PRINCE OF WALES MEDICAL RESEARCH INSTITUTE

annual report

annual report 2001/2002

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Prince of Wales Medical Research Institute

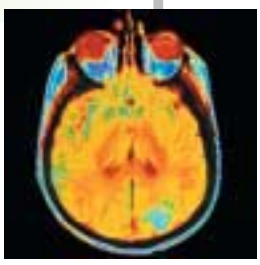
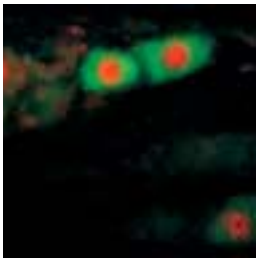
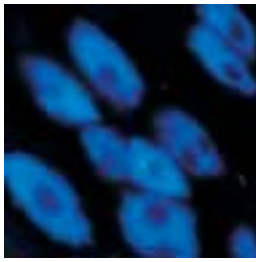
This Annual Report covers the scientific achievements of the Institute for the calendar year 2001, and lists all of its publications that appeared in that year. It gives details of research grants applied for and awarded in 2001 for expenditure through the year 2002. Financial information refers to the year ending 30 June 2002.

2001/2002

Princess Devaki Singh and the Maharana of Udaipur, Arvid Singh Mewar with Dr Stephen Lord.

contents

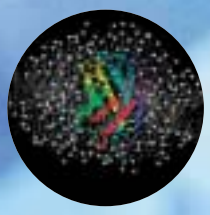
annual report

2001/2002

medical

The Prince of Wales Medical Research Institute is Australia's major independent site for research on the functions and disorders of the brain and the nervous system.



Location

The Institute is situated on the Randwick Hospitals' Campus in the eastern suburbs of Sydney, adjacent to the University of New South Wales' Kensington campus and its Faculty of Medicine.

History of the Institute

The Prince of Wales Medical Research Institute was formally established on the signing of a Letter of Agreement between the then Eastern Sydney Area Health Service, the University of New South Wales, and the Institute's founding group of scientists, in December 1990. The Institute was officially opened on 8 November 1993 by the New South Wales and Commonwealth Health Ministers of the day (The Hon RL Phillips and Senator G Richardson). Research and development commenced under the auspices of the Institute that same year. POWMRI Limited was registered as a public company limited by guarantee under the Corporations Law of New South Wales on 4 August 1993.

The Institute was awarded a $1.7M grant by the NSW Government in 1992, matching a capital works grant of $1.7M by the Commonwealth Government in 1991, for conversion of ward units to research laboratories. Since those grants, the Institute has raised substantial additional funding for capital works through its own fundraising activities. Together with the NSW and Commonwealth capital grants, the funds raised have been sufficient to complete both Stage I and Stage II works.

history

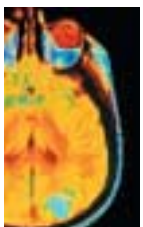
The Institute embarked upon the second stage of its Capital Works Program in early 1999. Building and refurbishment was completed in 2000, more than doubling the physical size of the Institute and housing state-of-the-art research laboratory and infrastructure facilities in one larger building formed by linking both sections. The front entry of the building overlooks the main entrance to the Randwick Hospitals Campus on Barker Street, opposite the Newmarket Stables.

The Official Opening of the second stage of the Institute was held on 15 November 2000, officiated by The Honourable Bob Carr, Premier of New South Wales. The Institute's namesake, His Royal Highness, The Prince of Wales, delivered a congratulatory message via video, praising the Institute on its growth since inception in 1993 and its excellent scientific achievements. Guests at the Opening, including the NSW Minister for Health, Craig Knowles, were able to visit many of the laboratories within the Institute, and scientists gave short presentations on current research being conducted within their area of research.

Some of the facilities incorporated in the new development include a Physical Containment Level Two (PC2) laboratory for work on human brain tissue and a Spinal Injuries Research Centre which has been set up with five new laboratories and associated office space dedicated to specific research in this area. All research work is conducted on the premises and includes work on nerve conduction, nerve degeneration and regeneration, neuropathology, and human autonomic and sensorimotor function. The Institute consults with the spinal injuries clinical centres at both Prince Henry and Royal North Shore Hospitals, and has support for collaborative joint programs that would draw together the clinical opportunities there with the research expertise at the Institute.

The Institute has grown rapidly to become Australia's largest single centre for research on the functions and disorders of the brain and nervous system. Its scientific recruits are highly qualified career researchers who usually bring their own salaries as components of peer reviewed research grants, creating an environment conducive to further recruitment and expansion.

The Institute conducts Australia's major research into human balance and coordination, including the major national program of research into the causes of falls in older people. The Institute houses the largest national (and one of the world's 5 or 6 largest) 'brain banks' where the invaluable resource of bequeathed brains of patients with a range of conditions under study are held, together with complete clinical records of the patients themselves. The Institute has an established record of leadership in the area of nerve injury, degeneration and regeneration, and the Spinal Injuries Research Centre is being



developed further to cover all aspects of this devastating condition. Major and highly distinguished research programs are also in place on pain mechanisms, chronic pain, and on back pain in particular; on child injury, on neurodegenerative disorders; on macular degeneration and blindness; and on neural regulation of autonomic function and breathing.

The Institute now stands at the brink of a new period of rapid growth and development as it occupies its greatly expanded facilities and draws upon and extends its proven scientific strengths. Its standing and achievements have placed important responsibilities upon it, and it now stands ready to meet those.

Governance and Directorship

The Institute is an independent non-profit company ABN 94 050 110 346.

The Institute has a formal affiliation with the South Eastern Sydney Area Health Service and the University of New South Wales. The two organisations are represented equally on the Institute's Board of Directors.

The Board is also comprised of eminent community and business leaders. Its Chairman is Dr. Don Grimes AO, who is also Chairman of the South Eastern Sydney Area Health Service.

The Executive Director of the Institute is Professor D Ian McCloskey AO FAA FTSE FRACP. Professor McCloskey is an expert on human movement and balance, and cardiovascular regulation. His past appointments include: Chairman of the Medical Research Committee of the National Health and Medical Research Council; member of the Commonwealth Government's Coordination Committee on Science and Technology; member of the Council of the Australian Academy of Science; and President of the Australian Neuroscience Society.

Funding Sources

NSW Health Infrastructure Grant

Under the current triennium of the NSW Health Department R&D Research Infrastructure Program (2000-2003), the Institute receives $1.39M per annum. It qualifies as the second largest of the six large independent institutes recognised under Stream 1 of the Program.

Research Grants

The Institute attracts competitive external grant funding from a number of national and international organisations every year. Total peer-reviewed funds for 2001 were $5.5M. The most significant funding body is the National Health and Medical Research Council. NHMRC funding to the Institute has increased steadily despite the competitiveness in acquiring such peer-reviewed research grants. In 2001, NHMRC grants income was $4.01M. This income includes an NHMRC Program Grant for Experimental Neurology ($1.01M in 2001). It also includes an NHMRC Partnership in Injury Grant (a total of $2.6M over the period 2001-2005).

The Institute is an independent non-profit company

grants

Dr Claire Shepherd

research

The RRA Scheme is intended to facilitate R&D activity with other organisations, an increasingly important focus of the Institute's research directions.

While the NHMRC continues to be a major source of research funding, Institute researchers have also been active in seeking research funds from other sources, such as the Australian Research Council, Commonwealth Department of Health and Aged Care, Wellcome Trust (UK), Australian Brain Foundation, Motor Accidents Authority of NSW, Australasian Spinal Research Trust, The Christopher Reeve Paralysis Foundation, Clive and Vera Ramaciotti Foundations, Sylvia and Charles Viertel Foundation, The Menzies Foundation, Gerontology Foundation of Australia, and National Stroke Foundation. Funding from non-NHMRC sources has become more diverse over the last few years. Such funds play a very important role in the Institute's work and are becoming vital in an increasingly competitive market for funds to support research.

Publications

The Institute continues to have a strong publications record, with a total of 94 fully refereed works published in 2001. This figure does not include the Institute's extensive record of conference proceedings and abstracts, nor does it include works "in press".

Fundraising

As a not-for-profit company the Institute holds an "Authority to Fundraise for Charitable Purposes". The incorporated body POWMRI Limited supports the Prince of Wales Medical Research Institute through its Board Finance Group and various public relations and fundraising activities are conducted throughout the year.

The Board of the Institute and its staff recognise that the Institute's work must be supplemented by funding from sources other than those mentioned above for the Institute's work to proceed optimally.

Recognition of Board Members and Staff

In 2001, Professor Elspeth McLachlan, a senior scientist at the Institute, took up the prestigious appointment as Pro-Vice-Chancellor (Research) at the University of New South Wales, while maintaining her research on the autonomic nervous system at the Institute.

Institute scientist, Dr Stephen Lord was appointed Associate Professor (NHMRC Principal Research Fellow) in 2001. The Institute now has seven staff at professorial level and two at associate professorial level.

Two Institute scientists, Dr Marcus Stoodley and Dr Kay Double were selected as "2001 NSW Young Tall Poppies" by the Australian Institute of Political Science because of the outstanding quality and breadth of their scientific work.

There are currently four Fellows of the Australian Academy of Science on the Institute staff: Professors Ian McCloskey, David Burke, Simon Gandevia and Elspeth McLachlan. Two of the Institute's staff are former Presidents of the Australian Neuroscience Society; three have been awarded the major national prizes recognising excellence in medical research (the Wellcome and Ramaciotti Awards); and three of the Institute's senior scientists have been made Officers in the Order of Australia (AO) for their services to neurological science. Also, members of the scientific staff occupy senior positions in national and international organisations concerned with nervous system function and dysfunction.

In November 2001 Dr George Mammen joined the Prince of Wales Medical Research Institute in the newly-created post of Chief Operating Officer. Dr Mammen has a wealth of knowledge and experience in the fields of medical publishing, drug development, clinical research, marketing, business development and management. With a PhD in

The Intellectual Property of the Neuropeptide Y compound was successfully transferred to the Institute from the CRC for Biopharmaceuticals which was wound up.

Pharmacology, an MBA and a Bachelor of Science (Hons), Dr Mammen will play a vital role in the expansion of the Institute.

Dr Mammen has most recently been General Manager and Vice-President of Discovery International Australia. Prior to this, he held diverse positions in healthcare, including Editor of the International journal Clinical Pharmacokinetics, Clinical Research Manager for Astra, Associate Director of Scientific Affairs for Schering-Plough, Group Product Manager and Business Development Manager for Hoechst Marion Roussel.

Commercialisation of Research

Further to its recognition as an Approved Research Institute by the Department of Human Services and Health, POWMRI is also a Registered Research Agency (RRA) under the Federal Government's RRA Program (registration number 30945). The RRA Scheme is intended to facilitate R&D activity with other organisations, an increasingly important focus of the Institute's research directions.

Commercialisation is a new venture for the Institute and there has been some success to date. In November, a collaborative agreement between GlaxoSmithKline (Europe) and the Prince of Wales Medical Research Institute was signed. Under the terms of the agreement, Institute scientist, Scientia Professor George Paxinos will complete a project on "Generation of electronic mouse brain atlas based on histologic and MRI images for application on gene expression mapping and pharmacofMRI of the rodent brain" and provide consultancy services to Glaxo scientists.

The Intellectual Property of the Neuropeptide Y compound was successfully transferred to the Institute from the CRC for Biopharmaceuticals which was wound up. Neuropeptide Y is a novel compound which has the potential to become a new treatment for nasal congestion. A US patent has been granted. Discussions have commenced with several multinational pharmaceutical companies to find a suitable partner to license, develop and market this compound.

Training and Education

Senior scientific staff of the Institute supervise postgraduate students from various schools of the Faculty of Medicine, University of New South Wales. This Institute actively supports both staff and students representing the organisation at relevant national and international conferences and symposia.

Dr Andrew Brodbelt

Dr McCullough has been the Patron of the Prince of Wales Medical Research Institute since 1994. She is an internationally renowned novelist

patron's message

Dr Colleen McCullough, Hon DLitt

Dr Colleen McCullough, Hon DLitt

Dr McCullough has been the Patron of the Prince of Wales Medical Research Institute since 1994. She is an internationally renowned novelist. Dr McCullough is also the Patron for The Gerontology Foundation of Australia, an Emeritus Consultant in Clinical Neurophysiology at Royal North Shore Hospital, and a former Chairman of the Norfolk Island Hospital Board.

"How proud I am of the Prince of Wales Medical Research Institute! And how proud I am to be its honorary titular head. Its list of achievements is formidable, which is splendid, but to me there are other, equally important aspects that warrant the public's continued and accelerated financial support.

"Chief of these is the fact that in having our own research institutes, we in Australia are finally offering our brightest citizens a chance to remain at home without hamstringing their research careers. Our nation is big enough now to take its place in the new millennium as a fully-fledged member of the world community, and that means funding our own research programs as much as it does offering less privileged new arrivals a place in the Australian sun.

"Keep up the good work, Ian and your team! My sincerest congratulations."

Governance & Directorship

Chairman's Message – Mr William Penfold, AM

With the second-stage development well settled, 2001 saw the Institute in a position to take advantage of enormous scientific opportunities to develop, maintain, and renew scientific advances in research that will eventually assure our countries' capability to prevent disease and reduce disability.

Although scientific accomplishments often take many years to unfold into new diagnostic tests and new ways to treat and prevent diseases, the confluence of this appropriation of scientific opportunity has already begun to yield amazing results.

The Board was certainly singular-minded as we set out to concentrate enough resources to enable a much greater number of people at the forefront of neurodegenerative research to work vigorously and to work collaboratively at the Institute, energizing and inspiring each other.

The Institute is recognised as a centre of excellence in research - one that is a leader in its field, with extraordinary depth and talent, and one which promotes collaboration among researchers around the world. Due to its enhanced reputation, a significant number of eminent researchers have chosen to come here this year, both as resident scientists and as visitors. They do not come because of the financial rewards, for to pursue a scientific career anywhere requires dedication to things other than those that money can buy. The motivations behind choosing this Institute are the scientific environment and the colleagues with whom they can interact.

An example of the regard in which our Institute is held, it is worth noting that, in 2001 visiting scientists came from France, Sweden, USA, UK, Canada, Denmark, Germany, China, Belgium and Brazil.

As reflected in the information presented in this report, our scientific achievements have been impressive and this is largely because our different research groups have added value to the total rather than operating as independent laboratories housed in the same building by chance rather than design. The principal investigators, supported by entrepreneurial leadership, will continue to be the bedrock of medical science. However, the teams that those scientists lead have become much larger and more complex because of the need for specialists in particular areas. The cross fertilisation of ideas and findings fosters an environment where fundamental creative discoveries, innovative research strategies and their applications provide a basis to advance the nation's capacity to protect and improve health.

The need to raise funds to support research is

always with us and, to this end, I am pleased to report on the overwhelming success of a fundraising dinner, initiated by Board Member Mr John Everett. 'An Evening in Rajasthan' was attended and supported by the Maharana of Udaipur, Arvind Singh Mewar and raised in excess of $350,000 for the Spinal Injuries Research Centre. Another event, 'An Evening with Tony Mowbray', the acclaimed single-handed, round the world yachtsman, was also a great fundraising success.

To all those who supported the Institute by attending these functions, to corporations, individuals, organisations, trusts and foundation and those who provided gifts in kind, my heartfelt thanks for your support. Your financial patronage enables new initiatives to be implemented and allows us to expand the knowledge base in neuroscience in order to enhance the 'well-being' of our research. This, in turn, ensures continued high return on the public investment in research. But it is vital to our future that we continue to forge new partnerships with the private sector, with those who can contribute not only financially, but also through their unique perspective and expertise.

Thank you, also, to our celebrated Patron, Dr Colleen McCullough, who is always very supportive of the work of the Institute, not only through her role as guest speaker at our events, but also financially through the donation of royalties from her book Roden Cutler,VC.

I take pleasure in offering the congratulations of all Board members to Executive Director, Professor Ian McCloskey and his scientific and administrative staff for the exceptional quality of research and support services which exemplify and promote the highest level of scientific integrity, public accountability, and social responsibility in the conduct of science.

Finally, I wish to thank all Board members for their willing and generous support, and for their valued leadership and advice throughout 2001. Their commitment to our vision and success is invaluable.

The Members of the board of directors

Mr William Penfold, AM

- Chairman of the Board, POWMRI Limited, 1991 – 2002
- Chairman of the Board Finance Group, POWMRI Limited, 1991 – 2002

[University of New South Wales nominee to the Board]

Mr Penfold AM retired as Director and Chairman of the Board of POWMRI Limited in April 2002. He is Chairman of WC Penfold Limited and Director on a number of other Boards.

Dr Don Grimes, AO MBBS HonFAFPHM FRACMA

- Director, POWMRI Limited, 1996 – present
- Chairman of the Board, POWMRI Limited, 2002 – present
- Chairman of the Board Finance Group, POWMRI Limited, 2002 – present

[South Eastern Sydney Area Health Service nominee to the Board]

Dr Grimes AO was appointed Chairman of the Board of POWMRI Limited in April 2002. He is also Chairman of the Board of South Eastern Sydney Area Health Service, Chair of AusHealth International and Director of Australian Institute of Political Science. He previously held ministerial positions in the Australian Government and was Australian Ambassador to the Netherlands.

Mr Donald Booth

- Director, POWMRI Limited, 1998 – present
- Member of the Board Finance Group, POWMRI Limited, 1998 – present

[Independent nominee to the Board]

Previously Chairman and Managing Director of Fredk H Booth & Son Pty Ltd, Chairman and Managing Director of Helendon Holdings Pty Ltd, Chairman and Managing Director of Industrial Chrome Group Pty Ltd. Mr Booth also held a number of executive posts within the wool industry.

Mr Paul Brassil, BEc LLB

- Director, POWMRI Limited, 1997 – present
- Member of the Board Finance Group, POWMRI Limited, 1997 – present

[Independent nominee to the Board]

Partner in the Tax Consulting Services Division of PriceWaterhouseCoopers and a Fellow of the Taxation Institute of Australia specialising in advising local and international clients within the manufacturing, media, property and professional service industries on income tax, remuneration planning and FBT matters.

