SCHIZOPHRENIA
RESEARCH
INSTITUTE

living with schizophrenia

ANNUAL REPORT 2009

Contents

One in 100 young Australians will develop schizophrenia. Thirty per cent will attempt suicide. Schizophrenia affects not only the people diagnosed with the condition, but their families, friends and the community at large.

The Schizophrenia Research Institute is the only medical research institute solely focused on discovering what causes schizophrenia, and how to prevent or cure it.

It is time to make 'living with schizophrenia' a better life.

2009 Highlights

First Clinical Drug Trial

Professor of Schizophrenia Epidemiology and Population Health

500 schizophrenia recruits join Research Bank

Schizophrenia Library

Chairman's report

Day by day: with your help we can make a world of difference

Schizophrenia research is on the cusp of important discoveries, the threshold of potentially great change. A generation ago cancer was only ever a whispered word. But years of investment in research, better detection and incremental advances in treatment have improved outcomes and led to a new generation which understands the need to fund research in the prevention and treatment of cancer. Although one in four Australians develop cancer, or know someone with cancer, they also know real hope.

The Schizophrenia Research Institute believes that this kind of hope is also within the grasp of Australians living with schizophrenia. With a continued flow of donations, corporate sponsorships and grants, the Institute will be able to fund the national research program needed to deliver improved outcomes to the one in 100 young Australians who will develop this illness.

For people with schizophrenia, their family and friends we are striving to make living with this illness a better life. Ultimately we aim to move beyond improved treatments, to prevention.

Over the last 13 years, with the support of NSW Health, our generous donors and a wide range of research grants, we have invested more than $26 million in programs tailored to identify the causes of schizophrenia, ways to prevent it, and edge closer to a cure.

In the last year the Institute has supported its first clinical drug trial. Under the direction of Dr Tom Weickert and Professor Cyndi Shannon Weickert, the Macquarie Group Foundation Chair of Schizophrenia Research, the trial is aimed at improving the cognitive function and other dimensions of disability in people with schizophrenia.

From our early years when we invested just $200,000 a year in the program, the generosity of our donors means that in 2009 we spent $5million on schizophrenia research programs. We now have two professorial chairs devoted purely to schizophrenia research and we run Australia's largest genetics research project for this illness with the Australian Schizophrenia Research Bank.

The appointment of Vaughan Carr, as Professor of Schizophrenia Epidemiology and Population Health at the University of New South Wales will further enhance our ability to understand, treat and prevent schizophrenia.

We must remain ambitious in our mission – and we ask for your continued support, both financially and as advocates, to make a difference to those living with schizophrenia.

Peter Maher
Chairman

CEO's report

Getting to grips with schizophrenia

Schizophrenia is a complex disorder, with genetic and environmental determinants. There is as yet no cure, and current treatments must be improved so that more people with the illness can go on to live full and rewarding lives.

Schizophrenia does not discriminate; it can arise in any family. The cost of schizophrenia to the Australian economy is over $2 billion a year. The cost to families and friends is immeasurable.

The Schizophrenia Research Institute believes that medical research is the best way to discover the clues for solving this disorder. It is only with scientific research that we can understand the genetic underpinnings of the condition, how we can better treat schizophrenia or even prevent it.

These are lofty ambitions, but they are underpinned by belief in the value of the scientific method. Since scientists began unpicking the human genome extraordinary discoveries have been made and the study of schizophrenia will be the beneficiary of these findings.

At the same time we need to understand what happens in the development of human beings, from embryonic and foetal life through childhood and adolescence, to identify the risk and protective factors for schizophrenia so that we may establish the basis for future preventative interventions.

This year has seen significant areas of progress for the Institute. The first clinical drug trial undertaken by the Schizophrenia Research Laboratory could bring immediate benefits to people living with schizophrenia.

If your parent has schizophrenia you are 13 times more likely to develop the illness.

The genetic research undertaken by Dr Murray Cairns is leading edge internationally. Unearthing a clearer understanding of the role of microRNA in regulating gene expression is high on the global scientific research agenda and we are fortunate to have his considerable expertise working with us in our mission.

This year we have also seen a record number of successful government grants obtained by our network of scientists with over $3million going to schizophrenia research from the National Health and Medical Research Council.

Our future is forward thinking and positive. The research program includes a longitudinal study of children. An initial pilot study, already underway, involves linking existing population-based, de-identified data to locate potential early markers for health and wellbeing later in life. The second phase of the study will involve following a large cohort of children over a 15-20 year period, to identify risk and protective factors for adverse health and social outcomes during adolescence and early adulthood.

Another major initiative planned for next year is the opening of researcher access to the Australian Schizophrenia Research Bank in July 2010. The Bank is the largest national genetics research project in schizophrenia, aiming to collect clinical information, blood samples and brain scans on a large number of people living with schizophrenia and healthy controls, which will be compiled and cross-referenced into a unique national database. As well as creating a database for scientists to access in perpetuity, research volunteers from the Bank can also opt to help us with other research studies we are conducting.

I would like to express my sincere personal thanks to all those who have volunteered to participate in the Institute's research. Without their selfless generosity our work would not be possible.

In March 2010 the Institute will launch the Schizophrenia Library, an online source of information on many of the important issues relating to schizophrenia.

This resource will be available to the community, clinicians, scientists and policy makers. Around 200 schizophrenia related topics will be covered in the library which will provide a rich source of information to everyone interested in the condition.

We believe initiatives such as this are of critical importance in developing a greater awareness of the illness among health professionals, policy makers and the community at large. This should then translate into improved understanding and outcomes for people with schizophrenia.

Finally, it is also a great pleasure to announce that the Schizophrenia Research Institute will be hosting the Australasian Schizophrenia Conference 2010, in September at the Sheraton on the Park Hotel in Sydney.

This conference, attended by outstanding international and national guest speakers, will provide a great opportunity for us all to come together, in a spirit of optimism and open-minded curiosity, as we continue the search for better understanding of schizophrenia and how to help people with this illness live productive and fulfilled lives.

Professor Vaughan Carr
Chief Executive Officer

The Board of Directors

Peter James Maher
Chairman
Non-Executive Director

Peter Maher became a board member in 2003 and has been chairman since 2006. He is Group Head of Macquarie Group Ltd's Banking and Financial Services Group. He is also the current Chairman of Macquarie Equities Limited, Chairman of Macquarie Financial Services Holdings Ltd, a board member of Macquarie Investment Management Ltd, Religare Macquarie Wealth Management Ltd, Brook Asset Management Ltd, and OzForex Pty Ltd. He is also Deputy Chairman of the Investment & Financial Services Association.

