td>
</tr>
<tr>
<td>Miscellaneous income</td>
<td>2,011</td>
</tr>
<tr>
<td>Private donors and foundations</td>
<td>3,473</td>
</tr>
<tr>
<td>Commercial collaborations</td>
<td>1,377</td>
</tr>
<tr>
<td>Investment income</td>
<td>2,352</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>33,140</td>
</tr>
</tbody>
</table>
### BALANCE SHEET
**AS AT 31 DECEMBER 2010**

<table>
<thead>
<tr>
<th></th>
<th>FLOREY NEUROSCIENCE INSTITUTES $’000</th>
<th>CONSOLIDATED GROUP $’000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current Assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash and cash equivalents</td>
<td>14,834</td>
<td>41,651</td>
</tr>
<tr>
<td>Trade and other receivables</td>
<td>2,001</td>
<td>4,117</td>
</tr>
<tr>
<td>Available for sale financial assets</td>
<td></td>
<td>11,656</td>
</tr>
<tr>
<td>Prepayments</td>
<td>24</td>
<td>189</td>
</tr>
<tr>
<td>Inventory</td>
<td>-</td>
<td>37</td>
</tr>
<tr>
<td><strong>Total Current Assets</strong></td>
<td>16,859</td>
<td>57,650</td>
</tr>
<tr>
<td><strong>Non-Current Assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Property plant and equipment</td>
<td>166</td>
<td>5,548</td>
</tr>
<tr>
<td>Assets under construction</td>
<td>96,318</td>
<td>96,318</td>
</tr>
<tr>
<td>Investments in associates</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total Non-Current Assets</strong></td>
<td>96,484</td>
<td>101,866</td>
</tr>
<tr>
<td><strong>TOTAL ASSETS</strong></td>
<td>113,343</td>
<td>159,516</td>
</tr>
<tr>
<td><strong>Current Liabilities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trade and other payables</td>
<td>4,492</td>
<td>4,935</td>
</tr>
<tr>
<td>Provisions</td>
<td>-</td>
<td>4,125</td>
</tr>
<tr>
<td>Other - unearned revenue</td>
<td>-</td>
<td>69</td>
</tr>
<tr>
<td><strong>Total Current Liabilities</strong></td>
<td>4,492</td>
<td>9,129</td>
</tr>
<tr>
<td><strong>Non-Current Liabilities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provisions</td>
<td>-</td>
<td>431</td>
</tr>
<tr>
<td><strong>Total Non-Current Liabilities</strong></td>
<td></td>
<td>431</td>
</tr>
<tr>
<td><strong>TOTAL LIABILITIES</strong></td>
<td>4,492</td>
<td>9,560</td>
</tr>
<tr>
<td><strong>NET ASSETS</strong></td>
<td>108,851</td>
<td>149,956</td>
</tr>
<tr>
<td><strong>Funds</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retained surplus</td>
<td>108,851</td>
<td>123,713</td>
</tr>
<tr>
<td>Unrealised investment reserve</td>
<td>-</td>
<td>49</td>
</tr>
<tr>
<td>Merger/reorganisation reserve</td>
<td>-</td>
<td>26,194</td>
</tr>
<tr>
<td><strong>TOTAL FUNDS</strong></td>
<td>108,851</td>
<td>149,956</td>
</tr>
</tbody>
</table>
Florey Neuroscience Institutes

PARKVILLE CAMPUS
Level 2, Alan Gilbert Building
161 Barry Street
Carlton South, Victoria
Australia 3053
Phone: +61 3 8344 1888
Fax: +61 3 9347 0446

AUSTIN CAMPUS
Neuroscience Building
Austin Health
300 Waterdale Road
Heidelberg West, Victoria
Australia 3081
Phone: +61 3 9035 7000

www.florey.edu.au

Florey Neuroscience Institutes is a public company limited by guarantee under the Corporations Act 2001.
ABN 92 124 762 027