Professor Roger Dampney, BSc PhD DSc

- Director, POWMRI Limited, 1998 – present

[National Health & Medical Research Council nominee to the Board]


Mr William Penfold


Dr Don Grimes


Mr Donald Booth


Mr Paul Brassil


Professor Roger Dampney


Professor Bruce Dowton


Mr John Everett


Ms Deborah Green


Professor Ian McCloskey


Mrs Andrée Milman


Professor John Niland


Mr David Thomas


Mr John Walton

Head of the Department of Physiology at the University of Sydney and an Honorary Consultant Physiologist at Royal North Shore Hospital. He is also a member of a number of Societies and Advisory Committees and was previously a Member of NHMRC Regional Grants Interviewing Committees and Member of NHMRC Assigners' Panel.

Professor Bruce Dowton, MBBS MD FACMG FRACP

- Director, POWMRI Limited, 1998 – present [University of New South Wales nominee to the Board]

Dean of the Faculty of Medicine at the University of New South Wales, he is an honours graduate in Medicine and Surgery from the University of Sydney and has trained as a paediatric geneticist in the USA where he directed the Division of Medical Genetics at Washington University and was Associate Vice Chancellor and Associate Dean for Medical Education.

Mr John Everett, AM BEc AASA

- Director, POWMRI Limited, 1993 – 2002
- Member of the Board Finance Group, POWMRI Limited, 1993 – 2002 [Independent nominee to the Board]

Mr Everett AM retired as a Director of POWMRI Limited in February 2002. He is Chairman of Undercoverwear Lingerie and has previously held a number of honorary positions with community and business organisations.

Ms Deborah Green

- Director, POWMRI Limited, 1997 – present [South Eastern Sydney Area Health Service nominee to the Board]

Chief Executive Officer of South Eastern Sydney Area Health Service, Ms Green is the current Vice President of the Australian Healthcare Association and holds an Honorary Appointment at the Faculty of Medicine, University of New South Wales.

Professor Ian McCloskey AO BSc(Med) MBBS DPhil DSc FAA FTSE FRACP

- Executive Director, POWMRI Limited, 1994 – present
- Member of the Board Finance Group, POWMRI Limited, 1994 – present

Foundation Director of the Prince of Wales Medical Research Institute, Professor McCloskey is currently Conjoint Professor of the School of Physiology and Pharmacology at the University of New South Wales and a Member of several Committees and Advisory Councils.

Mrs Andrée Milman

- Director, POWMRI Limited, 1993 – present
- Member of the Board Finance Group, POWMRI Limited, 1993 – present [Independent nominee to the Board]

A Consultant with MIA Pty Limited, her previous appointments include executive positions and directorships of several major corporations in Australia, Europe and USA where she received a number of awards for her business acumen.

Professor John Niland, AC MCom PhD FASSA

- Director, POWMRI Limited, 2000 – present [University of New South Wales nominee to the Board]

Vice-Chancellor and President of the University of New South Wales, he previously held the Chair in Industrial Relations and has served periods as Head of the School of Economics, Head of the School of Industrial Relations, and Dean of the Faculty of Commerce and Economics. He has also held extensive positions in corporate, government and community arenas.

Mr David Thomas

- Director, POWMRI Limited, 1997 – present
- Member of the Board Finance Group, POWMRI Limited, 1997 – present [Independent nominee to the Board]

Licensee and Proprietor in the hotel and hospitality industry, a Member of Royal Sydney Yacht Squadron and Dual Holdings, Cassilis NSW.

Mr John Walton, AM MBA BEc CPA FAIM

- Director, POWMRI Limited, 1991 – present
- Member of the Board Finance Group, POWMRI Limited, 1991 – present [South Eastern Sydney Area Health Service nominee to the Board]

Chairman of Walton Enterprises Pty Ltd, Deputy Chairman of the Australian Institute of Management, and a Director of Young & Rubicam Australia Pty Ltd, Capital Investments Pty Ltd, Lassiters Holdings, and Sydney Children's Hospital Foundation. He has also served as Chairman of a number of corporate and community boards, including the Eastern Sydney Area Health Service, Waltons Limited and the Australian Retailers Association.

Scientific Advisory Committee

Professor James Lance, AO CBE MD HonDSc FRACP FRCP FAA

- Professor Emeritus, University of New South Wales
- Consultant Neurologist, Institute of Neurological Sciences, Prince of Wales Hospital

Professor James McLeod, AO BSc(Med) MBBS DPhil DSc HonDU FRACP FRCP FAA FTSE

- Professor Emeritus, University of Sydney

Professor Stephen Redman, ME PhD DSc FAA

- Deputy Director, John Curtin School of Medical Research
- Head of Synaptic Transmission Group, The Australian National University

Professor Mark Rowe BPharm MSc PhD DSc

- School of Physiology and Pharmacology, University of New South Wales

our science

Executive Director's Report

The external Scientific Advisory Committee of Professors James Lance, James McLeod, Stephen Redman and Mark Rowe visited the Institute during 2001, their first comprehensive examination of the Institute's science since the Stage II works were completed. Their responses to our science were very positive indeed, and they made a number of constructive proposals for ways in which we might extend our existing work and develop new lines. Already, many of their proposals have been implemented, and others, particularly those regarding possible recruits to our cause, are being pursued.

The Spinal Injuries Research Centre within the Institute developed rapidly during this year, with five active laboratory groups working principally in this area, and others planned. This area of our work gained impetus from the very successful fundraising event "An Evening in Rajasthan" in May 2001, where the principal guest was His Royal Highness, Arvind Singh Mewar, the Maharana of Udaipur. Our scientific recruitments into this field were pursued energetically, and Dr Lynne Bilston, a senior biomedical engineer with expertise on nerve and spinal injury was recruited to begin work in the Centre early in 2002. Her work will be of major importance in the area of injury prevention and minimisation. Her recruitment was made possible through the generous financial support of a longstanding friend of the Institute, Mr Philip Goymour.

The outstanding work of two of the Institute's younger scientists, Dr Kay Double (Parkinson's and related disorders) and Dr Marcus Stoodley (neurosurgery) were named as "Tall Poppies" by the Australian Institute of Political Science.

Drs Matthew Kiernan and Jane Butler rejoined the Institute after periods of overseas study supported on prestigious NH&MRC C.J. Martin Travelling Fellowships. Dr Kiernan worked at the Institute of Neurology at Queen Square in London, and Dr Butler in the United States at the Miami Project to Cure Paralysis. Since their return, both have established their laboratories and research within the Institute.

By proposal of the Board of the Institute, the second storey addition to the Institute, linking the two former villa units that were joined in the Stage II building works, was named 'The O'Neil Wing'. The generous assistance of Mr Rodney O'Neil and his sister Janette O'Neil was recognised in this naming, and a small ceremony attended by members of the O'Neil family was held in November 2001 to formalise the naming.

The Institute's operations group was reorganised and strengthened during the year with the recruitment of Dr George Mammen as Chief Operating Officer. Dr Mammen has a PhD in pharmacology and an MBA, and experience in industry, and will oversee the Institute's operations, and particularly moves to develop commercial opportunities that can arise through its work. Ms Anne Graham joined the Institute as Public Relations and Fundraising Manager, and Ms Deborah McKay as Administration Manager. The organisational structure of the Institute has thus been brought into line with its rapidly achieved size, and the organisational group is exceptionally impressive.

Professor Ian McCloskey AO

"The Spinal Injuries Research Centre within the Institute developed rapidly during this year, with five active laboratory groups working principally in this area, and others planned. This area of our work gained impetus from the very successful fundraising event"

Dr Kay Double

Research Highlights

Neurobiology of peripheral nerve terminals

James Brock

In work published in the Journal of Physiology, Dr Brock and his team have directly demonstrated, for the first time, differences in electrical properties of two types of sensory nerve endings in the surface of the eye. This work used a novel recording approach developed by Dr Brock's laboratory and was undertaken in collaboration with Professor Carlos Belmonte from the Instituto de Neurosciencias, Universidad Miguel Hernandez-Consejo Superior de Investigaciones Cientificas, Alicante, Spain. In separate studies reported in Naunyn-Schmiedeberg's Archive of Pharmacology, Dr Brock and Todd Hardy studied the presynaptic mechanisms controlling of neurotransmitter release from sympathetic nerves. The findings support the previous suggestion that control of calcium entry into the nerves is the principal mechanism by which activation of presynaptic receptors regulate neurotransmitter release. However, the findings indicate that other mechanisms must also be involved.

The Sydney Older Persons Study: MRI and neuropathological correlates of brain function.

Tony Broe

The neurological and neuropsychological components of our field studies (Sydney Older Persons Study [SOPS] Wave 5) on neurodegenerative diseases commenced in 2001. Magnetic resonance imaging correlates of these studies are progressing well. Components of the dementia syndrome associated with dementia with Lewy bodies are being investigated with data from previous waves of SOPS.

In terms of gait studies, the relationship between cerebellar volume on MRI, gait ataxia and cognition is being examined. Motor slowing in normal elderly did not correlate with substantia nigra measurements on MRI suggesting the basis of gait slowing with ageing may be in other structures (e.g. pre-supplementary motor cortex). The relationship between memory and hippocampal size in normal elderly subjects was established on 3 measures of MRI hippocampal volumes.

Pathophysiological mechanisms in the control of human motoneurones

Jane Butler

At The Miami Project to Cure Paralysis, Dr Butler was studying changes in muscle fatigue, motoneurone excitability, and motoneuronal connections in people with chronic high level spinal cord injury. The studies aim to improve the force and endurance of paralysed and partially paralysed muscles. To these studies have shown excessive fatiguability of chronically paralysed thenar muscles compared to control non-paralysed thenar muscles even after optimisation of the stimulation protocol. In another study it was shown that fatiguability can be significantly improved by increases in muscle perfusion pressure, although not to the level of control thenar muscles. Dr Butler has also investigated some of the mechanisms underlying spasm and clonus in muscles that are paralysed after spinal cord injury.

Weakness in demyelinating disease

David Burke

Cecilia Cappelen-Smith completed her PhD studies on axonal excitability, focusing on studies in patients with inflammatory demyelinating polyneuropathies, and on the conduction block that can occur in demyelinated axons. This work, with David Burke, Satoshi Kuwabara and Cindy Lin has documented for the first time in human patients that natural activity can precipitate conduction block, and the reasons for this have been explored in further studies on the biophysical properties of motor axons in normal subjects and patients with the demyelinating polyneuropathy.

Causing motoneurones to misbehave

Simon Gandevia

During 2001 David Collins, David Burke and Simon Gandevia initiated work on the forces generated by human lower limb muscles when the motoneurones received unusual afferent and descending inputs. We showed that motoneurones could be put into an "unusual" state in which their total output was greater than predicted from their inputs. This state was capable of generating large involuntary muscle forces, up to 50% of maximum. The studies shed light on the operation of so-called "plateau" potentials within human motoneurones, and were published in the Journal of Neuroscience (21: 4059-4069). This work provides a robust method to examine these plateau potentials in human subjects and it may reveal the extent to which these potentials contribute to pathological changes in stroke and spinal cord injury.

Developing novel diagnostic methods for Parkinson's disease

Kay Double

In 2001 Dr Double coordinated a 30-strong team of Basic Scientists, Neurologists, Specialist Nurses and other professionals in the Sydney DEDCeL (Diagnosing Early Dopamine Cell Loss) study which aimed to develop novel diagnostic methods for Parkinson's disease. This study resulted in the patenting of a novel blood test for Parkinson's disease, as well as the development of a new imaging technique which is currently under investigation for diagnosis. Other results from the study, regarding the olfactory dysfunction characterising the disease and the risk factors associated with the development of the disorder are currently being prepared for publication.

As a Young Tall Poppy Awardee, Kay Double took an active part in the "Tall Poppies in Flight" program and travelled to primary and secondary schools in rural NSW to promote science as a career.

Dr Antony Harding

Mechanisms underlying neurodegenerative disorders

Glenda Halliday

Our work on neurodegenerative diseases has significantly progressed. We have completed the comparative analysis on basal ganglia and motor cortices in Parkinson's disease and progressive supranuclear palsy. Our work has found that, in addition to the dopaminergic substantia nigra, two other motor regions degenerate in Parkinson's disease - the caudal intralaminar thalamus and the pre-supplementary motor cortex. These regions are likely to contribute to the clinical symptoms of this disease, and particularly the response of patients to current treatment strategies. Our findings in progressive supranuclear palsy suggest that different brainstem, thalamic and cortical degeneration account for the symptoms of this disease.

We have now completed many studies on degenerative dementias. An enormous increase in intracellular stress in genetic forms of Alzheimer's disease is likely to contribute to the very early onset of disease in families. Our analyses of dementia with Lewy bodies has shown that the disease is significantly different to Alzheimer's disease. Specifically, cases with dementia with Lewy bodies have a florid dementia syndrome but do not have much cell loss or abnormal protein deposition in comparison to Alzheimer's disease. These findings suggest that significant neuronal dysfunction, rather than degeneration, underlies dementia with Lewy bodies, and our data showing a relationship between intracellular inclusions and visual hallucinations (which requires neuronal activity) supports this concept. We have been able to develop a new staging method for the analysis of disease severity for cases with frontotemporal dementia. This method will now allow us to evaluate cases at similar disease stages and therefore develop a better understanding of the pathogenesis of this dementia syndrome.

Dementia with Lewy bodies

Antony Harding

Over the past 12 months, research has been progressing on a number of fronts. As the Brain Bank co-ordinator, I have been busy with a steady flow of tissue donations over the past 12 months. My work has been concentrating on the neuropathology of dementia with Lewy bodies. Studies which have been completed include the analysis of the hippocampus in dementia with Lewy bodies, and a unique site of neuron loss was identified that was distinct from that which occurs in Alzheimer's disease. A study analysing the pathology associated with dementia in dementia with Lewy bodies resulted in the development of a new method for differentiating Parkinson's disease and dementia with Lewy body cases and identifying the cellular cause. More recently, a study has been completed identifying pathology in the amygdala associated with visual hallucinations. Studies currently under way are an analysis of family history of dementia and/or Parkinson's disease in an effort to identify any inheritance pattern for dementia with Lewy bodies. Preliminary results indicate that the inheritance pattern of dementia with Lewy bodies is similar to that for Parkinson's disease. Finally, initial investigations have started analysing the Magnetic Resonance Imaging scans of people involved in the Sydney Older Person's Study.

Common symptoms in Parkinson's disease

Jasmine Henderson

Dr Henderson and Associate Professor Halliday conducted a study in collaboration with Prof Youyu Lu and Prof Shaoshi Wang from the Dept. of Neurology, 1st People's Hospital University of Shanghai, China. Both professors came to the Institute to carry out the study in which we surveyed the prevalence of symptoms and signs in Parkinson's disease and age-matched controls. We found that two-thirds of 38 patients compared to only one of 32 controls had abnormal odour detection and that this occurred in many patients the first year of the disease. Insomnia was a common problem with elderly people in general, but other abnormalities of sleep such as restless legs and abnormal movements during sleep were far more common in Parkinson's disease, but generally occurred later, usually 3-5 years into the disease. In a pathological study performed by Dr Henderson and Associate Professor Halliday, we found that part of the motor thalamus, the ventrolateral posterior nucleus, degenerates in progressive supranuclear palsy. This area is critical for the normal activation of the motor cortices, so its loss in PSP may explain why these patients exhibit some parkinsonian features.

Neurotrophic factors and pelvic autonomic neurons

Janet Keast

We are interested in the changes that occur in pelvic autonomic pathways that control bladder, lower bowel and reproductive organs after nerve injury. In particular, we are trying to understand why some pelvic ganglion cells send out axon branches to nearby ganglion cells after losing their connections with the spinal cord. This "wrong" growth of axons is likely to cause significant problems in control of the pelvic organs. We have studied the expression of two types of nerve growth factor (NGF) receptor, trkA and p75, after damaging connections between pelvic ganglion cells and the spinal cord in rats. We found the surprising result that the p75 (but not trkA) is dramatically down-regulated after sacral but not lumbar nerve lesion. This is the first time that these receptors have been found to be affected so profoundly in a situation where the neurons themselves are not injured. This result was reported in the European Journal of Neuroscience. We are also investigating a different group of substances, the GDNF family, to determine whether they are necessary for the maintenance and growth of parasympathetic pelvic ganglion cells. This group of ganglion cells is particularly important for contraction of the bladder, penile erection, and secretions from the

Dr Janet Keast

reproductive organs. We are studying these organs and their autonomic nerve supply in various lines of knockout mice.

Steroid actions on autonomic and sensory ganglion cells

Janet Keast

We have performed a variety of studies to determine how normally occurring steroid hormones affect the adult autonomic nervous system. Using electrophysiological recording techniques to study single nerve cells from male rats, we found that many pelvic ganglion cells are continuing to undergo maturation a few weeks after birth, and don't reach adult form until after they have been exposed to testosterone at puberty. The next step is to try and identify the exact way in which hormones affect nerve cell excitability, and if changes in the nervous system that may occur because of hormonal disturbances can be "rescued" later in life.

The effects of hormones on adult pelvic ganglion cells is also being studied in cultures, where we can look in more detail at the biochemical changes in the nerve cells. As reported in *Neuroscience*, we have found that testosterone can cause major changes in neuropeptide expression and neuron growth, and that it can also strongly inhibit the growth-promoting effect of nerve growth factor. This provides a clue that there might be a complex network of communication between different growth-promoting agents in these neurons.

A third study on hormones has investigated the way in which estrogens may affect bladder function and pain in females. We have found that almost a half of the sensory neurons that innervate the bladder express receptors for estrogens. Many of these neurons make the vanilloid receptor, so are involved in the sensation of pain. We are now studying how estrogen may affect pain sensitivity in these neurons, using rat models.

Axonal excitability and the pathophysiology of neurological disease

Matthew Kiernan

The term 'axonal excitability' can be used in a general sense to encompass the physiological responsiveness of nerves, dependent on the activity of a variety of ion channels, energy-dependent pumps and ion exchange processes that underlie membrane potential and are activated in the process of impulse propagation. With a better understanding of ion channel physiology and function, there arise important therapeutic implications for neurological disease, as pharmacological manipulation of these channels and pumps may provide new therapeutic strategies for neurological disorders. Nerve excitability techniques are being used at POWMRI to study patients to determine the cause of nerve dysfunction associated with a number of disorders including renal failure, diabetes, demyelination and spinal cord injury (the latter in collaboration with Dr Vaughan Macefield). Collaborative studies with Dr David Mowat (medical genetecist, Sydney Children's Hospital) are investigating disease mechanisms into inherited childhood nerve and muscle disorders. Further studies with Dr Geoff Isbister (toxicologist, NSW poisons centre) have led to a successful collaboration exploring the mechanisms of paralysis following envenomation.