Vaughan Carr
Chief Executive Officer
Executive Director

A board member since 2004, Vaughan Carr is the CEO of the Schizophrenia Research Institute, Conjoint Professor of Psychiatry University of Newcastle; former Founding Director, Centre for Brain and Mental Health Research, University of Newcastle; Past President, Australasian Society for Psychiatric Research. He was recently appointed Professor of Schizophrenia Epidemiology and Population Health in the School of Psychiatry, University of New South Wales.

Stanley Victor Catts
Non-Executive Director

Stanley Catts was the founding Chair of the Schizophrenia Research Institute (formerly NISAD) 1995-1999. A board member since 1995, he acted as chairman from 1995 until 1999. He is also Professor of Community Psychiatry, University of Queensland, and Royal Brisbane and Women's Hospital and is a Fellow of the Royal Australian and New Zealand College of Psychiatrists. Stanley is the Chair of the Scientific Steering Committee, Australian Psychosis Research Network.

Resigned: 28 August 2008

Matthew Cullen
Deputy Chairman
Non-Executive Director

Matthew Cullen joined the board in 2004. He is Co-President of McKesson Asia-Pacific Pty Ltd and Visiting Medical Officer St Vincent's Hospital Sydney. He is a Fellow of the Royal Australian and New Zealand College of Psychiatrists, a Member of the Australian Institute of Company Directors, and Associate Fellow of the Australian College of Health Service Executives.

Dr Cullen was previously a Member of the NSW Mental Health Review Tribunal and a Board Member of the Schizophrenia Fellowship of NSW.

Sam Lipski
Non-Executive Director

Sam Lipski is the Chief Executive of The Pratt Foundation, and from 2000 to 2006 he served as President of the State Library of Victoria. He has founded, published, written for and edited a diverse range of publications around the world.

Amongst his community involvements he has been a Member of Council at the Swinburne University of Technology and a Trustee of the Australian Refugee Foundation. He has been an Institute board member since 2007, is a participant in the Annual Australian American Leadership Dialogue and is on the Board of the National Institute for Circus Arts. Mr Lipski became a Member of the Order of Australia in 1993 for his services to the media. In 2003 he was awarded the Centenary Medal of Australia for services to journalism.

Chris McDiven
Non-Executive Director

Currently a Company Director and Chairperson of the International Women's Democrat Union Chris McDiven joined the board in 2009. She is a member of the organising committee for the International Conference of Asian Political Parties 2009, and President of the NSW Kambala School Council; formerly Federal President of the Liberal Party of Australia (2005–2008), and Liberal Party State President NSW (2000–2005). She was previously President of the Federal Women's Committee (1994–1997), and board member of the Australian Sports Foundation, the Keep Australia Beautiful Council, the National Foundation of Australian Women, and the Powerhouse Museum Fund-raising Committee.

Rita Mallia
Non-Executive Director

A board member since 2003 Rita Mallia is Senior Legal Officer / Co-ordinator for Construction Forestry Mining Energy Union, formerly the Workers Compensation Officer. She is also a Director of the NSW Dust Disease Board, and a Member of the Construction Industry Reference Group.

Patricia Michie
Non-Executive Director

Pro-Vice Chancellor (Research), University of Newcastle, Professor of Psychology, School of Psychology, Faculty of Science and Information Technology University of Newcastle, Patricia Michie joined the board in 2000.

Professor Michie is also Adjunct Professor in the School of Psychiatry & Clinical Neuroscience, University of Western Australia. She was recently appointed Emeritus Professor in the School of Psychology, University of Newcastle.

Resigned: February 2009

Trish Oakley
Non-Executive Director and Company Secretary

Associate Director, Elton Consulting, specialising in strategic communications. Formerly Director, Meridian Media; Chief of Staff, Andrew Refshauge's Office, NSW Government (1995-1999); Press Secretary and Political Strategist for Dr Refshauge as Deputy Leader of the Opposition (1990-1995), and a former ABC journalist. Trish Oakley has been a board member since 2001.

Christos Pantelis
Non-Executive Director

Christos Pantelis is Foundation Professor of Neuropsychiatry and Scientific Director of the Melbourne Neuropsychiatry Centre at The University of Melbourne and Melbourne Health. He is honorary Principal Research Fellow at the Howard Florey Institute and the Centre for Neuroscience Victoria. A board member of the Institute since 2004, he is also on the board of the Mental Illness Fellowship of Victoria and member of the Scientific Advisory Council of Neurosciences Victoria. He sits on the Editorial Boards of several key research journals.

Christopher Rex
Non-Executive Director

A board member since 2006, Christopher Rex has been with Ramsay Health Care since 1995 as Managing Director and previously Chief Operating Officer. He is a former General Manager of Macquarie Hospital Services.

Alexandra Rivers
Non-Executive Director

Alexandra Rivers is a carer, psychologist, ex academic, Member Guardianship Tribunal, NSW; (Guardian and Litern, Children's Court NSW; Guardian and Litern, Administrative Decisions Tribunal NSW;) She is Vice President Schizophrenia Fellowship of NSW, and Aboriginal Education Council of NSW; Member, Governing Committee Australian Consumers' Health Forum. Mental Health Carer and Consumer National Register. She has been a board member since 2003.

Cynthia Shannon Weickert
Non-Executive Director

Cyndi Shannon Weickert is the Macquarie Group Foundation Chair of Schizophrenia Research and formerly Unit Chief, of MiNDS (Molecules in the Neurobiology and Development of Schizophrenia), Clinical Brain Disorders Branch, National Institutes of Health, 2004-2007. Senior Staff Fellow, NIH, NIMH, Clinical Brain Disorders Branch, April 1999 - April 2004. Postdoctoral Intramural Research Training Award-NIH, NIMH Clinical Brain Disorders Branch, 1995-1999. She holds a PhD from Mount Sinai School of Medicine, CUNY, New York, NY, Ph.D. Biomedical Science, 1990 -1995, She has been a board member since 2007.

Jill Wran
Non-Executive Director

Jill Wran joined the board in 2009. She is a Board Member of SMEC Holdings Ltd, and other companies, Chairperson of the Historic Houses Trust, Council member of the University of New England, Honorary Vice-President of the Australian Institute of International Affairs, and Patron of Greening Australia (NSW); formerly a Director of Bilfinger Berger, Abigroup, Ansett New Zealand, the Australian Graduate School of Management, International Grammar School, NSW State Conservatorium of Music, Sydney Symphony Orchestra, Centennial and Moore Parks Trust, and the Sydney Opera House Trust.

Research Overview

The Schizophrenia Research Institute has evolved from a network of scientists with a common interest, to a national organisation with a strategic scientific focus. We believe we will be able to answer key questions about schizophrenia by focusing on three paths:

Developmental neurobiology

The scientific study of the molecular and cellular basis of healthy and abnormal brain development.

Cognitive neuroscience

The scientific study of the biological basis of cognitive functions with the aim of understanding the structure and function of the brain in health and disease.