Visual risk factors for falls

Stephen Lord

A study was conducted to determine the most predictive tests of falls in community-dwelling older people from a range of visual screening tests (high and low contrast visual acuity, edge contrast sensitivity, depth perception and visual field size). Older people who fell during the study follow-up period had decreased vision as indicated by all visual tests, with impaired depth perception, contrast sensitivity and low contrast visual acuity the strongest risk factors. Subjects with good vision in both eyes had the lowest rate of falls, whereas those with good vision in one eye with only moderate or poor vision in the other had elevated falling rates - equivalent to those with moderate or poor vision in both eyes. The study findings indicate that impaired vision is an important and independent risk factor for falls. Adequate depth perception and distant edge contrast sensitivity, in particular, appear to be important for maintaining balance and detecting and avoiding hazards in the environment.

Ref: Lord SR, Dayhew J. Visual risk factors for falls. J Am Geriatrics Society 2001;49:508-515.

Neuroinflammation after nerve and spinal cord damage

Elspeth McLachlan

Abnormal firing in sensory nerve cells is thought to be responsible for chronic neuropathic pain and abnormal reflexes after nerve and spinal cord injury. The neuroinflammatory effects of peripheral nerve injury are being investigated in sensory ganglia and in the damaged nerve trunk in rats. Our first discovery was that T-lymphocytes as well as macrophages invade the ganglia in response to a distant lesion within a few days. These immune cells may be responsible for releasing cytokines which can increase cell excitability leading to abnormal firing and then pain sensations which are not directly related to the injury. We are trying to identify what signals make the cells invade the ganglion from the blood and spinal fluid so that this can be prevented from happening. A second effect of injury is that blood vessels in the damaged nerve become enlarged and densely innervated by sympathetic nerve endings. This finding may provide an explanation for the involvement of sympathetic activity in these pain syndromes. In another project, we found that exactly the same types of inflammatory cell appear in the lumbosacral cord after upper thoracic spinal cord lesions in rats. In the lumbosacral cord, these pathological changes may contribute to the growth of abnormal connections and hyperreflexia after spinal cord injury.

Dr Peregrine Osbourne

Reflex input in the control of human motoneurones

Vaughan Macefield

Vaughan Macefield and Penelope McNulty continued their studies into the synaptic coupling between sensory endings in the skin (cutaneous afferents) and human spinal motoneurones, in which they showed for the first time that the input from a single cutaneous afferent from a finger is sufficiently strong to facilitate the ongoing EMG of a muscle acting on that finger (McNulty, Turker & Macefield, Journal of Physiology 1999 518: 883-893). In their recent work they showed that this synaptic coupling is particularly strong from two classes of cutaneous afferent (FAI & SAII), suggesting a strong roles for these sensory endings in motor control. Moreover, they showed that the input from single sensory endings from muscles (muscle spindles) caused no time-locked variation in EMG. Given that muscle spindle afferents are classically awarded a primary role in the reflex control of muscle activity, this suggests that - at least for the hand - sensory endings in the skin are more important in this regard, providing spinal amplification of cortical motor output. It remains to be seen whether these patterns of reflex facilitation are changed following stroke (when motor commands form the cortex are weak), and whether they can be demonstrated between sensory endings in the foot and the muscles of the leg.

Firing properties of single muscle vasoconstrictor neurones during controlled increases in sympathetic drive

Vaughan Macefield

To better understand the means by which muscle vasoconstrictor drive is graded in physiological and pathophysiological states Vaughan Macefield and Robin Callister (Faculty of Medicine, University of Newcastle, NSW) used changes in body position to increase or decrease muscle sympathetic nerve activity (MSNA) in a controlled fashion. It is known that the overall MSNA increases in a linear fashion as the body angle increases from a horizontal to a vertical position (which prevents the fall in blood pressure on standing). By recording from single muscle vasoconstrictor neurones during passive tilt of awake human subjects they provided direct evidence that the progressive recruitment of silent muscle vasoconstrictor neurones is the primary means of increasing the amplitude of a muscle sympathetic burst - neurones were recruited at certain angles and decrecruited as the angle decreased, but their propensity to fire primarily only once per sympathetic burst was preserved.

Assessing sympathetic outflow in spinal cord injury

Vaughan Macefield

One of the problems in spinal injury is the lack of control of blood flow in the paralyzed limbs and poor control of blood pressure. Mikael Elam (University of Gothenburg, Sweden) and Vaughan Macefield reassessed earlier studies by Prof. Gunnar Wallin, in which attempts were made to record sympathetic neural traffic to the paralyzed limbs in patients with spinal injury. In the recent studies, when the investigators managed to enter the nerve they confirmed the overall quiescence in sympathetic activity in high thoracic/cervical lesions, but the preservation of sympathetic traffic in low thoracic lesions. Interestingly, they also showed that the peripheral nerve appeared to exhibit axonal atrophy - in which electrical activation of the nerve failed to excite the paralyzed muscles. This had been overlooked in the earlier studies, because they only selected those patients in whom the peripheral nerves had been shown to be intact by electrophysiological assessment.

Control of muscles in intact people and those with spinal cord injuries

Peter Nickolls

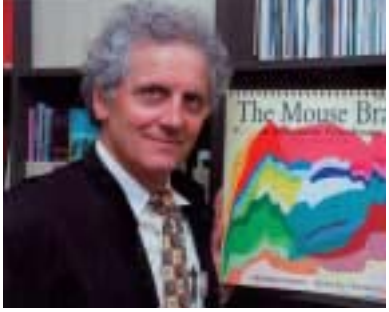
A series of experiments on humans where muscles were directly stimulated electrically showed that under some circumstances, using multiple electrodes stimulated one after the other (asynchronous stimulation), more power could be obtained from the muscle. The mechanism was shown to be due to pre-loading unstimulated muscle by other contracting regions of muscle. This mechanism is a well-known one. It had previously been thought that the increased power that was sometimes seen with asynchronous stimulation was a newly discovered mechanism.

Plateau-like behaviour is a phenomenon seen in motoneurones, and many other parts of the central nervous system, whereby motoneurones can continue firing for a short time after stimulation of them via other nerve fibres ceases. Human studies over the last 12 months have shown that this behaviour can be induced in the isolated part of the spinal cord in patients after spinal cord injury (SCI), although not as easily as in intact people. This is of interest as it may be a more efficient way of restoring movement artificially through electrical stimulation rather than direct stimulation of paralysed muscles.

Why do animals (including humans) stay addicted to drugs?

Peregrine Osborne

Our group is attempting to understand the compulsion that drives addicts to take drugs. We are using two approaches in our studies. The first uses rat brains to study how drugs related to heroin affect the function of nerve cells and to measure how these effects change over time as the animals become addicted. The second is to identify and study brain pathways that cause the behavioural changes that develop during addiction. We can do this by using tags that label neurons that are switched on by different types of addictive behaviour. Once the experiment is complete, we can look for these tagged neurons in brain sections, which allows us to map regions that produce different kinds of addictive behaviour. We are using this approach to study the role of the amygdala in addiction. This brain region coordinates emotional responses and outputs and may have a very important role in addictive behaviours



Professor George Paxinos

that cause addicts to relapse after they have successfully stopped taking drugs.

Maps to navigate the brain of humans and experimental animals

George Paxinos

We are collaborating with researchers nationally and internationally to produce accurate maps and 3D conceptual stereotaxic space to enable neuroscientists to navigate the brain of humans and experimental animals to test hypotheses inspired by human considerations and relate data from experimental animals to humans.

We are establishing the correspondences (homologues) between the human brain and that of experimental animals so that those studying models of human disease in animals can relate their observations to the humans. Additionally, we are producing the atlases used internationally to study the human brain. Imaging techniques now allow visualisation of the living brain. However, researchers and clinicians require the equivalent of a street directory for the brain, and it is these references atlases that are being constructed at the Institute.

The group is taking advantage of modern molecular techniques to stain the human brain in a way that its structure is revealed. They detect the presence of neurotransmitters and enzymes at the protein level (immunohistochemistry) and at the mRNA level (in situ hybridization). They use the distribution of these substances as a guide to brain organisation. Two of the areas of the human brain where the group is paying special attention are the autonomic (including cardiovascular) control areas and the cortex.

Role of neuropeptides in cardiovascular control

Erica Potter

We have continued to look at the role of neuropeptides in the control of blood flow and heart rate. We have looked at the role of the neuropeptides , neuropeptide Y (NPY) and galanin in modulation of parasympathetic activity in the guinea pig trachea, in vitro, and in the heart of rats and mice. As with our earlier studies in the dog we have shown in these models that parasympathetic neurotransmission is inhibited by neuropeptide Y by acting on presynaptic NPY Y2 receptors. We have also begun to use mice that have been genetically modified. Separate groups of mice that have had the genes deleted for the NPY Y2 receptor, the NPY Y4 receptor, the Gal1 receptor and the production of galanin are being studied to see whether these receptors play a role in control of heart rate as proposed by our earlier work in other species. We have also begun to see whether neuropeptide Y can modulate noradrenaline release presynaptically, in vitro, in mesenteric, carotid, cerebral, and femoral blood vessels of guinea pigs. Guinea pigs are being used initially as the neurotransmitter content of nerves is most thoroughly characterised in guinea pigs.

Macular degeneration

John and Shirley Sarks

Age-related macular degeneration is the major cause of legal blindness in the Western world and the earliest manifestation of the disease is the presence of soft drusen (seen as yellowish subretinal deposits with indistinct borders). Soft drusen contain membranous debris. However, this debris can be identified before drusen appear as a diffuse layer beneath the retinal pigment epithelium, unrecognised clinically. Eyes previously submitted to clinicopathological correlation and showing all stages of macular degeneration are therefore being re-examined to try to correlate quantitatively, utilising point counting, the formation of this material with the progress of the disease.

One entity, termed adult vitelliform degeneration, is characterised by the formation of yellowish material which is different to drusen, but the nature of this material and its location have been disputed. It has been thought to lie beneath the pigment epithelium like drusen, but our studies have shown that it consists of disrupted lipofuscin-containing retinal pigment cells lying anterior to, and not behind, the pigment epithelium. This study has been submitted for publication to EYE: Title: Adult Vitelliform Macular Degeneration: A Clinicopathological Study.

Pathology and treatment of post-traumatic syringomyelia

Marcus Stoodley

Following on from work demonstrating that cerebrospinal fluid (CSF) flows from the spinal subarachnoid space into syringes via perivascular spaces, current research is examining CSF flow in models of post-traumatic syringomyelia and the effects of altering compliance and subarachnoid space pressure on CSF flow and syrinx formation. Significant progress has been made in trying to understand the pathophysiological mechanisms in syringomyelia. An animal model has been developed and characterized. MRI images of the animal can reveal the presence or absence of a syrinx. In this animal model fluid flow experiments have demonstrated that the majority of fluid getting into the syrinx arises form the subarachnoid space and travels along perivascular spaces. There is also some evidence of fluid leakage from the syrinx. This work allows a basis for examining the effects of common treatment strategies on this fluid flow and trialing novel treatments such as stem cell implantation.

Molecular biology of brain blood vessel malformations

Marcus Stoodley

This project involves an analysis of endothelial molecular changes during development of arteriovenous malformations in an animal model and in human malformations and the effects of gene transfer therapy and radiation on these changes. The aim is to augment the effectiveness of radiation in the treatment of these lesions, by using gene transfer technology and temporal and spatial localisation of expression of radiation sensitisers.

Collaborations, Visitors, Guests

International Collaborations

- **Dr Kaarin Anstey** collaborates with Dr Hofer and Dr Piccinin from Pennsylvania State University where she is an Adjunct Research Associate Professor to undertake longitudinal statistical modelling investigations of Australian Longitudinal Aging studies.
- **Dr James Brock** and his colleague Dr Billy Dunn, University of Nottingham, UK. have been investigating the neural control of small arteries in a collaborative project funded by The Wellcome Trust. In 2001 Dr Brock spent a period of three weeks in Nottingham investigating the effects of blood pressure on the responses of blood vessels to activation of their sympathetic nerves. In December 2002, Dr Dunn made a return visit to the Institute to continue a study investigating the effects of activating primary afferent nerves supplying mesenteric arteries.
- **Professor Tony Broe's** collaboration with Professor John Hodges from the MRC Cognitive and Brain Sciences Unit at Cambridge University on clinical aspects of fronto-temporal dementia through his PhD students, was continued in preparation for his sabbatical at POWMRI in 2002. He also collaborates with Professor James Anthony of Johns Hopkins University, Baltimore in preparation for epidemiological studies to be carried out in 2002.
- **Dr Jane Butler** worked at The Miami Project to Cure Paralysis University of Miami, USA as a post-doctoral research associate with A Prof C K Thomas. In Miami she was also fortunate to collaborate with Dr E Ribot-Ciscar from the University of Provence, Marseille, France and Dr I Zijdewind from the University of Groningen, Groningen, The Netherlands. Publications as a result of international collaboration were published with Prof A S Paintal and Dr A Anand from the Vallabhbhai Patel Chest Institute, Delhi, India, (P23), Dr A Ledebt from the Faculty of Human Movement Sciences, Vrije University, Amsterdam, Dr V Marchand-Pauvert from the Neurophysiologie Clinique, Rééducation, Hôpital de la Salpétrière, Paris and Prof J B Nielsen and Dr N T Petersen from the Panum Institute, Copenhagen, Denmark.
- **Dr Kay Double** collaborates with international colleagues in Germany, particularly at the University of Würzburg, as well as groups in Israel, Italy, Japan and America. These collaborations have been fruitful to advance her work studying the structure of human neuromelanin pigment and also in establishing an international clinical study which aims to develop diagnostic methods for preclinical Parkinson's disease.
- **Dr Richard Fitzpatrick** and **Dr Stephen Lord** spent two weeks with Dr Brian Day, Institute of Neurology, Queen Square, London, in June, 2001 working on a study on galvanic stimulation of the vestibular system. A/Professor Mark Rogers, Northwestern University, Chicago, visited POWMRI in October to work with Dr Fitzpatrick and Dr Lord on a study of the determinants of choice reaction time stepping. Dr Stephen Lord is an Associate Investigator on a Falls prevention study being conducted by Dr Karim Kahn, University of British Columbia, Vancouver.
- **Professor Simon Gandevia**, **Dr Janet Taylor** and **Gabrielle Russell** collaborated with Tibor Hortobagyi, East Carolina University, North Carolina, USA in a study of the reflex effects exerted from one side of the body on the other side. These "crossed" reflex effects may have important effects on normal motor function and in its recovery following a deficit. Professor André De Troyer, Erasme University Hospital, Brussels, Belgium undertook a long-term collaborative program of work with Simon Gandevia and Robert Gorman. They are studying the activation of human intercostal muscles with the aim to determine how the brain regulates the control of these muscles according to their particular mechanical advantage for breathing.
- **Associate Professor Halliday**, **Drs Melissa Broe** and **Claire Shepherd**, collaborate with Professor David Mann at the University of Manchester, England, Dr Wei-Ping Gai at The Centre for Neuroscience, Flinders University of South Australia, and Drs David Howells and Andrew Hughes at the Austin Repatriation Medical Centre, Melbourne, Victoria on protein solubility and deposition in patients with Parkinson's disease, dementia with Lewy bodies, Alzheimer's disease and controls. A/Professor Halliday collaborates with Professor Gerald Munch at the University of Leipzig, Germany on the carbonyl stress response in genetic forms of Alzheimer's disease. In association with Dr Jillian Kril, A/Professor Halliday also collaborates with Professor John Hodges from the MRC Cognitive and Brain Sciences Unit at Cambridge University, England on the pathogenesis and progression of frontotemporal dementia. Professor Hodges is spending 2002 in the Halliday laboratory at POWMRI.
- **Dr Jasmine Henderson** collaborates with Professor Manfred Gerlach from the University of Wurzburg, Germany, in a study of behavioural and neurochemical correlates in parkinsonian rats.

- **Dr Janet Keast** is collaborating with two leaders in the field of neurotrophic factors, Professor Jeff Milbrandt, Washington University, St Louis and Dr Matti Airaksinen Helsinki University, Finland, in a study on neurotrophic factors for pelvic parasympathetic neurons. This has included importing genetically modified mice from each of these collaborators and setting up breeding colonies. Dr Keast also visited the biotechnology arm of the Karolinska Institute (Stockholm), Department of Biosciences at Novum, where she discussed a collaborative research project on estrogen receptors in the autonomic system with Professor Jan-Åke Gustafsson, a world leader in the area of steroid receptor biochemistry.

- **Dr Matthew Kiernan** returned to the Institute on a CJ Martin Travelling Fellowship from the NHMRC, having spent two years with Professor Hugh Bostock, FRS at the Institute of Neurology, Queen Square, London, UK. Dr Kiernan's work with Professor Bostock has helped cement a long-standing collaboration, resulting in many joint papers on axonal excitability.

- **Dr Yuri Koutcherov** and **Professor George Paxinos** are collaborating with scientists at the University of Duesseldorf, Germany to produce maps of the human hypothalamus, and are also near completion of a comparative and developmental study of the medial preoptic hypothalamic area, which is thought to control sexual behaviour of the human and the rat.

- **Dr Vaughan Macefield** hosted three international sabbatical visitors during 2001. Professor Mikael Elam, from Sahlgrenska Hospital, Gothenberg, Sweden, in his second visit to the Institute, spent three months in Dr Macefield's laboratory, studying the loss of sympathetic control of blood pressure, skin blood flow and sweating in patients with spinal-cord injury, also studying the recruitment properties of single muscle vasoconstrictor neurones. From the same department, Dr Yrsa Bergmann Sverrisdottir, commenced a two year postdoctoral period with Dr Macefield and has been working on the possible existence of sympathetic modulation of muscle spindles and studying the effects of asphyxia on the firing properties of single sympathetic (muscle vasoconstrictor) nerve fibres in human subjects. Associate Professor Vickie Galea, from McMasters University, Canada, spent three months at the Institute to learn about microneurographic recordings from single cutaneous and muscle afferents during finger movements in human subjects, a collaborative study with **Dr Penelope McNulty**.