Epidemiology and population health

The scientific study of the patterns of distribution of disease in populations, the identification of antecedents and risk factors, and the measurement of outcomes or effects of treatment in whole populations.

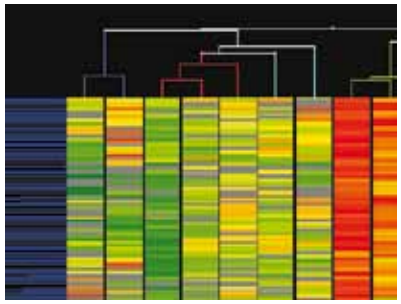
The Australian Schizophrenia Research Bank

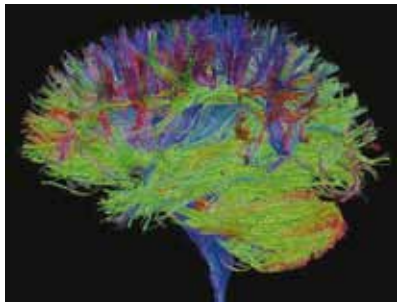
The Australian Schizophrenia Research Bank, the largest national schizophrenia genetics research project launched in 2007, is collecting wide-ranging data on patients with schizophrenia and controls for genetic mapping and use in future research programs.

The bank is a national collaboration for recruiting 2,000 people living with schizophrenia and 2,000 healthy controls in order to obtain brain scans, blood samples and clinical information that will be compiled and cross-referenced in a unique national database. It has gained significant momentum in the past year; over 1,200 people have consented, more than 700 have completed the assessment program – 500 with schizophrenia or related disorders – and volunteer recruitment is still ongoing. The Bank now incorporates the functions of the Schizophrenia Research Register which has contributed significantly to schizophrenia research in NSW, supporting close to 100 schizophrenia research projects across the state since its inception more than 10 years ago.

Chief Investigators from the Australian Schizophrenia Research Bank are already using the facility to study the mechanisms underlying auditory hallucinations in schizophrenia (WA), the sensitivity to unique odours in schizophrenia (VIC), and the genetics of schizophrenia (three studies across NSW and WA).

From July 2010 Australian scientists will be permitted to use the Bank, accessing the rich array of information acquired from our volunteers. It is anticipated that by July 2011 access will be extended to international scientists and commercial organisations.





Australian Schizophrenia Research Bank pioneering Intersect project

Intersect, a newly established e-research organisation based in NSW, supported by the NSW Government and a number of universities, is working to accelerate the use of information and communications technologies in research projects.

The Australian Schizophrenia Research Bank was the first project chosen for support via Intersect's competitive selection process. Intersect has begun a complete database overhaul to create a high quality, commercial-grade facility, which will form the cornerstone of the Bank for the future. The in-kind support from Intersect is estimated at more than $600,000 and includes a team of five software developers, a project manager, and a human-computer interface expert, all working on the project for a six month period. The new database will be completed and delivered by late 2009.

Gift of Hope brain donor program - The Gift of Hope is the only Australian brain donor program dedicated to schizophrenia research. Post mortem human brain tissue is an extremely valuable resource for neurobiological research and by donating brain tissue at death, our volunteers are providing an essential resource to researchers investigating schizophrenia. The extra value of the Gift of Hope program is that by providing clinical and neuropsychological information prior to death, together with brain tissue gathered post-mortem, Gift of Hope donors are enabling scientists to establish relationships between clinical factors and neurocognitive measures during life, genetic characteristics, and alterations in brain tissue that can only be made available and studied after post-mortem.

The Gift of Hope program has seen a recent increase in brain collections and we would very much like to thank the families of these donors for their generous and invaluable contribution to supporting us to make progress towards better treatment and prevention of schizophrenia. We are making some modifications to the manner in which the Gift of Hope program operates, which will overcome current bottlenecks and help us to ensure that all donors are enrolled and assessed as quickly as possible.

If your brother or sister has schizophrenia you are 9 times more likely to develop the illness.

“ It’s been a lesson in growing up,
not to talk about myself too much.
But in the end everything will be alright.
If it’s not alright, then it’s not the end.”

Kathleen Smith – Patient Ambassador

Developmental Neurobiology

Professor Cyndi Shannon Weickert

Schizophrenia Research Laboratory – Hormones and brain development

The work of the Schizophrenia Research Laboratory* made headlines during 2009 when the Macquarie Group Foundation Chair of Schizophrenia Research, Professor Cyndi Shannon Weickert, was the subject of an ABC TV *Australian Story* in May, attracting over one million viewers and increasing visitors to the Institute's website sixfold. The program also highlighted the progress of the Institute's first clinical drug trial being run by the Laboratory.

* The Schizophrenia Research Laboratory is a joint initiative of the Schizophrenia Research Institute, University of NSW, Prince of Wales Medical Research Institute, and the Macquarie Group Foundation. It is supported by NSW Health.

" Given the right circumstances, the right environment, if there was a single scientist who was going to make a big difference in unravelling the nature of this condition it would be her "

Professor Vaughan Carr on Professor Cyndi Shannon Weickert
ABC Australian Story, May 2009.

Hormones and schizophrenia

First clinical drug trial

Following the discovery that a brain receptor that normally stimulates growth in adolescence is hampered in people with schizophrenia, affecting the brain's maturation process, Professor Shannon Weickert's team is trialling a drug called raloxifene. A group of 88 people with schizophrenia are taking the drug, a hormonal modulator that stimulates the oestrogen receptor in the brain, along with their usual antipsychotic medication.

The aim is to learn how the hormone modulator, raloxifene, can influence thought processing in schizophrenia and whether it could be used as a novel therapeutic treatment for cognitive problems in patients. The drug is already used for cancer and osteoporosis. This is its first usage in men with schizophrenia. The Institute thanks NSW Health for a further investment of over $200,000 to support this clinical trial.

Oestrogen gene variant may be a schizophrenia risk factor

A range of research projects have indicated that oestrogen signalling is altered in people with schizophrenia. Onset of the illness usually happens after puberty when sex steroid-triggered changes occur; gender differences in onset age and symptom severity are well documented.

In partnership with the US National Institute of Mental Health, the Schizophrenia Research Laboratory team set out to determine if changes in the oestrogen receptor alpha (ESR1) gene and cortical ESR1 mRNA were linked to schizophrenia. Using post mortem brain tissue and DNA from live patients and controls, the team found that variations in the ESR1 gene were associated with schizophrenia, and that the mechanism of this association may involve alternative gene regulation and transcript processing.

Brain development and schizophrenia

Schizophrenia is widely accepted as a neurodevelopmental disorder, in which the brain's normal maturation process is altered, producing long-term changes in brain structure and function that lead to the debilitating symptoms of this illness. The Institute is investigating brain development, to help identify how the normal developmental trajectory is affected in schizophrenia.