- **Professor Elspeth McLachlan** maintains regular contact with Professor Wilfrid Jänig of Universität Kiel, Germany, and Dr Hiroe Inokuchi of Kurume University Medical School, Japan. Dr Inokuchi and Professor McLachlan are collaborating on a project on functional changes in the sacral cord in spinal cord injured rats.

- In a collaboration with The Montreal Neurological Institute and Boston University, **Professor George Paxinos** is constructing an atlas of the human cortex. In a collaboration with the University of Duesseldorf, Germany, Professor Paxinos is producing an atlas of the human brain. In a collaboration with the University of Murcia, Spain, he is mapping the avian brain, establishing the correspondences between birds and mammals. In a collaboration with GlaxoSmithKline in Verona, Italy and the Karolinska Institute, Stockholm he is reconstructing in 3D the mouse brain and constructing an MRI atlas of the mouse brain. He is producing an atlas of early mouse development in collaboration with the Universities of Duesseldorf and Murcia.

- **Professor Erica Potter** collaborates with Dr Silvain Lacroix at the University of Geneva who continues to test the effectiveness of an NPY Y2 (N-acetyl [Leu28, Leu 31] NPY 24-36) fragment created and patented at POWMRI, in patients with chronic vasomotor rhinitis. This is a double blind trial. Two doses of the peptide have been tested and a third is currently in progress. Professor Erica Potter has begun a collaboration with Dr Matthew Chapin of the Ophthlamic Research Associates, Boston, USA to test the Y2 peptide for its effectiveness in inflammatory conjunctivitis.

- **Dr Marcus Stoodley** collaborates with Professor R L MacDonald from the Section of Neurosurgery, Department of Surgery, Pritzker School of Medicine, University of Chicago Medical Center, Chicago, Illinois, USA in a study of molecular biology of brain blood vessel malformations.

- **Dr Janet Taylor** and colleagues undertook a collaborative project with Dr Karen Søgaard, National Institute of Occupational Health, Lersø Parkallé, Copenhagen, Denmark, with the aim of determining the changes in central nervous system and muscle function which accompany prolonged contractions at low force levels. The importance of studying these sustained weak contractions is that they are believed to contribute to a number of "overuse" syndromes.

- **Dr Jian Tu** has a long-standing collaboration with the Diabetes Transplant Unit at the Prince of Wales Hospital. Dr Tu has served as a consultant to their Molecular Biochemistry projects and co-supervised their PhD students

Professors Chris Mathias and Elspeth McLachlan

National Collaborations

- **Dr Kaarin Anstey** continues her collaboration with Professor Henry Brodaty, Academic Department of Old Age Psychiatry, University of New South Wales, on a longitudinal study of depression now based at Prince of Wales Hospital and the Centre for Mental Health Research at ANU on predictors of cognitive decline.

- **Professor Tony Broe's** close collaboration continued with Dr Helen Creasey, Dr Louise Waite and Dr Bill Brooks at Centre for Education and Research on Ageing at Concord Hospital with Professor Peter Schofield at the Garvan Institute of Medical Research and with Dr Ralph Martins in Perth. Collaboration with Dr Skye McDonald, Department of Psychology, University of New South Wales resulted in a Ramaciotti Foundation grant to establish neuropsychological assessment and MRI volume studies on cases through the Prince of Wales Cognitive Disorders Clinic.

- In 2001, while based in Miami, **Dr Jane Butler** continued her collaborations with **Prof S C Gandevia**, **A/Prof D K McKenzie** and **Dr J L Taylor** from the Prince of Wales Medical Research Institute and Dr R D Herbert from the University of Sydney. Publications in 2001 include work done previously with Dr M R Crawford from the Department of Anaesthesiology and Intensive Care Prince of Wales Hospital, and Dr A R Glanville from the Transplant Unit, St Vincent's Hospital.

- **Associate Professor Glenda Halliday** has extensive collaborations with Dr Jillian Kril at the Centre for Education and Research on Ageing, Concord Hospital and the University of Sydney, holding joint grant project funding on the assessment of dementia syndromes. We coordinate the Regional Brain Donor Program for neurodegenerative disorders that involves patients and clinicians throughout NSW and the ACT. A/Professor Halliday coordinates the database for our Brain Donor Program and also the Brain Donor Program of the Victorian Movement Disorders Research Group run by Dr Andrew Hughes at the Austin Medical Centre, Melbourne. Dr Kril coordinated the formal Australian concensus of neuropathologists on diagnostic methods for dementia syndromes (published in 2002), as well as the monthly meetings of the Frontotemporal Research Group of interested Sydney clinicians and scientists (approximately 15 participants from across Sydney). Associate Professor Halliday collaborates with Professor Peter Schofield at the Garvan Institute for Medical Research in Sydney on genetic forms of dementia, jointly supervising research students and research programs. Other collaborations include: the DEDCeL collaborative group working on early diagnostic methods for identifying patients with parkinsonism – this group involves around 30 clinicians and scientists in Sydney and Newcastle, and is co-ordinated by **Dr Kay Double** at POWMRI; Dr Double is an associate investigator on a research grant held by Drs David Howells and Andrew Hughes at the Austin Medical Centre, Melbourne to look at new dopamineric neurons in human basal ganglia, and collaborates with Professor George Paxinos and his group on developing brain atlases.

- **Dr Antony Harding** has been collaborating with Dr Laurie Miller, a neuropsychologist from the Royal Prince Alfred Hospital examining the Magnetic Resonance Imaging and Computerised Tomography scans of patients with thalamic infarctions. Dr Harding's role in this collaboration is to identify from the images the precise sub-regions of the thalamus affected by the infarction, and Dr Miller has been clinically assessing the patients for functional changes. In such a way, some of the functions of the thalamus can be elucidated. An earlier case study was recently published in the journal 'Neuropsychologia'. Dr Harding has had extensive collaborations with Dr Jillian Kril from the Department of Immunology and Centre for Education and Research on Ageing at Concord Hospital and the University of Sydney. Dr Kril also has significant involvement with the Brain Bank, working from Concord Hospital, from where the majority of cases with dementia originate. The collaborative studies with Dr Kril have concentrated on the hippocampal changes that occur in Alzheimer's disease and vascular dementia. Dr Harding's collaboration with Prof Peter Schofield and Dr John Kwok, from the Garvan Institute of Medical Research has recently commenced, where further clinical and genetic investigations of families identified from the family history of dementia with Lewy bodies is about to commence.

- **Dr Jasmine Henderson** has an ongoing collaboration examining basal ganglia lesions in parkinsonian primates with Dr David Finkelstein and Professor Mal Horne at Monash University, Melbourne.

- In a collaboration with the University of Wollongong **Dr Yuri Koutcherov** and **Professor George Paxinos** are studying the development of the hypothalamic network regulating food intake and metabolism in mice.

- In 2001, in association with clinicians and basic science researchers, **Dr Stephen Lord** was awarded a Partnership in Injury Grant. This grant involves nine

Chief Research Partners, 37 Associate Research Partners, and 17 Funding Partners. The Partnership Grant research collaborators are listed below as are my co-investigators on other grants and co-authors on my publications. Those indicated with an asterisk are research partners on the Partnership in Injury grant.

- Anstey, K, Dr, Prince of Wales Medical Research Institute.*
- Bashford, G, Dr, Port Kembla Hospital.*
- Bauman, A, Prof, School of Community Medicine, UNSW*
- Bliokas, V, Dr, Port Kembla Hospital.*
- Broe, A, Prof, Prince of Wales Hospital.*
- Cameron, I, Assoc Prof, University of Sydney.*
- Carney, L, Prof, Queensland University of Technology.*
- Clark, R, Dr, St Vincents Hospital, Sydney.*
- Colaguiri, S, Dr, Prince of Wales Hospital, Randwick.
- Courtney M, Prof, Queensland University of Technology.*
- Creasey, H, Dr, Concord Hospital, Sydney.*
- Cumming, R, Assoc Prof, University of Sydney.*
- Davis, G. Dr, University of Sydney.
- Edwards, H, Assos Prof, Queensland University of Technology.*
- Eisman, J, Prof, Garvan Institute, Sydney.
- Evand, J, Prof, Queensland University of Technology.*
- Fitzpatrick, RD, Dr, Prince of Wales Medical Research Institute.*
- Grayson, D, Dr, Concord Hospital, Sydney.*
- Halmagyi, GM, Prof, Royal Prince Alfred Hospital, Camperdown.*
- Harris, M, Prof, School of Community Medicine, UNSW.
- Hennessy, M. Prince of Wales Hospital.*
- Hills P, Mr, Queensland University of Technology.*
- Hodges, P, Dr, Prince of Wales Medical Research Institute.*
- Kerr, G, Dr, Queensland University of Technology.*
- Kuys, S, Ms, Princess Alexandra Hospital.*
- Lloyd, D, Dr, Department of Safety Science, UNSW.
- March, L, Prof, Royal North Shore Hospital, University of Sydney.*
- Menz, H, Mr, University of Western Sydney.*
- Mitchell, P, Prof, University of Sydney.*
- Munro, B, Ms, University of Wollongong.*
- McCloskey, DI, Prof, Prince of Wales Medical Research Institute.*
- Newman, B, Prof. Queensland University of Technology.*
- Ni, S, Dr, Royal North Shore Hospital.*
- Ogle, S, Dr, Royal North Shore Hospital, University of Sydney.*
- Oldenburg, B, Prof, Queensland University of Technology.*
- Parker, A, Prof, Queensland University of Technology.*
- Rogers, MW, Assoc Prof, Northwestern University, Chicago, USA.
- Salgado, R, Dr, St George Hospital, Kogarah.*
- Sambrook, P, Prof, Royal North Shore Hospital, University of Sydney.
- Sherrington, C, Dr, Bankstown-Lidcombe Hospital, Sydney.*
- Steele, J, Dr, University of Wollongong.*
- Silburn, P, Prof. Princess Alexandra Hospital.*
- Smeathers J, Dr. Queensland University of Technology.*
- Smith, G, Dr, University of Queensland.*
- Taylor, J, Dr, Prince of Wales Medical Research Institute.*
- Varghese P, Dr, Princess Alexandra Hospital.*
- Ward, J, Dr, Prince of Wales Hospital, Randwick.
- Williams, M, Ms. Southwest Area Health Service, Sydney.*
- Wood, J, Assoc Prof, Queensland University of Technology.*
- Worringham C, Dr. Queensland University of Technology.*
- **Dr Vaughan Macefield** has been collaborating with two investigators from the Faculty of Medicine, University of Newcastle. Dr Robin Callister spent six months at the Institute recording from single muscle vasoconstrictor nerve fibres in human subjects during postural increases and decreases in sympathetic drive. Dr Philip Bolton has been spending one day per week at the Institute looking at the effects of galvanic vestibular stimulation on muscle sympathetic outflow in human subjects, a collaborative study with PhD student **Dan Wardman**. With Dr John Morley and Dr Richard Vickery from the School of Physiology and Pharmacology, UNSW, and **Dr Penelope McNulty** at the Institute, Vaughan has been examining the encoding of textures by single cutaneous afferents.
- **Professor Elspeth McLachlan** and colleagues are working with Professor Carolyn Geczy, School of Medical Sciences, UNSW on the inflammatory processes following nerve injury. Their collaboration with Dr Susan Luff, Monash University, Melbourne on the ultrastructure of blood vessel innervation is continuing. Papers are being prepared in conjunction with Mikel Lopez de Armentia who is now at the John Curtin School of Medical Research in Canberra.
- **Dr Peregrine Osborne** collaborates closely with Professor MacDonald

A/Professor Mark Rogers, DRS Stephen Lord and Richard Fitzpatrick

Christe's group in Pharmacology at the University of Sydney in studying the biological effects of addictive drugs. Recently, Professor Fred Westbrook and Dr Gavan McNally in Psychology at the University of New South Wales have also become involved in this work.

- **Professor Erica Potter** has been working with colleagues at the Garvan Institute of Medical Research, Dr Herbert Herzog and Dr Tina Iisma, who create genetically modified mice. Mice that have the NPY Y2 receptor, NPY Y4 receptor or galanin1 receptor deleted have been supplied to us. We look at parasympathetic autonomic neurotransmission in these genetically modified mice.
- **Dr Marcus Stoodley** continued his collaboration with Professor N R Jones at Surgery Department, University of Adelaide resulting in rat and sheep models of post-traumatic syringomyelia.
- **Dr Marcus Stoodley** and **Dr Andrew Brodbelt** collaborated with A/Professor C Bertram at School of Biomechanical Engineering, UNSW investigating the biomechanics of CSF flow in syringomyelia.
- **Dr Marcus Stoodley** and **Dr Kingsley Storer** collaborated with Professor MK Morgan at Surgery Department, University of Sydney studying molecular biology of human brain blood vessel malformations.

Visiting Scientists 2001

- **Professor Roger Lemon**, Head of the Sobell Department of Neurophysiology, Institute of Neurology, University College, London visited the Burke-Gandevia Laboratories to discuss pathways which transmit corticospinal input to upperlimb motorneurones in different species.
- **Professor Mary Luszcz**, School of Psychology and Centre for Ageing Studies, Flinders University worked with Dr Kaarin Anstey on the Australian Longitudinal Study of Ageing. Professor Luszcz and Dr Anstey published, conjointly, three papers, two looking at the association between vision, hearing and memory in old age and a third on demographic, cognitive, sensory and health predictors of mortality in very old adults.
- **Professor Pricilla MacRae**, Professor of Sports Medicine and Coordinator of Physical Education, Pepperdine University, Malibu, California, USA visited Dr Stephen Lord. Dr MacRae is an authority on conducting exercise intervention trials in older people, particularly those who are frail or with dementia.
- **Professor André De Troyer**, Professor of Medicine and Physiology, Erasme University Hospital, Belgium visited Professor Simon Gandevia's laboratory to conduct respiratory experiments and analyse previously collected data.
- **Dr Caroline Rae**, Biochemistry, University of Sydney visited Dr Jenny Harasty's laboratory to work on their collaboration examining the brains of girls with Turner's Syndrome.
- **Dr Russell Jacobs**, Beckman Institute, Caltech, USA visited the laboratory of Professor George Paxinos and presented a seminar entitled 'Looking Deeper into Vertebrate Development'.
- **Professor Emmanuel Pierrot-Deseilligny**, Hôpital de la Salpêtrière in Paris, France spent two weeks with Professor David Burke and researchers Cindy Lin and Jane Wilton. The first series of studies concentrated on the factors responsible for the control of spinal reflexes and the second involved setting up a peripheral nerve and reflex model of the mechanisms involved in "intracranial inhibition".
- **Dr Maria Nordlund,** Karolinska Institute in Stockholm, Sweden visited Professor Simon Gandevia and his team to work on recording cervicomedullary motor evoked potentials (CMEPS) from FDI.
- **Assoc Professor Mark Rogers**, Physical Therapy Department at Northwestern University Medical School in Chicago, USA visited Assoc Professor Stephen Lord and Dr Richard Fitzpatrick for a six-week study into human movement and balance.
- **Dr Danny Weinreich**, University of Maryland, USA joined Dr James Brock's team to learn the technique of recording from corneal sensory nerve endings.
- **Dr Billy Dunn**, University of Nottingham, UK visited to continue collaboration with Dr Brock's team on the neural control of blood vessels.
- **Assoc Professor Vickie Galea**, School of Rehabilitation Science, McMasters University, Canada worked with Drs Vaughan Macefield and Penelope McNulty on the influence of viscous loading on the firing of human muscle spindles and cutaneous afferents during finger movements.
- **Dr Karen Søgaard**, National Institute of Occupational Health, Copenhagen, Denmark is researching with Dr Janet Taylor and Professor Simon Gandevia the neural mechanisms associated with prolonged low-level contractions. Dr Søgaard has a particular interest in the muscle changes produced by weak contractions performed repetitively, or for long periods in the work place.
- **Professor Manfred Gerlach**, Department of Child and Youth Psychiatry, University of Würzburg, Germany visited Dr Kay Double to discuss their collaborative project on early diagnosis of

neurodegenerative diseases.

- **Professor Shao Shi Wang**, Director and **Assoc Professor You Yu Lu**, Deputy Director, Neurology Department, First People's Hospital, University of Shanghai, China worked with Dr Jasmine Henderson and Assoc Professor Glenda Halliday on a clinical survey of olfactory, sleep and sensory deficits in Parkinson's disease patients. Their work compared the patients with elderly normal controls enrolled in the brain donor program.
- **Claire Ballinger**, Occupational Therapist, University of Southampton, UK visited as part of a study trip to Australia investigating strategies for falls prevention.
- **Dr Philip Bolton**, Faculty of Medicine, University of Newcastle, worked with Dr Vaughan Macefield and Daniel Wardman on the influence of the vestibular system on the human sympathetic nervous system.
- **Dr Robyn Callister**, Faculty of Medicine, University of Newcastle worked with Dr Vaughan Macefield on single-unit recordings from human sympathetic neurons at different levels of sympathetic drive.
- **Professor John Hodges**, MRC Cognition and Brain Sciences Unit, Cambridge, England. Professor Hodges' field of expertise is in the neuropsychology of memory and language, Alzheimer's disease, semantic dementia, progressive aphasia and subcortical dementias. He is a specialist on functional brain imaging (SPECT and PET) studies.
- **Associate Professor Gerald Münch**, Interdisciplinary Centre for Clinical Research (IZKF), University of Zeipzig, Germany where he investigates the protein chemistry of neurodegenerative disorders visited Dr Claire Shepherd and Assoc Professor Glenda Halliday to work in collaboration on a paper that looks at cellular stress in familial Alzheimer's disease patients.
- **Dr David Melzer**, Clinical Senior Research Associate, Department of Public Health and Primary Care, University of Cambridge, visited Dr Kaarin Anstey to secure information for the English Longitudinal Ageing Study which is in the design stage.
- **Assoc Professor Mark Onslow**, Australian Stuttering Research Centre worked with Dr Jenny Harasty on a study of the brains of twins, one of whom studies.
- **Professor Charles Lindsey**, Federal University, San Paolo, Brazil visited Professor George Paxinos.
- **Dr Mikael Elam**, University of Göteborg, Sweden spent three months with Dr Vaughan Macefield setting up new lines of investigations into various problems experienced by spinally injured patients.
- **Dr Tibor Hortobagyi**, East Carolina University, Carolina, USA worked with Professor Simon Gandevia on neuromuscular training effects that occur of the side of the body opposite the one involved in the training.
- **Dr Wei-Ping Gai**, Department of Physiology, Flinders University, South Australia works on a-synuclein and other inclusion bodies of neurodegenerative diseases, particularly Parkinson's disease and dementia with Lewy bodies. He

Professor Manfred Gerlach

Dr Yrsa Bergmann Sverrisdóttir

visited Assoc Professor Glenda Halliday.

- **Professors Luis Puelles** and **Margaret Martinez de-la-Torre**, University of Murcia, Spain visited the Institute to work on the atlas of the chick brain with Professor George Paxinos.
- **Professor Charles Watson**, Curtin University visited to work on the atlas of the chick brain with Professor George Paxinos.
- **Dr John Leah**, Griffith University visited to support an application for funding for the genetic architecture of the human cortex.
- **Dr Hiroe Inokuchi**, Department of Physiology, Kurume University, School of Medicine, Kurume, Kyushu, Japan, visited Professor Elspeth McLachlan's laboratory to take part in experiments on ganglionic synapses and work on joint papers relating to sacral spinal cord in spinalised rats.
- **Dr Giles Plant**, University of Western Australia visited the Institute to present "Transplantation of genetically engineered olfactory ensheathing glia into the injured mammalian spinal cord."
- **Dr Yrsa Bergmann Sverrisdóttir**, Department of Neurophysiology, Sahlgrenska University Hospital in Göteborg and worked on the complex interactions between the sympathetic nervous system and the growth hormone axis and their effect on the cardiovascular system.
- **Dr Brian Day**, Institute of Neurology, University College, London worked with Dr Richard Fitzpatrick and Assoc Professor Stephen Lord in Falls and Movement.

Research Funding

Research Grants and Fellowships for January – December 2002

Summary information on competitive peer reviewed research grants, fellowships and scholarships, and other sources of external research grant income applicable to the calendar year 2002:

National Health and Medical Research Council

- McCloskey DI, Burke D, Gandevia S, Potter E, McKenzie D, Macefield VG, Fitzpatrick R, Taylor J, Experimental neurology, NHMRC Program Grant, 2002 amount $1,054,895
- Brock JA, Peripheral mechanisms involved in autonomic hyperreflexia, NHMRC Project Grant, 2002 amount $88,520.
- Brock JA, Mechanisms controlling the excitability of corneal nociceptor nerve terminals, NHMRC Project Grant, 2002 amount $57,785
- Butler J, Pathophysiological mechanisms in the control of human motoneurones, NHMRC Neil Hamilton Fairley Fellowship, 2002 amount $56,408.
- Cameron ID, Sherrington C, Moseley AM, Lord SR, Enhancing mobility after hip fracture, NHMRC Project Grant, 2002 amount $103,576
- Davis G, Kilbreath S, Fiatarone Singh M, Lord S, Zeman B, Does aerobic or resistance training improve walking ability in chronic stroke patients, NHMRC project grant, 2002 amount $50,000
- Double K, Cellular functions of human neuromelanin, NHMRC Project Grant, 2002 amount $83,000.
- Double K, NHMRC RD Wright Fellowship, 2002 amount $75,190
- Gandevia SC, NHMRC Senior Principal Research Fellowship, 2002 amount $130,000
- Halliday GM, NHMRC Principal Research Fellowship, 2002 amount $115,000
- Halliday GM, What contributes to regional vulnerability in neurodegenerative diseases? A study of familial cases, NHMRC 5 year project grant, 2002 amount $70,258
- Halliday GM, Broe GA, Harding AJ, Brooks WS, Genetic factors and regional brain atrophy in the diagnosis of dementia with Lewy bodies, NHMRC project grant, 2002 amount $192,071
- Hodges P, Lord SR, Physiology and pathophysiology of trunk control mechanisms, NHMRC Project Grant, 2002 amount $30,000
- Keast JR, NHMRC Senior Research Fellowship (B), 2002 amount $105,000
- Keast JR, Changes in pelvic autonomic neurons after spinal nerve injury, NHMRC project grant, 2002 amount $58,509
- Keast JR, Maintenance of neuron structure and function by testosterone, NHMRC project grant, 2002 amount $121,766
- Kiernan MC, Kinetics of persistent sodium channels in rat nerve and their behaviour in human axons, NHMRC The Menzies Foundation, 2002 amount $5,000
- Kril J, Creasey H, Halliday G, Non-Alzheimer dementia: pathogenesis and clinicopathological correlations, NHMRC project grant, 2002 amount $192,071
- Lord SR, Principal Research Fellowship, 2002 amount $115,000
- Lord S, Kerr G, Anstey K, Broe A, Cameron I, Cumming R, Fitzpatrick R, Steele J, Wood J, Prevention of injuries in older people, NHMRC Health Research Partnerships in Injury, 2002 amount $521,047.
- Lord SR, The role of vestibular impairment in instability and falls in older people, NHMRC Project Grant, 2002 amount $110,788
- Macefield VG, NHMRC Senior Research Fellowship (A), 2002 amount $95,000
- Osborne PB, Forebrain neuroadaptations to chronic morphine treatment, NHMRC Project grant, 2002 amount $140,828.
- Osborne PB, Keast JR, Carrive P, Olympus microscope and digital camera, NHMRC Equipment grant, 2002 amount $20,333.50
- Paxinos G, NHMRC Principal Research Fellowship, 2002 amount $115,000
- Potter EK, NHMRC Senior Principal Research Fellowship, 2002 amount $130,000
- Stoodley MA, Jones NR, Investigations of cerebrospinal fluid flow in extracanicular syringomyelia, NHMRC project grant, 2002 amount $93,569
- Taylor JL, NHMRC Research Fellowship, 2002 amount $85,000

Australian Research Council

- Bilston LE and Phan-Thien N; Computational Simulation of Soft Tissue Mechanics, ARC Large Grant, 2002 amount $36,000.
- Keast JR, Trophic factors and plasticity of pelvic ganglion neurons, ARC Large Grant, 2002 amount $62,741

Commonwealth Department of Health and Aged Care

- McLachlan EM, Cellular basis for abnormal sensory and sympathetic behaviour after damage to the nervous system, Department of Health and Aged Care, 2002 amount $109,092.

NSW Department of Health

- Lord SR, Kerr G, Anstey K, Broe A, Cameron I, Cumming R, Fitzpatrick R, Steele J, Wood J, Prevention of injuries in older people, NSW Health Department, 2002 amount $50,000.

Other funding bodies

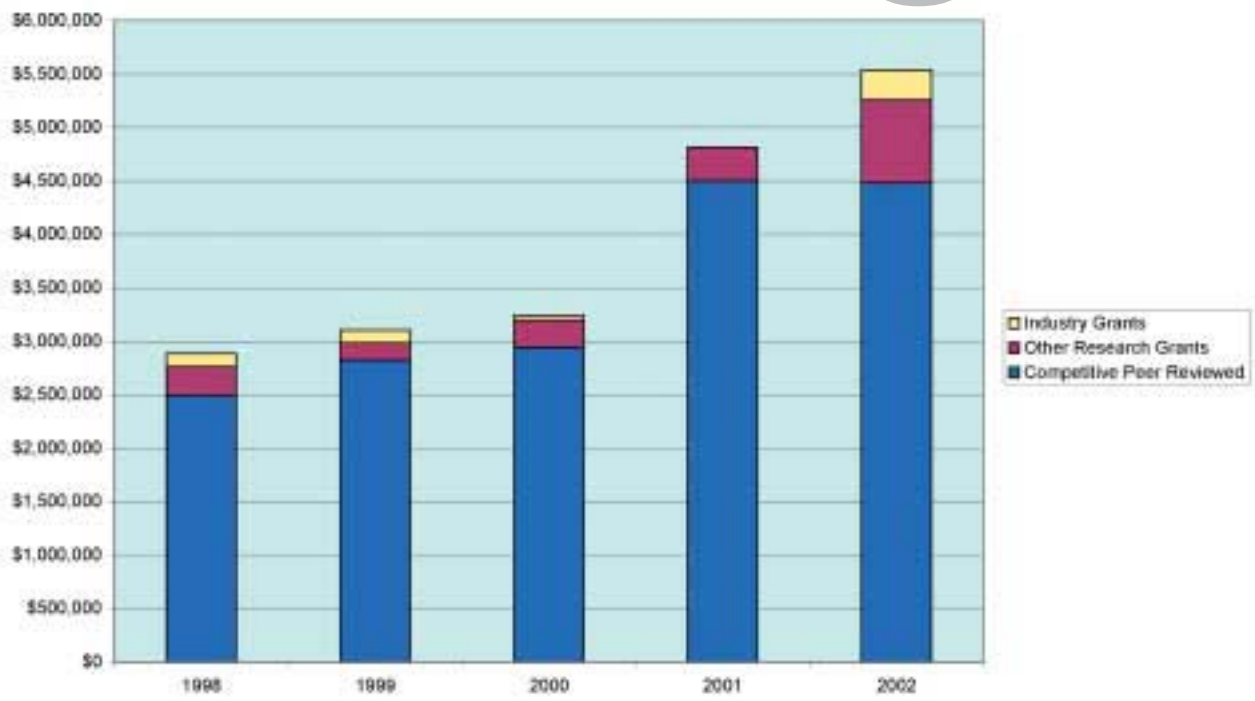
- Broe GA, Anstey K, Bennett H, Harasty J, Harding A, Piguet O, Role of cognitive, behavioural and movement disorders is causing age-related disability with MRI, genetic and neuropathological correlates, Clive and Vera Ramaciotti Foundations, 2002 amount $10,000
- Bilston LE, Brown J, McCaskill M and Henderson M; Identification of injury mechanisms for child occupants aged 3-8 in motor vehicle accidents, Motor Accidents Authority of NSW, 2002 amount $48,433.

- Bilston, LE, High speed video camera system for the study of child injuries in motor vehicles; Ian Potter Foundation, 2002 amount $25,000.
- Bilston, LE, Role of brain elasticity in hydrocephalus, Ronald Geoffrey Arnott Foundation, 2002 amount $18,000.
- Brock J and McLachlan E, Peripheral mechanisms involved in autonomic hyperreflexia Christopher Reeve Paralysis Foundation, (2001/2002 US$ 46,217; 2002/2003 US$ 44,496).
- Brodbelt AR, Fluid flow in post-traumatic Syringomyelia, Madeline Foundation, 2002 amount $24,413
- Double KL, Rowe D, Diagnosing early dopamine cell loss, UNISEARCH, 2002 amount $30,000
- Gandevia SC, Lemon RN; Possible plasticity in the corticospinal activation of primate motoneurones, Wellcome Trust, 2002 amount £9,794
- Halliday GM, Diagnostic tests for Parkinson's disease, dementia with Lewy bodies, and genetic causes of neurodegeneration, Anonymous, 2002 amount $109,286
- Halliday GM, Microglia activation in Parkinson's disease, US National Parkinson Foundation, 2002 amount US$35,940
- Herbert RC, Moseley AM, Sherrington C, Maher C, Physiotherapy Evidence Database (PEDro) Stage 3: Adding evidence-based clinical practice guidelines to the PEDro database of quality-rate clinical trials and systematic reviews in physiotherapy, Motor Accidents Authority of NSW, 2002 amount $46,000
- Herbert RC, Moseley AM, Sherrington C, Maher C, Physiotherapy Evidence Database (PEDro): a database of quality-rated clinical trials and systematic reviews to assist evidence-based physiotherapy practice, Motor Accidents Authority of NSW, 2002 amount $37,000
- Karunanayaka A, Molecular biology of rat brain arteriovenous malformations, Sir Roy McCaughy Surgical Research Fellowship, Royal Australasian College of Surgeons, 2002 amount $32,000
- Kiernan MC, Axonal excitability measures in uraemic patients, UNSW University Research Support Program, 2002 amount $9,000
- Kiernan MC, Nerve dysfunction in renal failure, Brain Foundation, 2002 amount $20,100
- Koutcherov Y, Comparative anatomy of cardiovascular control centres in the human, monkey and rat brain, Sir Colin and Lady MacKenzie Trust Fellowship, 2001/2002 amount $100,000.
- Koutcherov Y, UNSW Global Vice Chancellors Postgraduate Research Fellowship, 2002 amount $162,500.
- Lord SR, Prevention of injuries in older people, NRMA Insurance Limited, 2002 amount $50,000.
- Moseley A, Sherrington C, Maher C, Herbert R, Physiotherapy Evidence Database (PEDro), NSW Physiotherapist's Registration Board, 2002 amount $5,179.
- Osborne PB, Are 5-HT receptors on limbic forebrain pallidal neurons a target for atypical antipsychotic drugs? Clive and Vera Ramaciotti Foundation, 2002 amount $15,000.
- Paxinos G, The Human Cortex: Organization, Development, Homologies to Other Species and 3D Reconstructions, Rebecca L Cooper Medical Research Foundation, 2002 amount $11,046.
- Paxinos G, 3D and MRI atlases of the mouse brain, GlaxoSmithKline, 2002 amount $100,000.
- Paxinos G, The Human Cortex: Organization, Development, Homologies to Other Species and 3D Reconstructions, Clive and Vera Ramaciotti Foundations, 2002 amount $10,000.
- Paxinos G, The Human Cortex: Organization, Development, Homologies to Other Species and 3D Reconstructions, Patrick Brennan Trust, 2002 amount $11,045.
- Stoodley MA, Molecular biology of arteriovenous malformations, Australian Brain Foundation, 2002 amount $20,616
- Storer K, Molecular biology of human brain arteriovenous malformations, Surgical Research Fellowship, Royal Australasian College of Surgeons, 2002 amount $32,000

Scholarships

- Amanat N, Department of Education Science and Training Australian Postgraduate Award, 2002 amount $17,609
- Bennett H, Department of Education Science and Training Australian Postgraduate Award, 2002 amount $17,609 + UNSW Medical Faculty 'top-up" $4,391
- Brooks D, Department of Education Science and Training Australian Postgraduate Award, 2002 Amount $17,609 + UNSW Medical Faculty 'top-up" $4,391
- Gregory G, Department of Education Science and Training Australian Postgraduate Award, 2002 Amount $17,609 + UNSW Medical Faculty 'top-up" $4,391
- Hamlin A, NHMRC Dora Lush (Biomedical) Postgraduate Research Scholarship, 2002 amount $ 17,609
- Orr C, UNSW International Postgraduate Research Scholarship, 2002 amount $18,000 + UNSW Medical Faculty "top-up" $8,000 + Royal North Shore Staff Specialist Scholarship $11,000
- Potts H, Department of Education Science and Training Australian Postgraduate Award, 2002 Amount $17,609 + UNSW Medical Faculty 'top-up" $4,391 + Postgraduate Scholarship from Boehringer Ingelheim 2000 Euros (AUD$3,370)
- Yuen M, Department of Education Science and Training Australian Postgraduate Award, 2002 amount $17,609

research funding 1998-2002



Prizes and Awards

Kaarin Anstey was awarded the Academy of Social Sciences in Australia Medal, 2001

Andy Brodbelt was awarded TOW Prize in Junior Research Division on presentation entitled "Cerebrospinal Fluid Flow in an Animal Model of Post-Traumatic Syringomyelia", 2001, Coast Health Services, Sydney.

Jane Butler, Nicolas Petersen, Janet Taylor and Simon Gandevia were jointly awarded the Paxinos-Watson Prize for the most significant refereed paper published in the neurosciences in 1999 by an Ordinary Member of the Australian Neuroscience Society (2001). This prize recognized the publication of a paper which described the change in efficacy of the apparent connection between the human motor cortex and motoneurones in the spinal cord following exercise.

Jane Butler was awarded the **AK McIntyre Prize** for significant contribution to Physiology in pre- and early post-doctoral years. Presented by The Australian Physiological and Pharmacological Society of Australia.

Kay Double and Marcus Stoodley were awarded New South Wales Young Tall Poppy Award from the Australian Institute of Political Science (award for professional excellence). As a Young Tall Poppy Awardee, Kay Double took an active part in the "Tall Poppies in Flight" program and travelled to primary and secondary schools in rural NSW to promote science as a career.

Drs Jane Butler and Olivier Piguet

Drs Kay Double and Marcus Stoodley

Penelope McNulty was awarded the Student Poster Prize, Australian Neuroscience Society Annual Meeting, Brisbane, 2001

Olivier Piguet was awarded the H Tasman Lovell Memorial Medallion for best PhD in Psychology in 2001, University of Sydney.

publications

Books

1. Lord SR, Sherrington C, Menz HB. Falls in older people: Risk factors and strategies for prevention. Cambridge: Cambridge University Press, 2001.
2. Paxinos G, Franklin KB. The mouse brain in stereotaxic coordinates: Deluxe edition of the atlas. 2nd Ed. San Diego: Academic Press, 2001.

Chapters in Books

3. Gandevia SC. Proprioception. In: Blakemore C, Jennett S, Editors. The Oxford Companion to The Body. New York: Oxford University Press, 2001.
4. Sachdev PS, Loo CK, Mitchell PB, Gandevia SC, Taylor JL, McBride R, Malhi GS, Wen W, Croker V, El-Sayed H. Repetitive transcranial magnetic stimulation (rTMS) for psychiatric disorders: The Sydney studies. In: Miyoshi K, Shapiro CM, Gavira M, Morita Y, Editors. Contemporary Neuropsychiatry. Tokyo: Springer, 2001.
5. Sarks SH, Sarks JP. Age-related maculopathy: Nonneovascular age-related macular degeneraton and the evolution of geographic atrophy. In: Ryan SJ, Schachat AP, Editors. Retina. St Louis: Mosby, 2001
6. Stoodley MA, Steinberg GK. Omental transplantation. In Ikezaki K, Loftus CM, Editors. Moyamoya Disease, Rolling Meadows: AANS, 2001.