Brain derived neurotrophic factor

Brain derived neurotrophic factor (BDNF) is a protein that acts on certain neurons of the central nervous system, helping to support the survival of existing neurons and encourage the growth and differentiation of new neurons and synapses. The BDNF gene produces four different transcriptions of BDNF, and is active in the hippocampus, cortex, and basal forebrain—areas vital to learning, memory, and higher thinking.

The Institute, together with Australian and overseas research partners, used brain tissue from deceased individuals aged from 71 days to 49 years to examine which transcription of BDNF was most expressed at successive stages of frontal cortex development. These studies revealed that BDNF expression in the human prefrontal cortex changed throughout life, with the highest expression levels seen during infancy. These findings indicate that BDNF plays an important role in synaptic plasticity during the first few years of life, but continues to assist with cell survival over time.

Development differences in male and female brains

Human neuropsychiatric disorders show gender differences in age of onset, prevalence and symptoms. An international collaborative team (from Germany, England, US and Australia), including the Schizophrenia Research Laboratory,

have identified gender differences in gene expression during cortical development that may illuminate the molecular basis of gender biases in vulnerability to brain disorders.

To understand why males and females differ in regards to schizophrenia, the team first sought to understand how the male and female brain may differ normally, using post-mortem brain tissue to survey the expression of 55,000 DNA-RNA transcripts in the prefrontal cortex of individuals ranging in age from 1 month to 50 years.

Among many other potentially valuable results, 25 genes on the sex chromosomes were found to differ in expression between males and females – a threefold increase in the detection of Y chromosome genes from those previously identified as expressed in frontal cortex development. This is important as researchers once thought that Y chromosome genes were not active in the brain and now we know that genes residing on this male specific chromosome are differentially influencing developmental events in humans.

Lipid binding protein investigation

The Schizophrenia Research Laboratory participated in an investigation of Apolipoprotein D (apoD): a lipid binding protein expressed in the prefrontal cortex of the adult brain, where its function is largely unknown. The team used human brain tissue from individuals aged from 40 days to 49 years.

Alterations in apoD expression have been implicated in several psychiatric and neurodegenerative diseases. This study revealed that apoD expression is increased throughout life in the human prefrontal cortex and that this is correlated with genetic and biochemical markers of oxidative stress. The next step will be to see if apoD is altered in schizophrenia.

Role of ErbB receptors

The subventricular zone (SVZ) of the brain is of interest to schizophrenia researchers because it harbours the largest population of the neural stem cells that construct and maintain the adult brain. If schizophrenia is a neurodevelopmental illness, it may be that the SVZ is where the brain's development starts to go wrong.

Professor Shannon Weickert's team joined with US centres in investigating the ErbB receptors that regulate neurogenesis (birth of new neuronal cells) in the SVZ. Brain tissue from individuals ranging from infants to adults was used to measure the levels of the four ErbB subtypes in the SVZ at each stage of brain development. This research discovered that levels of ErbB1 and ErbB4 were highest in very young babies, suggesting that these receptors played more salient roles in early brain formation than others.

Genes and schizophrenia

MicroRNAs are exceptionally small pieces of RNA derived from non-coding genetic material. Their only function is to control the activity of other genes. Despite their size, these small molecules have a powerful influence, with a single microRNA having the capacity to subtly affect thousands of genes. They are very important in the development of the brain and are also involved in neural function and plasticity, which underpins the brains ability to learn and adapt to challenges throughout life.

Using post-mortem tissue, the Institute's University of Newcastle team previously demonstrated that the expression of miR-181b, one specific type of microRNA, was altered in the superior temporal gyrus of schizophrenia patients.

The team has now discovered that this was just the tip of the iceberg, as widespread increases in microRNA production and expression are seen throughout several regions of brains in people with schizophrenia. These dramatically elevated levels of microRNA would regulate the expression of a large number of genes, many of which have already been implicated in the illness.

This phenomenon could represent an important dimension in the pathogenesis of schizophrenia, as it represents a possible common mechanism by which many genes could be altered simultaneously. The evidence also supports the idea that schizophrenia could occur because of change in the regulation of many genes rather than specific gene mutations. Importantly, microRNA could be novel targets for drug development.

Emotional response and the amygdala

The amygdala is a sub-cortical brain region that has been shown to be decreased in volume in schizophrenia. As the amygdala is involved with emotional responses and their regulation, any dysfunction here may be implicated in the emotional processing deficits observed in schizophrenia.

The Institute's team at the University of Newcastle investigated genes associated with the cytomatrix active zone (CAZ), a specialised cellular structure regulating release of vesicles. Using post-mortem amygdala tissue from patients and controls, the team found increased protein expression in relation to two CAZ genes – providing further evidence that these specific amygdala genes are involved in the neurobiology of schizophrenia. The pattern of expression indicated that these changes were not due to antipsychotic medication, and has important implications for schizophrenia-related amygdala dysfunction.

Changes in the hippocampus

Many studies have shown hippocampus abnormalities in schizophrenia, such as decreased synaptic protein levels, and decreased serotonin receptor density. A proteomics study of the hippocampus in schizophrenia previously found 16 proteins altered in expression. Interestingly, in addition to decreased hippocampus volume preceding schizophrenia onset, MRI studies have also found greater volume reduction in the anterior hippocampus (AH) compared to the posterior hippocampus (PH).

From this and other evidence, the Institute's team at the University of Sydney hypothesised that comparative protein profiles of the AH and PH would show a larger number of alterations in the AH than the PH, based upon differences in function and connectivity of the two regions, and upon the degree of pathology reported in the AH.

Using post-mortem brain tissue from the NSW Tissue Resource Centre, the Sydney team applied 2-D gel electrophoresis and mass spectrometry, and found that a larger number of protein spots were differentially expressed in the AH (43) compared to the PH (16) – representing 34 and 14 unique proteins, respectively. As these proteins are involved in cytoskeleton structure, neurotransmission, and mitochondrial function, these results directly connect the abnormal genetic processes in the AH to the core pathology of schizophrenia.

Investigation of gene expression in adolescence

In partnership with scientists at the University of Cambridge, UK, and the Max Planck Institute, Germany, the Institute participated in an investigation of gene expression, focusing on the prefrontal cortex between ages 15 and 25.

Using brain tissue from 44 non-schizophrenia donors ranging in age from 1 month to 49 years, the team identified genes whose expression levels were at their highest or lowest during late adolescence/early adulthood. Around 2,000 genes were thus identified, including a number previously associated with schizophrenia. Genes associated with synaptic development underwent particularly extensive change throughout this period of late adolescence. These findings indicate that many processes known to be affected in schizophrenia are critical to adolescent brain development.