Refereed Journal articles

7. Anstey KJ, Luszcz MA, Giles LC, Andrews GR. Demographic health, cognitive and sensory variables as predictors of mortality in very old adults. Psychology and Aging 2001;16(1):3-11.
8. Anstey KJ, Luszcz MA, Sanchez L. A re-evaluation of the common factor theory of shared variance among age, sensory and cognitive function in older adults. Journals of Gerontology: Psychological Science 2001;56B:3-11.
9. Anstey KJ, Luszcz MA, Sanchez L. Two year decline in vision but not hearing is associated with memory decline in very old adults in a population based sample. Gerontology 2001;47:289-293.
10. Arnold J, Sarks S, Age-related macular degeneration. Clinical Evidence 2001;5:425-435
11. Arnold J, Sarks S, Age-related macular degeneration. Clinical Evidence 2001;6:476-483
12. Berg D, Gerlach M, Youdim MB, Double KL, Zecca L, Riederer P, Becker GJ. Brain iron pathways and their relevance to Parkinson's disease. Journal of Neurochemistry 2001;79:225-236.
13. Bor W, Najman JM, O'Callaghan M, Williams GM, Anstey KJ. Aggression and the development of delinquent behaviour in children. Trends and Issues in crime and criminal justice 2001;207:1-6.
14. Brock JA, Pianova S, Belmonte C. Differences between nerve terminal impulses of polymodal nociceptors and cold sensory receptors of the guinea-pig cornea. Journal of Physiology 2001;533.2:493-501.
15. Brodaty H, Luscombe GM, Peisah C, Anstey KJ , Andrews G. A 25 year longitudinal, comparison study of the outcome of depression. Psychological Medicine 2001;31:1347-1359.
16. Broe M, Shepherd C, Milward, EA, Halliday GM. Relationship between DNA fragmentation, morphological changes and neuronal loss in Alzheimer's disease and dementia with Lewy bodies. Acta Neuropathologica 2001;101:616-624.
17. Burke D, Kiernan MC, Bostock H. Excitability of human axons. Clinical Neurophysiology 2001;112:1575-1585.
18. Burke D. Clinical relevance of the putatitve C-3-4 propriospinal system in humans. Muscle and Nerve 2001;24:1437-1439.
19. Butler JE, Anand A, Crawford M, Glanville AR, McKenzie DK, Paintal AS, Taylor JL , Gandevia SC. Changes in respiratory sensations induced by lobeline after human bilateral lung transplantation. Journal of Physiology 2001;534.2:583-593.
20. Butler JE, McKenzie DK , Gandevia SC. Discharge frequencies in single motor units in human diaphragm and parasternal muscles in lying and standing. Journal of Applied Physiology 2001;90:147-154.
21. Caine D, Patterson K, Hodges JR, Heard RN, Halliday GM. Severe anterograde amnesia with extensive hippocampal

degeneration in a case of rapidly progressive frontotemporal dementia. Neurocase 2001;7:57-64.

22. Cappelen-Smith C, Kuwabara S, Lin C, Mogyoros I, Burke D. Membrane properties in chronic inflammatory demyelinating polyneuropathy. Brain 2001;124:2439-2447.
23. Collins DJ, Burke D, Gandevia SC. Large involuntary forces consistent with plateau-like behavior of human motoneurons. The Journal of Neuroscience 2001;21 (11):4059-4065.
24. Cordato N, Halliday GM, McCann H, Fulham MJ, Davies L, Williamson P, Morris JG. Corticobasal syndrome with Tau pathology. Movement Disorders 2001;16(4):656-667.
25. Cowan SM, Bennell KL, Hodges PW, Crossley KM, McConnell J. Delayed onset of electromyographic activity of vastus medialis obliquus relative to vastus lateralis in subjects with patellofemoral pain syndrome. Archives of Physical Medicine and Rehabilitation 2001;82:183-189.
26. Cowan SM, Hodges PW, Bennell KL. Anticipatory activity of vastus lateralis and vastus medialis obliquus occurs simultaneously in voluntary heel and toe raisers. Physical Therapy in Sport 2001;2:71-79.
27. Creasey H, Waite LM, Grayson DA, Bennett HP, Dent O, Broe, GA. The impact of neurodegenerative disorders on ageing: An overview of the Sydney Older Persons Study. Australasian Journal on Ageing 2001;20:10-16.
28. Diamond T, Sambrook P, Williamson M, Flicker L, Nowson C, Fiatarone-Singh M, Lord SR, Ferris L, O'Neil S, MacLennan A. Men and osteoporosis. The Australian Family Physician 2001;30:781-785.
29. Diamond T, Sambrook P, Williamson M, Flicker L, Nowson C, Fiatarone-Singh M, Lord SR, Ferris L, O'Neil S, MacLennan, A. Guidelines for treatment of osteoporosis in men. The Australian Family Physician 2001;30(8):787-791.
30. Elam MB, Macefield VG. Multiple firing of single muscle vasoconstrictor neurons during cardiac dysrhythmias in human heart failure. Journal of Applied Physiology 2001;91:717-724.
31. Gandevia SC. Spinal and supraspinal factors in human muscle fatigue. Physiological Reviews 2001;81:1725-1789.
32. Halliday GM, Kril, J. Effect of anti-inflammatory medications on neuropathological findings in Alzheimer disease. Archives of Neurology 2001;58:517-518.
33. Halliday GM, Shepherd C. Cortical inflammation in dementia with Lewy bodies. Archives of Neurology 2001;58:519-520.
34. Halliday GM. A review of the neuropathology of schizophrenia. Clinical and Experimental Pharmacology and Physiology 2001;28:64-65.
35. Hamlin A, Buller KM, Day TA, Osborne PB (2001) Fos induction in brain neurons by peripheral withdrawal in morphine-dependent rats. Neuropharmacology. 41, 574-581.
36. Harasty JA, Halliday GM, Xuereb J, Croot K, Bennett HP , Hodges, JR. Cortical degeneration associated with phonologic and semantic language impairments in AD. Neurology 56:944-950.
37. Harding AJ , Halliday GM. Cortical Lewy body pathology in the diagnosis of dementia. Acta Neuropathologica 2001;102:355-363.
38. Hardy T, Brock JA. Effects of modulating Ca2+ entry and activating prejunctional receptors on facilitation of excitatory junction potentials in the guinea-pig vas deferens in vitro. Naunyn-Schmeideberg's Archives of Pharmacology 2001;363:515-525.
39. Henderson JM, Gai WP, Hely MA, Reid WG, Walker GL, Halliday GM. Parkinson's disease with late Pick's dementia. Movement Disorders 2001;16:311-319.
40. Henderson JM, O'Sullivan DJ, Pell MF, Fung VS, Hely MA, Morris JG, Halliday GM. Lesion of thalamic centromedian-parafascicular complex after chronic deep brain stimulation. Neurology 2001;56:1576-1579.
41. Herbert RD, Maher CG, Moseley AM, Sherrington C. Effective physiotherapy, British Medical Journal 2001;323:788-790
42. Herbert R, Moseley A, Sherrington C, Maher C. Evidence-based practice - imperfect but necessary. Physiotherapy Theory and Practice 2001;17:201-211.
43. Hodges PW, Cresswell AG , Thorstensson A. Perturbed upper limb movements cause short-latency postural responses in trunk muscles. Experimental Brain Research 2001;138:243-250.
44. Hodges PW, Cresswell AG, Daggfeldt K, Thorstensson A. In vivo measurement of the effect of intra-abdominal pressure on the human spine. Journal of Biomechanics 2001;34:347-353.
45. Hodges PW, Heijnen I, Gandevia SC. Postural activity of the diaphragm is reduced in humans when respiratory demand increases. Journal of Physiology 2001;537.3:999-1008.
46. Hodges PW. Changes in motor planning of feedforward postural responses of the trunk muscles in low back pain. Experimental Brain Research 2001;141:261-266.
47. Hu P, McLachlan EM. Long-term changes in the distribution of galanin in dorsal root ganglia after sciatic or spinal nerve transection in rats. Neuroscience 2001;103(4):1059-1071.
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Patents

Patent Portfolio Summary

Title: Detection of neurodegenerative disorders | Australian Patent application No: PCT/AU01/01271,

Inventor: Double KL (Prince of Wales Medical Research Institute), Rowe DB, Gerlach M andRiederer P

Title: Neuropeptide Y agonists | Provisional No: PO0290

International Application No: PCT/AU97/00352 | International Application Filing Date: 5 June 1997

Inventor: Potter, EK (Prince of Wales Medical Research Institute)

Ref	Application No.	Country	Status
94119	599263/01	Australia	Application pending
91400	2257424	Canada	Application pending
91399	97923672.6	Europe	Under examination
91402	10-500017	Japan	Application pending
90665	P19702520	Malaysia	Under examination
91537	97197106.4	People's Republic of China	Under examination
92932	19/641567	United States of America	Under examination

Title: Neuropeptide Y Y2 agonist peptides | Filing Date: 28 October 1994

Inventor: Potter, EK (Prince of Wales Medical Research Institute)

Ref	Application No.	Country	Status
64838	2134428	Canada	Under examination
64839	5,696,093	United States of America	Granted

conference presentations 2001

During 2001 the Prince of Wales Medical Research Institute hosted an official satellite of the 34th International Congress of Physiological Sciences (2–5 September, 2001) "Spinal Cord Injury: Mechanisms of Spinal Autonomic Reflexes and their Plasticity". Organisers of the Symposium were: Professor Elspeth McLachlan, Prince of Wales Medical Research Institute, Australia; Professor Wilfrid Jänig, University of Kiel, Germany; and Dr Janet Keast, Prince of Wales Medical Research Institute, Australia.

Support for the Symposium was provided by:
International Brain Research Organisation (IBRO) | The Menzies Foundation | Prince of Wales Medical Research Institute | Australasian Spinal Research Trust (ASRT) | International Spinal Research Trust (ISRT) | Motor Accidents Authority of New South Wales (MAA) | Paraplegic Benefit Fund – Australia | Royal North Shore Hospital Spinal Research Trust | Roche Bioscience (Neurobiology Unit, Palo Alto CA) | to whom the organisers and participants extend their thanks.

INTERNATIONAL

AUTHORS	TITLE	NAME OF CONFERENCE	PLACE & DATE OF CONFERENCE
Anstey, K	Factors predicting cognitive decline in old age: Evidence for health, lifestyle and sensorimotor variables	Invited colloquium	University of California May 3, 2001
Anstey, K	Sensorimotor, health, and lifestyle factors associated with cognitive performance in old age: Results from cross-sectional and longitudinal studies	Colloquium	Pennsylvania State University, June 14, 2001
Belmont C, Brock JA, Carr RW, Pianova S	Effects of 4-aminopyridine on sensory transduction in guinea-pig corneal cold receptors	34th Congress of the International Union of Physiological Sciences (IUPS)	Christchurch, NZ., September 2001
Brock JA, Carr RW	Characteristics of nerve impulses recorded directly from the terminals of sensory receptors in the guinea-pig cornea in vitro	IUPS Satellite Symposium, Pain	Sydney, August 2001
Brock JA, Carr RW, Pianova S	Effects of polarizing currents on nerve terminal impulses recorded from sensory nerve endings in the guinea pig cornea	34th Congress of the International Union of Physiological Sciences (IUPS)	Christchurch, NZ., September 2001
Carr RW, Brock JA	Sensory transduction in cold sensitive receptors	Movement and Sensation, International Symposium, (Satellite Symposium of the 2001 IUPS Congress)	Cairns, Qld, Australia, September 3-6, 2001
Brock JA, Dunn WR	Modulation of sympathetic nerve-mediated excitatory junction potentials in rat mesenteric arteries by neurally released CGRP	7th World Congress on Microcirculation	Sydney, August 2001
Brodbelt AR, Stoodley MA, Brown CJ, Jones NR	Time and dose profile of Experimental excitotoxic post-traumatic syringomyelia	Royal Australasian College of Surgeons Annual Scientific Congress	Canberra, 6-11 May 2001
Brodbelt AR, Stoodley MA, Brown C, Jones NR	Experimental excitotoxic post-traumatic syringomyelia	World Federation of Neurosurgical Societies 12th World Congress of Neurosurgery	Sydney, 16-20 September 2001
Brodbelt AR, Stoodley MA, Brown C, Jones NR	Experimental excitotoxic post-traumatic syringomyelia: temporal and dose profile	Congress of Neurological Surgeons Annual Meeting	San Diego, 19 September – 4 October 2001

Broe, GA	MRI Correlates of Normal Brain Ageing: The Sydney Older Persons Study	International Association of Gerontology 17th Congress	Vancouver, Canada June 2001
Burke, D (The Mervyn Eadie Lecture (Inaugural)	The properties and function of myelinated axons	Australian Association of Neurologists	Adelaide, S.A., May 15-18, 2001
Burke, D (Guest Lecture)	Excitability and impulse conduction in peripheral nerve axons	British Society for Clinical Neurophysiology	London, U.K., June 15, 2001
Burke, D (Invited Presentation)	New concepts of axonal excitability	17th World Congress of Neurology	London, U.K., June 17-22, 2001
Burke, D (Invited lecture)	Excitability of peripheral and corticospinal axons in human subject"		CNRS Unit, Université René Descartes (University of Paris V), July 19, 2001
Burke, D (Invited presentation)	Effects of activity on axonal excitability: implications for motor control studies	Movement and Sensation, International Symposium, (Satellite Symposium of the 2001 IUPS Congress)	Cairns, Qld, Australia, September 3-6, 2001
Burke, D (Invited Presentation)	Pitfalls in the preoperative neurophysiological assessment of peripheral nerve lesions	12th World Congress of Neurosurgery	Sydney, September 16-20, 2001
Butler JE, Ribot-Ciscar E, Ijdewind I, Thomas CK	Attempts to reduce fatigue in paralysed human thenar muscles by increasing muscle perfusion pressure.	Satellite meeting of the Congress of the 34th International Union of Physiological Sciences	Cairns Australia, September 3-6 2001
Butler JE, Taylor JL, Gandevia SC	Responses to stimulation of corticospinal axons are reduced during sustained maximal voluntary contractions in humans	Satellite meeting of the Congress of the 34th International Union of Physiological Sciences	Cairns Australia, September 3-6 2001
Butler JE, Thomas CK	Motoneurone excitability (f-wave) changes during fatigue of control and paralysed thenar muscles	Congress of the 34th International Union of Physiological Sciences	Christchurch, NZ. 2001
Gandevia,SC	Balancing acts: respiratory sensations, motor commands and human posture	FASEB Meeting: American Physiological Society	March 31-April 4, 2001
Gandevia,SC (International guest lecture)	Muscle fatigue, motor commands and beyond	Japan Microneurography Society	Japan, June 23, 2001
Gandevia,SC	Rapid effects of peripheral afferents on cortical excitability and perception	IUPS Satellite Symposium, Organization and Processing in the Cerebral Cortex for Sensation and Perception	Sydney, August 22-24, 2001
Gandevia,SC	Invited discussant for the Symposium: "Control of respiratory muscles"	34th Congress of the International Union of Physiological Sciences	Christchurch, New Zealand, August 26-31, 2001
Gandevia,SC	Perceptual interactions and proprioceptive inputs	IUPS Satellite Symposium, Movement and Sensation	Cairns, Australia, September 3-6, 2001
Gerlach M, Double KL, Ben-Shachar D., Youdim, MBH., Zecca, L. Riederer, P	Neuronmelanin is neurotoxic via its interaction with redox-active	2nd Deutscher Parkinson-Kongress	Bochum, 7-10 March, 2001
Gerlach M, Double KL, Zecca, L Riederer P	The relevance of Lewy bodies and neuromelanin as a cause of neuronal death underlying Parkinson's disease	2nd Deutscher Parkinson-Kongress	Bochum, 7-10 March, 2001
Häbler H-J, Stebbing M, Lopez de Armentia M,	Excitability changes in rat sensory neurons after spinal nerve lesions.	Deutsche Physiologisches Gesellschaft	Hamburg, Germany March 2001

Eschenfelder S; McLachlan EM.			
Halliday GM, Spira P, Sharpe D, Nicholson G	A parkinsonian syndrome in a family with an ALA53THR alpha-synuclein mutation	Annual Meeting of the American Association of Neuropathologists	Chicago, USA, 21-24 June 2001
Hardman CD, Henderson J, Finkelstein, DI, Horne MK, Halliday GM	A comparison of the basal ganglia in rats, monkeys and humans	VIIth International Triennial Meeting, International Basal Ganglia Society	Bay of Islands, New Zealand, 11-15 February 2001
Hardman CD, Henderson J, Halliday GM	Neurodegeneration in basal ganglia disorders: a comparison between Parkinson's disease and progressive supranuclear palsy	VIIth International Triennial Meeting, International Basal Ganglia Society	Bay of Islands, New Zealand, 11-15 February 2001
Henderson JM	Which basal ganglia surgical targets ameliorate Parkinsonian symptoms?	International Basal Ganglia Society V11th International Triennial Meeting	Bay of Islands, New Zealand February 2001.
Hu P, McLachlan EM	Loss of cutaneous but not muscle neurones in the dorsal root ganglion after sciatic nerve transection in the rat.	34th Congress of the International Union of Physiological Sciences (IUPS)	Christchurch, NZ, August 27-28 2001
Hu P, McLachlan EM	Lymphocyte and macrophage invasion proximal to sciatic nerve transection in rats	Soc. Neurosci. Annual Meeting	San Diego, November, 2001
Inokuchi H, Lu Y, McLachlan EM, Higashi H	Characteristics of neurons in the intermediate region of sacral spinal cord in normal and spinalized rats	IUPS Satellite Symposium	Sydney, September 2-5, 2001
Keast JR, Ouyang M	Electrophysiological properties of pelvic ganglion cells in intact, adult, castrated adult and prepubertal male rats	34th Congress of the International Union of Physiological Sciences (IUPS)	Christchurch, NZ, August 2001.
Kiernan MC (Invited speaker)	Pathophysiology of paraesthesiae	XV International Congress of Clinical Neurophysiology & the 24th Epilepsy World Congress	Buenos Aires, Argentina 17 May 2001
Kiernan MC (Invited speaker)	Excitability studies in clinical practice London, England	Sport and Exercise Research Centre, South Bank University	15 March 2001
Kiernan MC (Invited speaker)	Impulse conduction and nerve injury	Royal College of Surgeons of England	Lincoln's Inn Fields, London, England 5 March 2001
Kiernan MC	Measures of axonal excitability ion patients with acquired neuromyotonia	World Congress of Neurology	London, England 20 June 2001
Kiernan MC	Axonal hyperpolarization in multifocal motor neuropathy with conduction	Annual Scientific Meeting of the British Society of Clinical Neurophysiology	London, England 15 June 2001
Lord SR	Sensorimotor and balance factors associated with ageing and falls in older people.	International Association of Gerontology 17th Word Congress. Symposium on "The Interaction of Sensorimotor and Cognitive Functioning in Aging",	Vancouver, July, 2001
Lord SR	Visual Risk Factors for Falls	XVth International Symposium on Posture and Gait	Maastricht, The Netherlands, July, 2001
Macdonald RL, Ono S, Marton LS, Ahmed I, Stoodley M, Komuro T, Zhang ZD, Yamini B, Weir B	Studies on the Molecular Weight of the Interaction Required for Development of Experimental Vasospasm	AANS/CNS Joint Section on Cerebrovascular Surgery Annual Scientific Meeting	Hawaii, 2001