How the Brain Communicates

Antipsychotics and weight gain

Some atypical antipsychotics induce weight gain in patients but the mechanisms for this are not fully understood. The research team at the University of Wollongong hypothesised that the medications might be affecting the dorsal vagal complex of the brain stem and the endogenous cannabinoid system, which are both involved in appetite signalling and food intake. The team dosed groups of laboratory animals with a number of different antipsychotic drugs, and then measured changes in cannabinoid CB1 receptor density, food intake and weight gain. The chronic (12-week) olanzapine treated group showed a 46 percent decrease in cannabinoid receptor binding, which was correlated with increased food intake and weight gain. These results indicate that antipsychotic-induced weight gain that occurs with olanzapine may be through the modulation of cannabinoid receptors in the dorsal vagal complex.

Disrupted brain development

Much evidence suggests that alterations in neurotransmitter systems, possibly reflecting defects in early neurodevelopmental processes, play an important role in the aetiology of schizophrenia. Two transmitter systems under study are dopamine and glutamate. The Institute's research teams at the University of Wollongong and the Australian Nuclear Science and Technology Organisation (ANSTO) have been investigating the role of the glutamate system and its receptors in brain development by treating infant or adult laboratory animals with the glutamate/NMDA antagonist phencyclidine (PCP), thus suppressing NMDA function. PCP alters development of the cortex.

The Wollongong team gave PCP injections to infant rats, and found altered expression of muscarinic receptors in the prefrontal cortex of the animals when they reached the age of adolescence.

Hotspot schizophrenia brain areas

The Wollongong/ANSTO team also measured the effects of PCP treatment on brain areas that are implicated in schizophrenia (such as the thalamus, hippocampus and prefrontal cortex) in developing rats over the long-term.

PCP treated rats showed altered development of the doperminergic system, confirming that interfering with the NMDA receptor function has long lasting behavioural and neurochemical effects.

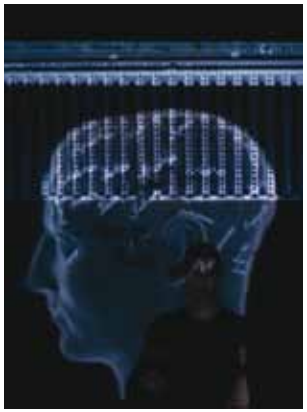
In view of the evidence that PCP produces a syndrome in normal humans that resembles schizophrenia, the Institute team at ANSTO investigated the PCP/NMDA issue in adult animals by examining the short-term effects of PCP in the brain four hours after acute drug administration. An overall decrease in levels of AMPA (another glutamatergic receptor) in brain regions that mediate cognitive function was found.


Ashton

"The joys in my life - playing music with the band, presenting a community radio show and eating at nice restaurants with my family!"

Richard Schweizer – Patient Ambassador

Cognitive Neuroscience



Brain Imaging

Towards a test for risk of schizophrenia

Preventing and curing schizophrenia demands extensive research across a wide range of disciplines. The Institute has collaborated with Australian, US and Japanese research centres, combining various brain imaging techniques with measures of perception, cognition and daily functioning to achieve new insights into schizophrenia. The integration of multiple sources of data provides more information than any one source alone.

The team linked EEG data with everyday functioning and MRI measures, revealing preliminary evidence that reductions of regional grey matter in the auditory cortex of people with schizophrenia is associated with impaired auditory processing and poor functioning. The research team is continuing to investigate how these changes in brain structure and function affect sensitivity to different sound characteristics in people with schizophrenia, unravelling the specific components of the auditory processing system affected in the disorder.

Adjacent to this collaboration is a five year study aiming to define the factors involved in schizophrenia onset. Recruiting young people aged 12-25 years from clinical centres in Newcastle, Orange and Sydney, the study is identifying patients deemed to be at ultra-high risk (UHR), of whom 20-30 percent will develop psychosis within 12 months. Each UHR patient is being age/sex matched with a healthy control, and both are receiving a sequence of tests devised from recent discoveries – including MRI brain scans, DNA profiling, and a 'mismatch negativity' test to detect particular auditory processing abnormalities. The test data of those people who go on to develop schizophrenia will be compared with UHR subjects who do not, and with their partnered controls.

Alzheimer's and schizophrenia

Researchers from Italy, Switzerland, the US and Australia collaborated to investigate why elderly schizophrenia patients frequently develop cognitive impairment. MRI brain scans of such patients showed structural abnormalities, but how these related to behavioural symptoms was unknown.

MRI scans were taken of 20 elderly schizophrenia patients, 20 Alzheimer's patients, and 20 healthy elders. 3D profiles were made of the structural differences in grey matter volume between groups.

It was found that the elderly schizophrenia patients had significantly less grey matter volume compared to healthy controls, but greater grey matter volume than Alzheimer's patients. Brain regions in schizophrenia patients showing the most grey matter loss were the cingulate gyrus and orbitofrontal cortex: a pattern of loss remarkably uncommon in Alzheimer's patients.

Studies of much larger patient groups are needed to interpret the causes and effects of these schizophrenia-related grey matter abnormalities.

Mismatch negativity

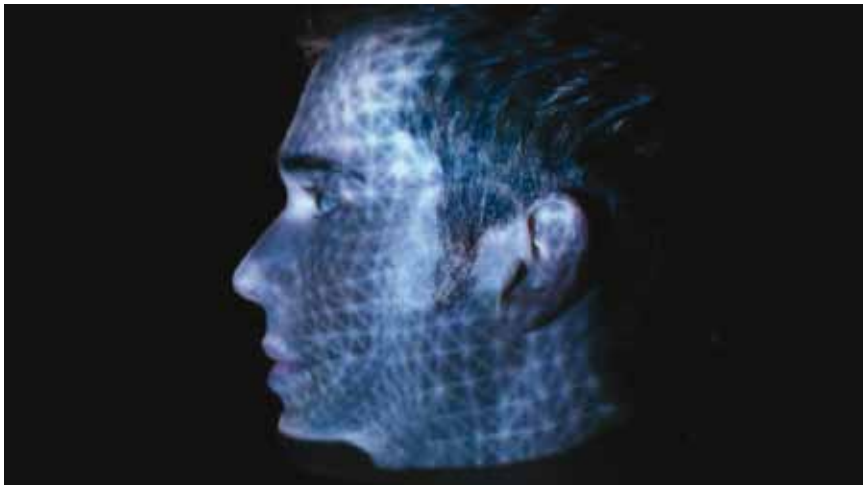
Event-related potentials (ERPs) are a non-invasive way of measuring brain activity during cognitive processing. Among other applications, ERPs are used to measure mismatch negativity (MMN), an event-related brain response sensitive to deviations within a sequence of repetitive auditory stimuli. MMN is thought to reflect short-term sensory memory and is independent of higher-level cognitive processes. MMN response is diminished in patients with schizophrenia.

Led by the Institute's Cognition & Connectivity Research Panel, a University of Newcastle team investigated if and how cortical volume loss in schizophrenia relates to MMN characteristics. MMNs were recorded from 18 patients and 18 controls, and MRI scans were taken of all subjects to measure grey matter volumes.

It was found that each patient's degree of MMN reduction correlated with their degree of day-to-day functional impairment, and also with their degree of grey matter tissue loss.

The mechanisms of emotion

Impaired social cognition and poor social functioning are hallmarks of schizophrenia, and may limit interpersonal relationships and vocational potential. There is now, however, considerable evidence that such behavioural deficits are due to functional disabilities that may be remediated by training or targeted by new medications.



If your grandparent has schizophrenia, you are 5 times more likely to develop the illness.

Emotional face processing

Impaired facial effect recognition is a prominent feature of schizophrenia that is linked to negative symptom severity and poor functional outcome. Scientists in Sydney and Newcastle conducted a review of published evidence aimed at answering four key questions: What is the major component of the deficit? Does it have a neurobiological basis? When does it appear in development? Can it be remediated?

Synthesising current studies, the review discussed the deficits in visual attention to facial features seen in schizophrenia and how reluctance to make eye contact is thought to be involved in misinterpretation of fearful facial expressions in others. Disruptions to the normal development of the amygdala and other late-maturing structures during adolescence are thought to be involved in these face processing problems. Behavioural training and pharmaceutical therapies for these difficulties are still being developed, but show promising early results.

Improving emotion perception

Visual scan path (VSP) technology has allowed researchers to establish that aberrations in allocation of visual attention are characteristic of schizophrenia. Studies of VSPs have identified a consistent scanning pattern comprising fewer and longer fixations. When viewing human faces, schizophrenia patients direct fewer fixations to the salient features (eyes, nose, mouth) and this may contribute to deficits in facial emotion perception.

Institute researchers at the Macquarie Centre for Cognitive Science recruited 40 patients, 26 of whom completed emotion recognition training using the Micro-Expression Training Tool (METT). Use of this computerised training program increased the number of fixations to facial features, and improved emotion recognition accuracy in this group.

This study provides the first evidence of the capacity to modify VSPs via a self-administered computer-based training program designed to improve facial emotion perception in schizophrenia.

Embarrassment display

A research team at the University of NSW broke new ground in measuring whether schizophrenia disrupts the ability to experience the self-conscious emotion of embarrassment. 27 participants with schizophrenia and 28 controls were exposed to a mildly embarrassing situation – a loud noise elicited a startle-reflex while participants were being videotaped – and their behavioural and physiological responses were measured. Results showed there was no difference between the two groups in the level of embarrassment displayed following the startle response.

Within the schizophrenia group, however, greater embarrassment was associated with better social functioning and lower negative effect. These findings are consistent with other evidence showing that the experience of self-conscious emotion is important to social interaction and may be indicative of enhanced social functioning in those with schizophrenia.

Hallucinations and delusions

'Hearing voices' and belief in bizarre delusions are probably the symptoms most commonly associated with schizophrenia, yet little is known about how the brain produces them. The Institute collaborated with centres and scientists in the UK and Western Australia to investigate the issue.

Why doesn't everyone hear voices?

Institute affiliated centres in Sydney teamed up with the Department of Psychology at Durham University, UK, to investigate the differences between normal 'inner speech' (thinking in words) and the auditory verbal hallucinations (AVHs) of schizophrenia. A current hypothesis is that AVHs result from the misattribution of the subject's own inner speech to an independent source: the subject thinks in words, but somehow hears those thoughts as an external voice or voices.

The study asked 29 patients (all reporting AVHs), and 42 healthy controls a series of semi-structured questions about their experiences of AVHs (if present) and inner speech respectively. Questions included, "When you are thinking, do you ever refer to yourself as 'You'?", and, "Do you talk to yourself in your thoughts, telling yourself what to do, or commenting on what's happening?" Perhaps surprisingly, the overall study found no discernable differences between the inner-speech characteristics reported by the voice-hearing patients and the healthy controls – inner speech in both groups rarely had vocal characteristics or involved third-person pronouns, which are common in "conversing voices" experienced by people with schizophrenia. In addition, the inner speech typically used by the schizophrenia patients to answer their own voices was not attributed to the voices. These findings suggest that misattribution of inner speech is not exclusively responsible for AVHs in schizophrenia patients, and has interesting implications for some current theories on inner-speech and AVHs.

Memory and hallucination

Schizophrenia patients with auditory verbal hallucinations (AVHs) exhibit deficits in memory and intentional inhibition. As hallucinations also occur in the general population, a research team based at the University of Western Australia set out to discover a possible common causative mechanism.

A group of 615 university undergraduates completed a questionnaire designed to measure individual tendencies to hallucinate, then a selection completed a voice-location task to test context memory ability.

The results showed that although some healthy individuals are more susceptible to hallucinations, the frequency and other features of these AVHs differ from those experienced by schizophrenia patients. Unlike people with schizophrenia, healthy individuals predisposed to hallucinate did not have any difficulty remembering the source of distinct spoken words, and showed no association between AVH frequency and memory deficits. These findings indicate that the differences between hallucinations experienced by members of the general population compared to people with schizophrenia are greater than previously recognised. This has important implications for future research into AVHs and also suggests that different treatment strategies may be needed for different groups of individuals who hear voices.

Unreasonable nature of delusion

A number of NSW research centres collaborated on a study of delusions in schizophrenia involving 35 patients with a history of delusions, and 34 healthy controls. Participants completed a number of questionnaires and a set of probabilistic-reasoning and theory-of-mind tasks. Compared to healthy controls, patients showed a bias towards jumping to conclusions; towards over-adjusting when confronted with a change of evidence; and towards attributing the cause of negative events to external sources. Theory of mind difficulties were also present in the delusion-prone patients and were associated with the probabilistic-reasoning biases, suggesting that common mechanisms are involved in these deficits (with the exception of attribution bias). Interestingly, these associations suggest that people with schizophrenia may have difficulty inhibiting their own current experience in order to consider conflicting viewpoints.

Controlling inhibitions

An Institute-supported team at the School of Psychology, Western Australia, has investigated the role of poor 'inhibitory control' in the development of hallucinations, delusions and thought disorder. 'Inhibition' is often used as an umbrella term for the group of executive control processes that serve to prevent irrelevant thoughts and external stimuli from interfering with goal-directed thoughts and behaviours. This inhibitory control can be categorised as 'intentional' when it is consciously and deliberately applied or as 'unintentional' when it happens automatically.