McLachlan EM	Some properties of sympathetic preganglionic neurones and descending synaptic connections	IUPS Satellite Symposium	Sydney, September 2-5, 2001
McLachlan EM, Davies PJ, Brock JA	Trans-synaptic modifications in peripheral sympathetic pathways after SCI	IUPS Satellite Symposium	Sydney, September 2-5, 2001
McLachlan EM., Hu P, Keast JR.	Peripheral nerve injury affects cutaneous but not muscle sensory neurones in rats.	Society for Neuroscience Annual Meeting	San Diego, November, 2001
McNulty PA	Neural volleys to the human hand evoked by transcranial magnetic stimulation are increased during ischaemic block to the forearm	Satellite meeting of the Congress of the 34th International Union of Physiological Sciences	Cairns Australia, September 3-6 2001
McNulty PA	Neural volleys to the human hand evoked by TMS are not decreased during ischaemic block to the forearm	IUPS Satellite Symposium	Sydney, September 2-5, 2001
Mobbs RJ, Smee R, Kwok B, Stoodley MA	LINAC radiosurgery for cerebral arteriovenous malformations: A 10 year experience	AANS/CNS Joint Section on Cerebrovascular Surgery Annual Scientific Meeting	Hawaii, 2001
Mobbs RJ, Stoodley MA, Fuller JW	Effect of hard collar on intracranial pressure after head injury	World Federation of Neurosurgical Societies 12th World Congress of Neurosurgery	Sydney, 16-20 September 2001
Piguet O, Grayson DA, Ridley L, Bennett HP, Brooks WS, Creasey H, Lye TC, Broe GA	Significance of MRI white matter changes to cognitive ageing: Evidence from the Sydney Older Persons Study	17th World Congress of the International Association of Gerontology	Vancouver, Canada. July 2001
Sarks SH, Sarks JP, Arnold JA, Greaves AM	Clinicopatholic Observations Relating to Pathogenesis of Vitelliform Macular Lesions	2001 Macula Society Meeting (XXIV Annual)	Scottsdale Arizona 28th February — 3rd March 2001
Smith-White, MA, Herzog H, Potter EK	Cardiac vagal activity in neuropeptide Y Y2 receptor-knockout mice	Proceedings of the 6th International NPY Conference	Sydney April 22-26, 2001
Stoodley MA	Design and Use of a Multimedia Outcomes Database	Accuray Cyberknife Users' Group Meeting	Carmel, California, April 2001
Stoodley MA	Neurosurgeons and Histopathologists: Interactions and Expectations	Neuropathology Specialty Club Meeting, Australasian Division of the International Academy of Pathology, Annual Scientific Meeting	Sydney, June 2001
Stoodley MA	The role of perivascular flow in the pathogenesis of syringomyelia	World Federation of Neurosurgical Societies 12th World Congress of Neurosurgery	Sydney, 16-20 September 2001
Stoodley MA	How I do it: Anterior communicating artery aneurysms	World Federation of Neurosurgical Societies 12th World Congress of Neurosurgery	Sydney, 16-20 September 2001
Stoodley MA, Stoodley MJ, Weir BK	Multimedia and outcomes monitoring system for neurosurgery	4th Congress of the International Society for Neurosurgical Technology and Instrument Invention	Cairns, 2001
Stoodley MA, Storer KJ,	Internet teleradiology system for neurosurgical emergencies	4th Congress of the International Society for Neurosurgical Technology and	Cairns, 2001

Stoodley MJ, Lancashire W		Instrument Invention	
Stuart M, Butler JE, Collins DF, Taylor JL, Gandevia SC	The history of contraction of the wrist flexors can alter cortical excitability.	Satellite meeting of the Congress of the 34th International Union of Physiological Sciences	Cairns Australia, September 3-6 2001
Taylor JL, Butler JE, Petersen N, Gandevia SC	Corticomotoneuronal behaviour during and after exercise	Satellite meeting of the Congress of the 34th International Union of Physiological Sciences	Cairns Australia, September 3-6 2001
Taylor JL, Butler, JE, Petersen N, Gandevia SC	Transcortical reflex response evoked during near maximal efforts in the elbow flexors of human subjects	Congress of the 34th International Union of Physiological Sciences	Christchurch, NZ. 2001

National

AUTHORS	TITLE	NAME OF CONFERENCE	PLACE & DATE OF CONFERENCE
Anstey KJ	Factors protective against cognitive decline over 8 years in the Australian Longitudinal Study of Ageing	Australasian Society for Psychiatric Research	Melbourne, December 8, 2001
Anstey KJ	Symposium overview: Health, cognition and affect in older adults	Australian Association of Gerontology	Canberra, September 8, 2001
Bengtson CP, Osborne PB	Electrophysiological effects of 5-HT and dopamine on GABA and ACh neurons in the globus pallidus and ventral pallidum	21st Annual Meeting of the Australian Neuroscience Society	Brisbane January 2001
Bennett HP, Corbett AJ, Gaden S, Grayson DA, Kril JJ, Broe GA	Small Vessel Disease: Predictors of incident dementia in a 6-year longitudinal study	College of Clinical Neuropsychologists National Conference	Melbourne, October 2001
Broe GA	Geriatric Medicine in the 21st Century	Australian Society for Geriatric Medicine National Conference	Sydney May, 2001
Broe GA (Keynote Address)	A Century of Ageing	Australian Association of Gerontology 2001 National Conference. Ageing and Progress, Past, Present and Future	Canberra September, 2001
Broe M, Harding A, Halliday G	Relationship between cell loss in the midbrain and hippocampus and alpha-synuclein deposition in neuropathological lesions	21st Annual Meeting of The Australian Neuroscience Society	Brisbane Convention Centre, 28-31 January 2001
Carr, R.W., Pianova, S., Brock J.A	Effects of polarizing currents on impulses recorded extracellularly from guinea-pig corneal sensory nerve endings	Australian Neuroscience Society	Brisbane, January 2001
Cappelen-Smith C	Conduction block in chronic inflammatory demyelinating polyneuropathy	Australian Association of Neurologists Annual Scientific Meeting	Adelaide, Australia, May 2001
Double KL, Rowe DB, Halliday GM	The DEDCeL Research Group (2001) Diagnosing preclinical Parkinson's disease: the Sydney DEDCeL Study	6th Multi Disciplinary Conference on Parkinson's Disease	Parkinson's Australia, Melbourne, 19-21 August 2001

Double, K.L., Rowe, D.B., Griffiths, F., Chan, D., Riederer, P., Gerlach, M	A specific immune response in Parkinson's disease.indicates central dopaminergic cell death	Australian Neuroscience Society	Brisbane Jan 2001
Drobney J, Anstey, KJ	Neuropsychological Testing in Older Adults with Age-Related Sensory Decline: A Measure of Cognitive or Sensory Functioning?	Australian Association of Gerontology	Canberra, September 8, 2001
Halliday GM, Macdonald VM	Loss of a population of pyramidal neurons in the supplementary motor area of Parkinson's disease	Annual Scientific Meeting, Australian Association of Neurologists	Adelaide, 14-18 May 2001
Harding A	Specialised laboratory design for diverse functions	Inaugural Meeting on Laboratory Design and Technology	Sydney, 2001
Harding AJ, Halliday GM	Identifying families with dominantly inherited Parkinson's dementia	6th Multi Disciplinary Conference on Parkinson's Disease	Parkinson's Australia, Melbourne, 19-21 August 2001
Henderson J, Stimson E, Harding AJ, Halliday GM	Early loss of amygdaloid cortical nucleus may underlie selective anosmia of Parkinson's disease	Annual Scientific Meeting, Australian Association of Neurologists	Adelaide, 14-18 May 2001
Henderson JM, Stimson E, Harding AJ, Halliday GM	Early loss of the amygdaloid cortical nucleus may underlie selective anosmia of Parkinson's disease	Annual Scientific Meeting, Australian Association of Neurologists	Adelaide 14-18 May 2001
Henderson JM, Watson S	The role of the substantia nigra pars reticulata in postural symmetry in parkinsonian animals	Australian Society for Medical Research Meeting	Gold Coast November 2001
Hu P, McLachlan EM	Macrophages and lymphocytes proximal to sciatic and spinal nerve lesions in the rat	Australian Neuroscience Society	Brisbane January 2001
Jeffery S, McKenzie DK, Butler JE, Gandevia SC, Wang L	Reflex inhibition of inspiratory muscles in response to airway occlusion is prolonged in obstructive sleep apnoea		2001
Koutcherov Y, Mai JK, Ashwell KWS, Paxinos G	Organization of the human hypothalamus in fetal development	21st Annual Meeting of the Australian Neuroscience Society	Brisbane January 2001
Koutcherov Y, Mai JK, Cheng G, Paxinos G	Calcium-binding proteins mark areas of insula cortex in the human fetus	21st Annual Meeting of the Australian Neuroscience Society	Brisbane January 2001
Lord SR (keynote speaker)	A physiological profile approach for preventing falls in older people	Australian Geriatrics Society Annual Conference	Leura, May, 2001
Lord SR (keynote speaker)	Which interventions work: the role of exercise in falls prevention	Australian Geriatrics Society Annual Conference	Leura, May, 2001
Lord SR	Falls assessment; from the simple to the comprehensive	National Falls Forum	Sydney, May, 2001.
Lord SR	Vestibular, sensorimotor and balance tests in the prediction of falls in older people	National Otology Society of Australia Annual Conference	Sydney, August, 2001

Lord SR	Falls assessment; what do we need and how do we collect it?	National Falls Forum	Sydney, May, 2001
Lord SR	Falls prevention strategies and programs	The Australian Fracture Prevention Summit	Melbourne, September, 2001
Lord SR	The role of exercise in preventing injuries in older people	Second National Sports Injury Prevention Conference	Sydney, November, 2001
McCann H, Cordato NJ, Davies L, Williamson P, Morris JGL, Halliday GM	Corticobasal syndrome with tau pathology	21st Annual Meeting of The Australian Neuroscience Society	Brisbane Convention Centre, 28-31 January 2001
McLachlan EM	Synaptic transmission in sympathetic ganglia and its modification after injury to the nervous system	Australian Neuroscience Society	Brisbane, Qld 2001
McNulty PA (invited presentation)	Motor cortical output to human hand muscles during ischaemia block of the forearm	Postgraduate and Professional Development Expo	UNSW, Sydney 2001
McNulty PA	Does blocking sensory input from the hand affect motor cortical output?	Australian Neuroscience Society	Brisbane, Qld 2001
Nickolls P, Gorman R, Collins D, Burke D, Gandevia SC	Distributed muscle stimulation of human tibialis anterior	IMSOP Conference	Melbourne, p28, Nov 2001
Petersen N, Taylor JL, Butler JE, Gandevia SC	Reduced corticospinal transmission to motoneurones after strong voluntary contraction persists during a weak contraction	Australian Neuroscience Society Meeting	Melbourne 2001
Piguet O, Grayson DA, Broe GA, Tate RL, Lye TC, Bennett HP, Creasey H, Brooks WS	Executive Functions: Are We Really Measuring What We Think We Are Measuring?	24th Annual Australian Society for the Study of Brain Impairment Conference	May 2001
Piguet O, Grayson DA, Ridley L, Bennett HP, Lye TC, Brooks WS, Creasey H, Broe GA	Executive functions in very old individuals and MRI white matter lesions: do they matter? Evidence From The Sydney Older Persons Study	7th Annual Conference of the Australian Psychological Society College of Clinical Neuropsychologists	Melbourne, October 2001
Shepherd CE, Kril JJ, Halliday GM	Specificity of inflammatory pathology for Alzheimer's disease	21st Annual Meeting of The Australian Neuroscience Society	Brisbane Convention Centre, 28-31 January 2001
Shirley H, Sarks J (Invitation)	Age-related Macular Disease Pathology Update Symposium: on "Age-related Macular Disease"	Royal Australian and New Zealand College of Ophthalmologists 33rd Annual Scientific Congress	28 October – 1 November 2001
Stoodley MA	What the Neurosurgeon Needs from Intraoperative Monitoring	Australian Association of Neurologists Clinical Neurophysiology Workshop	Gold Coast, March 2001
Taylor JL, Butler JE, Gandevia SC	Transmastoid stimulation evokes an unexpected long-latency response in the elbow flexors of human subjects	Australian Neuroscience Society Meeting	Melbourne 2001

service
to the Scientific Community

Professional service to the scientific community and related organisations:

Ian McCloskey

- Member, Prince Henry/Prince of Wales Hospitals Research Committee, 1998–

David Burke

- Clinical Program Director, Institute of Neurological Sciences, The Prince Henry and Prince of Wales Hospitals, 1998–
- Director, Brain Foundation (NSW)
- Co-Chairman, Division of Medicine, The Prince Henry and Prince of Wales Hospitals, 1998–
- Member, Scientific Advisory Panel, Australasian Spinal Research Trust, 1995–
- Member, Scientific Advisory Committee, Madeline Foundation for Neurosurgical Research, 1999–
- Member-at-Large, Executive Committee, International Federation of Clinical Neurophysiology (Region 2 representing North and South America, Japan and Australasia), 1997–2001
- Member, Executive Committee, Motor Neurone Disease Research Institute Inc, 1995–
- Medical Advisor, Motor Neurone Disease Association of NSW, 1993–
- Chairman, Medical Advisory Panel, Motor Neurone Disease Association of NSW, 1999–
- Member, Commission on Somatosensory Function & Pain, International Union of Physiologists
- Council Member, Australian Association of Neurologists, 2000–

Simon Gandevia

- Chair, Commission on Exercise & Work Physiology for the International Union of Physiological Sciences
- Member of Advisory Committee, Biennial Conference on Muscle and Nerve Function in Health and Disease, University of Sydney
- Member, Commission on Respiratory Physiology for the International Union of Physiological Sciences

Elspeth McLachlan

- Member, Nuffield Foundation Medical Fellowship Committee, 1999–
- Chair, IBRO Asian Pacific Regional Committee, 1999–2001
- Member of Council, Australian Academy of Science, 1998–2002
- Member, National Committee for Physiology, Australian Academy of Science, 1998–2002
- Member, Scientific Advisory Board, John Curtin School of Medical Research, 1996–2001

Erica Potter

- Member, NHMRC Program Committee, 2001

Glenda Halliday

- Member, Scientific Advisory Board, Victorian Movement Disorders Collaborative Research Group, 1998–2002
- Member, 2000–2002 Local Organising Committee for the 2002 Annual Meeting of the Australian Neuroscience Society
- Member, Research Committee, Faculty of Medicine, University of New South Wales, 1999–2002
- Member, 2000-2002 Management Council, Parkinson's NSW Inc
- Executive Director, Brain Bank, POWMRI and Parkinson's NSW Inc, 1993–2002
- Council Member, International Basal Ganglia Society, 2001–2004
- Member, 2001 International Basal ganglia Society programme committee
- Member, 2001 Grant Assessment Committee, Hunter Medical Research Institute
- Member, IBRO Adhoc Committee on Memberships and Partnerships, 2001–2002

scientific

- Member, Finance Committee, Faculty of Medicine, UNSW, 2001–2002
- Member, Scientific Board Member, International Consortium on Dementia with Lewy bodies, 2000–2002

Marcus Stoodley

- Member, Quality Committee, Institute of Neurological Sciences, Prince of Wales Hospital, 1999–
- Academic representative, SESAHS Area Director of Neurosurgery's Advisory Committee, 2000–
- Member, Brain Foundation NSW Committee, 2001–

James Brock

- Treasurer, Australia and New Zealand Microcirculation Society
- Member of Organising Committee, 7th World Congress of Microcirculation

Janet Keast

- Member of Executive Committee, International Society for Autonomic Neuroscience, 1999–
- Member of NHMRC Project Grant Review Panels/Discipline Panels 1999–2001
- Chair of GRP (Peripheral and Cellular Neuroscience) in 2001
- Member, Editorial Board, Autonomic Neuroscience: Basic and Clinical 2001–
- Core Reviewer, BMC Physiology 2001–
- NSW/ACT representative, National Association of Research Fellows 2001–

Stephen Lord

- Member, Strategic Discussion Group, NSW Physical Activity Task Force to promote physical activity in NSW, 1997–2002
- Member, Osteoporosis Australia Medical and Scientific Committee
- Member and Scientific Advisor, New South Wales Falls Prevention Network

Vaughan Macefield

- NSW State Representative for the Australian Neuroscience Society and on the organising committee for the Australian Neuroscience Society Annual Meeting to be held in Sydney, Australia in 2002.