A group of 61 schizophrenia patients and 34 healthy controls participated in the study. To test intentional inhibitory control, each subject was asked to read aloud a short story (125 words) printed in italic text interspersed amid a second unrelated story printed in plain text. To test *unintentional* inhibitory control, subjects were asked to read aloud and remember ten words presented sequentially on a screen, and this process was repeated several times. With each subsequent set of ten words, participants were therefore required to automatically inhibit previously learned word sets when recalling as many words as possible from the current task.

The patients' overall performance on the automatic unintentional inhibition tests matched that of controls; however they were found to be impaired on the intentional inhibition tasks. These results are consistent with previous studies showing impaired intentional but not automatic cognitive functions in schizophrenia. This suggests that intentional cognitive control impairments in schizophrenia are not specific to inhibition, but are more general, and could contribute to the development of thought disorder, disorganised speech and other symptoms. Remedial programs devised to improve intentional inhibition performance may consequently reduce some symptoms of schizophrenia.

“My animals are the glue that binds my life. They give me purpose and I’m lucky to have them.”

Katrina Clutterbuck – Patient Ambassador

Epidemiology, Population Health & Evidence Library

The Institute's CEO, Professor Vaughan Carr has been appointed the Professor of Schizophrenia Epidemiology and Population Health at the University of New South Wales.

Epidemiology is the scientific study of health and disease in populations. It aims to pinpoint risk factors and track health outcomes across communities. It includes the study of factors that affect the health of populations such as risk and protective factors, and the population impacts of treatments and preventative interventions. In schizophrenia, epidemiological research has shown important regional differences in incidence and prevalence, highlighted gender differences, confirmed the effects of migrant status, season of birth, urban rearing and cognitive impairments as risk factors, and identified the role of cannabis as a component cause of schizophrenia. Record linkage is a powerful epidemiological tool in which various health and other databases such as birth registers can be combined to study population cohorts prospectively and measure health outcomes in the long-term.

Building schizophrenia epidemiology capacity in NSW will strengthen the Institute's research profile. It will do this by generating new hypotheses to be tested in the neurobiology laboratories and clinical research settings and by testing the impact of various factors such as vulnerability indicators, protective influences and innovative approaches to treatment on the development, course and outcome of schizophrenia.

The Chair is based at the Mental Health Unit at St Vincent's Hospital, Sydney and is a joint project between the Schizophrenia Research Institute and the University of New South Wales, with funding from NSW Health of $2.125million over 5 years.

Schizophrenia Library

The volume of worldwide research about schizophrenia continues to expand as scientists work to understand this complex disorder. Under the direction of Professor Carr the Schizophrenia Library will be an online source of the most up-to-date information about schizophrenia for the general community, mental health clinicians, scientists and policy makers. The Library will be launched in early 2010 will help researchers identify gaps for future investigation.

It will include an assessment of over 2,000 systematic reviews on aspects of schizophrenia and related psychotic disorders. After being screened, these reviews are then divided into around 200 topics, and a summary of the research and evidence in relation to each topic will be available.

The Library will include a brief commentary on each topic, providing general information about the area examined, including the strength and quality of the evidence with respect to schizophrenia.

This valuable online resource will be the first service that the Institute provides to the community at large and will help inform and educate the general public about schizophrenia.

The Longitudinal Child Health Study

Schizophrenia is understood to be a neurodevelopmental disorder with its origins much earlier in life than the first psychotic symptoms; however, the early life factors involved in the disorder are not well understood. This proposed large-scale study is being designed to identify risk and protective factors in children that contribute to vulnerability or resilience to the development of mental disorders, including schizophrenia, as well as other social outcomes in adolescence and early adulthood.

The initial pilot study, which is underway, involves linking existing population-based de-identified data such as birth and education records, to identify early markers that may be associated with health and wellbeing later in life. Several databases with potentially valuable data for following the developmental trajectories of children have been identified, and linkage is currently being trialled.

The second phase of the study will then involve following a large cohort of children over a 15-20 year period, to identify risk and protective factors, and mental health-related outcomes during adolescence and early adulthood. This study will focus particularly on children's emotion regulation; social behaviour; academic achievement and cognitive function; and developmental motor milestones and motor coordination. The knowledge gained on the developmental trajectories in these children may eventually help to establish effective early detection and prevention program

If you have a first cousin with schizophrenia you are twice as likely to develop the illness.

Community

Dr Kelly Newell

Teresa du Bois

Our Scientists - Research Students and Awards

Nurturing our scientists is very important for the future of schizophrenia research. To recognise and reward the dedication and achievements of our gifted researchers, the Institute presents two annual awards: the Early Career Researcher Award and the Postgraduate Student Award

Dr Kelly Newell was named the Institute's Early Career Researcher. From Prof. Xu-Feng Huang's laboratory at the University of Wollongong, Dr Newell has made an important contribution to the schizophrenia research field, namely helping to elucidate the role of the posterior cingulate cortex in schizophrenia and establishing novel animal models for schizophrenia research.

In the past year she has published five research papers, had her work presented at two major international conferences and been awarded $20,000 in research funding to support her work. Dr Newell was also successful in obtaining an NHMRC Project Grant worth $420,000 to further her research. She has received $7,000 to support her schizophrenia research studies as part of this award.

Teresa du Bois, from the same research laboratory at Wollongong secured the Postgraduate Student award. Her PhD project is focused on the NMDA receptor and developmental issues in relation to schizophrenia in an animal model.

In the past year she has published two research papers and a book chapter (two more are submitted), had her work presented at four major national and international conferences and was awarded a grant to attend the major international conference of the Schizophrenia International Research Society in Venice. She has received an award of $3,000 towards her schizophrenia research.

Fundraising and Marketing

The global financial crisis doesn't mean much to people living with schizophrenia. Everything is relative when the liberty of your mind is taken and your life is put on hold. Research cannot slow down as the sense of urgency is real for all those affected by this highly disabling illness.

We are very fortunate to have the continued support of NSW Health and this year Institute scientists were awarded a record $3million in National Health and Medical Research Council funding.

This year we have seen income growth in the areas of direct mail, grants and community support but a decline in overall corporate donations.

However our major partners have shown true commitment to our cause with Macquarie Group Foundation, IFSA (Investment and Financial Services Association) and The Pratt Foundation providing very substantial support for our key research programs. We also have strong ongoing partnerships with Ramsay Health Care, Janssen-Cilag, Lundbeck, Abigroup and Paynter Dixon.

Our thanks to all our supporters – it is so good to have you on this journey with us and we are grateful for your commitment during harder times.

Loss of a great philanthropist

The Institute was saddened at the death this year of Richard Pratt. A great leader in Australian philanthropy, he was a generous spirited man who made a huge difference to so many lives.

The Pratt Foundation continues as a wonderful tribute to his life and his family. The Foundation is a major supporter of the Australian Schizophrenia Research Bank, a vital source for researchers worldwide that will live on for many years to come.

In recognition of his commitment to medical research, the Institute will launch 'The Richard Pratt Fellowship' later in the year to assist the professional development of a Victorian schizophrenia researcher.