Antony Harding

- Member, National Board, Transplant Australia
- Vice-President, Liver Support Group Inc

Jasmine Henderson

- Regular invited speaker to community groups on behalf of Parkinson's Australia

Shirley Sarks

- Director, Gerontology Foundation of Australia

Editorships

Ian McCloskey

- Clinical and Experimental Pharmacology and Physiology
- Experimental Physiology

David Burke

- Muscle and Nerve (Associate Editor)
- Clinical Neurophysiology (Executive Board Member)
- Journal of Clinical Neuroscience
- Contemporary Neurology

Simon Gandevia

- Journal of Physiology
- Acta Physiologica Scandinavica
- Journal of Applied Physiology
- Clinical and Experimental Pharmacology and Physiology
- Australian Journal of Physiotherapy

Elspeth McLachlan

- Clinical and Experimental Pharmacology and Physiology
- Clinical Autonomic Research

Erica Potter

- Asia Pacific Journal of Pharmacology

George Paxinos

- NeuroImage
- Neuroscience and Biobehavioural Reviews
- Journal of Chemical Neuroanatomy

Glenda Halliday

- Neuroscience Letters

Paul Hodges

- Physiotherapy Research International (Associate Editor)

education 2001

Seminars and Workshops

In addition to the following Institute Seminars, regular Seminars were also held throughout the year for Graduate Students

9 March	Dr Dave Collins	POWMRI	Large involuntary forces consistent with plateau-like behaviour of human motoneurons.
23 March	Dr Mikael Elam	University of Göteberg, Sweden	Neural control of lipolysis?
	Dr Peregrine Osborne	POWMRI	Morphine withdrawal selectively activates forebrain pathways in opioid-dependent rats.
20 April	Dr Alan Brichta	University of Newcastle	The peripheral vestibular system: hair cells, afferents and jerks!
27 April	Dr Silvan Lacroix	University of Geneva	Enzymatic modulation of neurogenic inflammation in the airways mucosa.
11 May	Dr Phil Robinson	CMRI, Sydney	Regulating endocytosis in neurons: What's phosphorylation got to do with it?
25 May	Dr Marcus Stoodley	POWMRI/POWH	Pathophysiology of syringomyelia.
8 June	Prof George Paxinos	POWMRI	Chemoarchitecture: a Rosetta Stone for the establishment of human homologues to nuclei identified in other animals.
22 June	Dr Pankaj Sah	John Curtin School of Medical Research, ANU, Canberra	GABA receptors in the amygdala: types and targeting
27 July	Dr Greg Stuart	John Curtin School of Medical Research, ANU, Canberra	Some insights into how neurons think.
10 August	Dr Robin Callister	University of Newcastle	Cardiovascular adaptation to occupational exposure to high g-forces.
14 September	A/Prof Brian Key	University of Queensland	How does an axon find its way in the developing and regenerating nervous system?
28 September	Dr Kevin Keay	University of Sydney	Central integration of events associated with traumatic injury.
12 October	Dr Helen Cooper	Walter and Eliza Hall Institute, Melbourne	Molecular strategies for axon guidance.
26 October	Dr Cathie Sherrington	POWMRI	The effects of exercise on physical ability after fall-related hip fracture.
	Dr Claire Shepherd	POWMRI	Tau proteins in fronto-temporal dementia.
23 November	Dr Jasmine Henderson	POWMRI	The role of the substantia nigra pars reticulata in postural symmetry.
Special (i.e. additional) Seminars			
5 July	Dr Russell Jacobs	Beckmann Institute Caltech, USA	Looking deeper into vertebrate development.
3 August	Prof James Skinner	Indiana University, USA	The Heritage Research Project: The effect of genotype in the responses to exercise.
21 August	Prof Roger Lemon	University College London, UK	Pathways transmitting corticospinal inputs to upper limb motoneurons in different species.
26 October	Dr Lynne Bilston	University of Sydney	Biomechanics of the central nervous system.
23 November	Dr Tim Scott	Royal North Shore Hospital	Rehabilitation Research: Studies into improving function in the paralysed upper limb of those with high spinal cord injury.
3 December	Prof Danny Weinreich	University of Maryland, USA	Changes in chemoreception and excitability in vagal afferents. provoked by allergen-induced inflammation – regulation of tachykinin receptors in primary sensory neurons.

postgraduate students 2001

Student	Degree	Project Title	Supervisors
Postgraduate degrees conferred in 2001			
Dr Dominic Rowe	PhD	Molecular changes in Parkinson's disease	G Halliday
Todd Hardy	PhD	Analysis of factors controlling transmitter release from sympathetic nerves	J Brock
Virginia Macdonald	PhD	The neocortex in Huntington's disease: comparison with other neurodegenerative diseases	G Halliday
Penelope McNulty	PhD	Sensorimotor integration in control of the human hand	V Macefield
Melissa Broe	PhD	Regional vulnerability in Alzheimer and Lewy body disease: Cell death mechanisms and protein abnormalities	G Halliday
Dr Nicholas Cordato	PhD	Brain atrophy in Parkinsonian disorders	J Morris (Medicine USyd)/G Halliday
Students beginning/continuing studies for postgraduate degrees in 2001			
Dr Solomon Ni	MD	The role of sensory input in human motor control (deferred for 12 months)	S Gandevia
Dr Andy Brodbelt	PhD	Pathology and treatment of post-traumatic syringomyelia	MA Stoodley
Dr Cecilia Cappelen-Smith	PhD	Activity-dependent conduction block in demyelinating polyneuropathies	D Burke
Dr Athula Karunanayaka	PhD	Molecular biology of rat cerebral arteriovenous malformations	MA Stoodley
Dr K Storer	PhD	Molecular biology of human cerebral vascular malformations	MA Stoodley MK Morgan (Surgery/USyd)
Robert Gorman	PhD	Neural control and mechanics of human respiratory muscles during increased ventilatory drive	S Gandevia
Gillian Gregory	PhD	Early onset dementia: molecular and cellular variations	G Halliday
Rohan Humphrey	PhD	Pancreatic exocrine cells transdifferentiate to form multipotent cells	S Smith (Anatomy UNSW) / C Yeo
Cindy Kersaitis	PhD	Neuropathology of frontotemporal dementia	J Kril (Medicine USyd)/G Halliday
Cindy Lin	PhD	Differences in biophysical properties of cutaneous afferents innervating upper and lower limbs	D Burke
Hylton Menz	PhD	Determinants of walking in normal and patient groups	S Lord
Lorimer Moseley	PhD	The influence of psychological factors associated with pain on neural control of spinal stability	P Hodges
Margaret Smith-White	PhD	Role of neuropeptides in autonomic regulation of the cardiovascular system	E Potter
Daniel Wardman	PhD	Neural control of posture and locomotion	R Fitzpatrick
Anne Tiedemann	MPH	Development of a validated falls risk assessment for use in general practice	S Lord

Fundraising

"We are heavily dependent upon generous support from individuals and companies who believe in what we are achieving in the research arena. Through their vital work, our scientists will continue to make a difference to the lives of so many."

Events

'An Evening in Rajasthan'

Guests were transported to India for a night in a Maharana's palace through an exotic cultural and culinary experience at 'An Evening in Rajasthan'. Board member John Everett invited long-time friend Arvind Singh Mewar, the Maharana of Udaipur, to attend a fundraising dinner at Doltone House which was themed around his visit and which raised $350,000 for the Institute's Spinal Injuries Research Centre. Prior to the dinner, the Maharana and Princess Devaki Singh toured the Institute and saw, at first hand, the dedication and enthusiasm of the staff and the research being undertaken in the Centre.

The event was supported by very generous sponsors and guests; the Institute's Patron, Dr Colleen McCullough; radio celebrity and Master of Ceremonies for the evening, Alan Jones; Auctioneer for the night, Ray Hadley and Sydney 2000 Paralympic Games Silver Medalist, Liesl Tesch.

'Dinner with Tony Mowbray'

In November, the Institute held a fundraising dinner at Pruniers Restaurant in Woollahra with guest speaker Tony Mowbray, the spirited adventurer who set a new Australian record for his solo, non-stop and unassisted world circumnavigation in his yacht "Solo Globe Challenger". Tony took 120 guests to the edge and back with an incredible tale of adventure - his courage and infectious humour were inspirational. The dinner was supported by Alfa Romeo, Tiffany & Co, Taylors Wines and many generous sponsors who provided gifts in kind for a charity auction and raffles.

Individual and Corporate Giving

Financial support for the Institute had continued to grow from regular and new donors. We are indebted to the many corporations, organisations and individuals who have provided this invaluable financial support over the past year. We also gratefully acknowledge the significant pro bono support provided from many corporations. And thank you to the numerous companies and individuals who generously donated their services and products to ensure the success of all our events. Your support and assistance are invaluable.

Supporting our Research

The Prince of Wales Medical Research Institute is Australia's largest independent site for research on the functions and disorders of the brain and the nervous system. We obtain funding through government sources and successful grant applications. However, there are major costs that cannot be financed from these sources yet which are vital expenditure if we are to remain at the leading edge of research internationally.

This is where we are heavily dependent upon generous support from individuals and companies who believe in what we are achieving in the research arena. Through their vital work, our scientists will continue to make a difference to the lives of so many. You can also make a significant difference by supporting the Institute financially and joining with us in an invaluable partnership.

Use of donated funds

All donations are used to support the Institute's research programs and also to assist with the purchase of equipment and laboratory supplies. Donations are not used for administrative purposes or to support our fundraising activities.

Special Purpose

We will be happy to respect a request that your donation be applied to a particular area of research or piece of equipment, or to establish a scholarship for outstanding young scientists to further their research within the Institute.

Donations

All donations over $2 to the Prince of Wales Medical Research Institute are tax deductible.

Bequests

A bequest to the Prince of Wales Medical Research Institute is a lasting way to ensure that vital research programs will improve the lives of many individuals living with devastating neurological disorders. A detailed booklet on how to make a bequest to the Institute is available by phoning our Fundraising Department on (02) 9382 2738.

Mailing address for donations
P O Box 82
ST PAULS NSW 2031
All cheques should be made payable to the Prince of Wales Medical Research Institute.

your generous support

The Prince of Wales Medical Research Institute thanks all our supporters in 2001.

Our Supporters

The Prince of Wales Medical Research Institute thanks all our supporters in 2001.

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McIntosh, Wyn
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Pennefather, Graham R
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Yates, Laurel
Yuncken, Ross & Jan

Event Sponsors & Gifts in Kind

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Alliance Francaise
ANA Harbour Grand Hotel
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David Jones
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Sportscar World Rentals
Sunglass Hut International
Tony Mowbray
Taylors Wines
The Truffle Group
Tiffany & Co
Trimex
Us for Hair + Body
Vogue
Yaffa Publishing
Yves Saint Laurent

Our People

Institute Staff 2001 and 2002

Executive Director
Prof Ian McCloskey AO BSc(Med) MBBS DPhil DSc FAA FTSE FRACP

Director, Clinical Research and Head, Neurology, Prince Henry/Prince of Wales Hospitals
Prof David Burke AO MD DSc FAA FTSE FRACP

Chief Operating Officer
Dr George Mammen BSc PhD MBA

NHMRC Senior Principal Research Fellows
Prof Simon Gandevia
BSc(Med) PhD MD DSc FAA FRACP
Prof Erica Potter BSc PhD DSc

Head, Centre for Research Management, NHMRC
Prof Elspeth McLachlan DSc FAA [to June 2001]

Pro Vice-Chancellor (Research), UNSW
Prof Elspeth McLachlan DSc FAA [from July 2001]

NHMRC Principal Research Fellows
Assoc Prof Glenda Halliday BSc(Hons) PhD
Assoc Prof Stephen Lord BSc MA PhD
Scientia Professor George Paxinos
BA MA PhD DSc

NHMRC Senior Research Fellows
Dr James Brock BSc(Hons) DPhil
Dr Janet Keast BSc(Hons) PhD
Dr Vaughan Macefield BSc(Hons) PhD

NHMRC Research Fellows
Dr Janet Taylor MBiomedE MD
Dr Paul Hodges BPhty(Hons) PhD [to June 2001]

Head, Respiratory Medicine, PHH/POWH
Assoc Prof David McKenzie
MBBS BSc(Med) PhD FRACP

Neurosurgeon, PHH/POWH
Dr Marcus Stoodley MBBS(Hons) PhD FRACS

Senior Scientists
Dr Lynne Bilston
BE(Mech)(Hons) MSE(BioEng) PhD

Senior Research Officers
Dr William Brooks,
Dr Richard Fitzpatrick BSc(Hons) MBBS PhD
Dr Antony Harding BSc(Hons) PhD
Dr Yuri Koutcherov BSc(Hons) PhD
Dr Peter Nickolls MBBS BSc BE(Elec) PhD
Dr Peregrine Osborne BSc(Hons) PhD
Dr Jasmine Henderson
BSc GradDipNutDiet PhD [to April 2002]

NHMRC R Douglas Wright Research Fellows
Dr Kay Double BSc(Hons) PhD

Postdoctoral Research Fellows
Dr Jane Butler BSc(Hons) PhD
Dr Jenny Harasty MAppSc(SpPath) PhD
Dr Matthew Kiernan MBBS(Hons) PhD FRACP
Dr Kaarin Anstey BA(Hons) PhD
[to July 2001]

Honorary Visiting Fellows
Dr Yrsa Bergmann-Sverisdottir
MSc PhD(Med) [from Sweden]
Dr Dave Collins MSc PhD
[returned to Canada 2001]
Dr Nicolas Petersen MSc PhD
[returned to Denmark 2002]

(Senior) Research Associates
Prof Tony Broe AM BA MBBS FRACP FACRM
Prof David Hirst Zoology, University of Melbourne
Prof Gunnar Wallin University of G^teborg, Sweden
Assoc Prof James Colebatch Neurology, POWH
Assoc Prof John Morris
Neurology, Westmead Hospital
Assoc Prof Kathy Refshauge
Health Sciences, University of Sydney
Assoc Prof Alessandro Zagami
Neurology, POWH
Dr Jane Chan MBBS(Hons), Neurology, POWH
Dr Nicholas Cordato CERA, Concord Hospital
Dr Helen Creasey CERA, Concord Hospital
Dr William Dunn University of Nottingham, UK
Dr Mikael Elam University of G^teborg, Sweden
Dr Sharon Kilbreath Health Sciences,
University of Sydney
Dr Murray Killingsworth, SWAPS
Dr Jillian Kril CERA, Concord Hospital
Dr John Morley
Physiology & Pharmacology, UNSW
Dr Dominic Rowe
Neurology, Royal North Shore Hospital
Dr John Sarks
AM, POWMRI Electron Microscope Unit

our staff

our people

The RRA Scheme is intended to facilitate R&D activity with other organisations, an increasingly important focus of the Institute's research directions.

Dr Shirley Sarks
AM, POWMRI Electron Microscope Unit
Dr Bi (Michael) Sheng Neurosurgery, POWH

Research Officers

Dr Anil Amaratunga BSc MSc PhD [to July 2002]
Dr Hayley Bennett BA(Hons) MA MSc PhD
Dr Melissa Broe BSc(Hons) PhD
Dr Craig Hardman BSc(Hons) PhD
Dr Virginia MacDonald BSc(Hons) PhD
Dr Penelope McNulty BHMS(Hons) PhD
Mr Hylton Menz BAppSc(Pod)Hons [from March 2002]
Dr Olivier Piguet BPsych MA(ClinNeuropsych) PhD
Dr Tertia Purves BSc(Hons) MSc PhD
Dr Claire Shepherd BSc(Hons) PhD
Dr Catherine Sherrington BAppSc(Phty) MPH PhD
Mr Craig Thomas BSc [from March 2002]
Dr Richard Carr BScApp DPhil [to Dec 2001]

Senior Hospital Scientists

Dr James Tu MBBS(China) MSc PhD
Mr Christopher Brown BAppSc [to June 2001]

Research Assistants

Mr Daniel Brooks BSc(Hons) [to June 2002]
Ms Heidi Cartwright BSc
Mr Michael Cartwright BSc
Ms Peggy Chan BSc(Hons)
Ms Kirsten Chapman BA BSc
Ms Anurina Das MEpidemiol
Ms Francine Griffiths BSc(Med)
Mr Robert Gorman BE
Mr Adam Hamlin BSc(Hons) [to Dec 2001]
Mr Ping Hu BMed MM
Ms Emma Kettle BAppSc GradDip(Epidemiol)
Ms Marcella Kwan BSC GradDip(Biotech) GCHSM
Ms Cindy Lin MEngSc BE
Ms Heather McCann DipHlthSci
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Ms Juliette Drobny MPsychol(Clin) [to Mar 2002]
Mr Refik Kanjhan MSc [to Nov 2001]
Mr Phillip Meyerkort BSc(Hons) [to Mar 2001]
Ms Bridget Munro BSc(Hons) [to Oct 2001]
Ms Lara Perryman BSc(Hons) [to Apr 2002]
Mr Gavin Pinniger BSc(Hons) [to Mar 2002]
Mr Christopher Scarlett BSc(Hons) [to Nov 2001]
Mr Daniel Wardman BMedSc(Hons) [to Feb 2002]

Honours students

Ms Haley Bennett BSc(Hons)
Ms Emma Schofield BSc(Hons)

Finance

Mr Andrew Dermott
BEc CA, Company Secretary
Mr Albert Chua BSc Mcom [deceased Feb 2002]

Information Technology and Operations

Mr John Hales BSc MBiomedE

Scientific Support

Ms Roslyn Nickolls BA DipEd
Ms Mary Sweet

Administration

Ms Deborah McKay BHlthAdmin
Ms Annie Butler BA (Tourism Mgmt)
Mrs Lynda Coady
Ms Ursula Daniels
Ms Rosalie Dworjanyn BSc GradDipInfoMgmt
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Ms Rhonda du Bois [to Jan 2001]
Ms Katherine Krilov BSc GradDipAsianSt [to Jun 2001]
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Public Relations and Marketing

Ms Anne Graham RN
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Ms Tamara Powell DipAppSc(BCT) [to Feb 2002]

Finance 1998-2002

Financial Summary

Balance Sheet	1998 $000	1999 $000	2000 $000	2001 $000	2002 $000
Current Assets	4,363	4,948	2,571	3,641	5,535
Property, Plant & Equipment	2,027	2,657	6,280	6,294	6,375
Total Assets	**6,390**	**7,605**	**8,851**	**9,935**	**11,910**
Current Liabilities	22	77	143	177	1,601
Provisions	0	20	0	1	5
Total Liabilities	**22**	**97**	**143**	**178**	**1,606**
Retained Surplus	2,718	3,858	5,058	6,107	6,654
Reserves	3,650	3,650	3,650	3,650	3,650
Total Net Funds	**6,368**	**7,508**	**8,708**	**9,757**	**10,304**

Financial information was extracted from the unaudited Financial Statements of the Prince of Wales Medical Research Institute for the year ending 30 June 2002 and is included here for information purposes only. A full copy of the audited Financial Statements, including Notes to the Financial Statements and the Audit Opinions, can be obtained free of charge on request to the Finance Manager, Prince of Wales Medical Research institute, Barker Street, Randwick NSW 2031.

financial summary

Prince of Wales Medical Research Institute

annual report

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The Prince of Wales Medical Research Institute is Australia's major independent site for research on the functions and disorders of the brain and the nervous system.

annual report

annual report 2001/2002

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