Richard Pratt

Cocktails & Consciousness

Over 150 guests attended the annual supporters' thank you event, Cocktails and Consciousness, in October at the Garvan Institute. Judy Gibson was announced as Life Governor and to honour Jack and Judy's commitment, the Jack and Judy Gibson Fellowship was announced.

Thanks in particular must go to our research volunteer and patient ambassador, Katrina Clutterbuck for sharing her personal story and her drive for being involved in our research. The evening drew to a close with a beautiful performance from the King's School Senior Choir. Many thanks to the schoolboys who sang, to Yalumba for the wine and to Ramsay Health Care for sponsoring the event.

Awareness

Schizophrenia Awareness Week in May saw the greatest increase in awareness in the history of the Institute.

ABC Australian Story

Professor Cyndi Shannon Weickert's commitment to schizophrenia research was evident when she agreed to be part of the Australian Story, despite the tragic loss of her twin brother, Scott David Shannon. The Institute offers its condolences and thanks to her for her personal drive to raise awareness for schizophrenia. The ABC Australian Story was viewed by over 1million people, and resulted in over 1,000 interested Australians contacting the Institute. The Institute thanks McKesson Asia Pacific for providing call centre help to support our small central office.

SwearStop - Giving it up for Schizophrenia

May also saw the launch of the Institute's first online fundraising campaign SwearStop, where friends sponsored friends online to give up swearing for the week. Many thanks to our SwearStop Ambassadors, Celebrity Chef Ben O'Donoghue, Bondi Rescue Lifesavers, Hoppo and Corey, Sydney FC's Terry McFlynn, Glenn Wheeler and Jonathon Welch who helped raise awareness.

With thanks to Ramsay Health Care for sponsoring the online event, it resulted donations over $30,000. The mass market media coverage, with thanks to Ogilvy PR Health, attracted the widest audience reach for the Institute.

"I love public speaking, comedy and cooking for friends – I am legendary for my dinner parties."

Angela Greensill – Patient Ambassador

Partners and Supporters

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NSW HEALTH

Australian Government
National Health and Medical Research Council

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PRATT FOUNDATION

The Hunt Family Foundation

thynereid FOUNDATION

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Constructing Australia's Future

PAYNTER DIXON
HEALTH & AGEING BUILDING SUCCESS

Thank you to all our supporters.

For privacy reasons we have chosen not to list all our individual supporters but would like to talk this opportunity to thank and acknowledge these kind people who have given us gifts – this generosity and commitment of the community is vital to our ongoing success.

Patron

Her Excellency Professor Marie Bashir AC

Life Governors

Don McDonald

Judy Gibson

SwearStop Ambassadors

Ben O'Donoghue

Bondi Rescue Lifesavers, Hoppo and Corey

Terry McFlynn

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Australian Charities Fund

Charities Aid Foundation (CAF)

Deutsche Bank

Insurance Australia Group (IAG)

Community Groups

Hornsby Ku-Ring-Gai Assn Action Of Mental Health

Kurri Kurri Lions Club Inc

New South Wales Nurses' Association

NSW Down to Earth Club

Rotary Club of North Sydney, Inc.

Many thanks to Bruce Usher for providing the majority of photography for this annual report and to Photolibrary for providing the images for the front cover

Schizophrenia Research Institute Finance

The abridged consolidated financial position, accounts and financial performance for the year ended 30 June 2009 have been prepared from audited financial statements and passed by the Board of Directors, who are responsible for the presentation of those financial statements and the information they contain.
For a better understanding of the scope of the audit by KPMG, this report should be read in conjunction with KPMG's report on the abridged financial statements.

This report can be obtained from:

Schizophrenia Research Institute
405 Liverpool Street
Darlinghurst 2010

Financial Performance for the year ended 30 June 2009

Income*	**2009**	**2008**
Fundraising	783,891	888,838
External grant income	4,186,509	3,365,215
Investment income	25,388	-
Sundry income	91,787	108,945
Total	5,087,575	4,362,998
Less Expenses		
Fundraising, Marketing & Communications	345,313	287,404
Administration	221,871	217,870
Investment	4,343	-
Research	3,902,451	3,328,103
Total	4,473,978	3,833,377
Net Surplus (loss)	613,597	529,621
Opening retained earnings	1,311,740	782,119
Transfer to retained earnings	613,597	529,621
Available for sale reserve	10,202	-
Closing retained earnings	1,935,539	1,311,740
Retained earnings	1,935,539	1,311,740

* Fundraising includes direct mail appeals, corporate partnerships, major gifts and community. External grants includes government, peer reviewed grants, foundations and major campaign agreements.

Scientific Panels and Members

Research Council

Professor Vaughan Carr
Schizophrenia Research Institute
CEO & Scientific Director

Mr Daren Draganic
Schizophrenia Research Institute
Director of Operations

Dr Melissa Green
Co-Convenor, Cognition
and Connectivity Panel

Professor Clive Harper
Co-Convenor, Schizophrenia
Research Infrastructure Panel

Professor Xu-Feng Huang
Co-Convenor, Developmental
Neurobiology Panel

Dr Carmel Loughland
Co-Convenor, Schizophrenia
Research Infrastructure Panel &
Schizophrenia Research Institute
Employee Representative

Professor Patricia Michie
Schizophrenia Research Institute
Board Representative

Associate Professor Ulrich Schall
Co-Convenor, Cognition
and Connectivity Panel

Professor Peter Schofield
Developmental Neurobiology
Panel representative

Professor Cyndi Shannon Weickert
Macquarie Group Foundation Chair of
Schizophrenia Research & Co-Convenor,
Developmental Neurobiology Panel

Cognition and Connectivity Panel

Dr Rebbekah Atkinson
University of Newcastle
(from 3 November 2008)

Dr Jo Badcock
University of Western Australia

Associate Professor Amanda Baker
University of Newcastle

Dr Linda Campbell
University of Newcastle

Professor Vaughan Carr
Schizophrenia Research Institute
CEO and Scientific Director

Dr Martin Cohen
University of Newcastle

Mr Gavin Cooper
Schizophrenia Research Institute
System Administrator

Mr Daren Draganic
Schizophrenia Research Institute
Director of Operations

Ms Liesl Duffy
Schizophrenia Research Institute
Research Coordinator

Ms Rickie-Leigh Elliot
University of Newcastle
(from 4 February 2009)

Dr Melissa Green
University of New South Wales
(Co-Convenor)

Dr Anthony Harris
Westmead Hospital

Ms Felicity Harris
Schizophrenia Research Institute
Project Officer (from 24 March 2008)

Dr Julie Henry
University of New South Wales

Prof Assen Jablensky
University of Western Australia
(from 1 January 2008)

Dr Frini Karayanidis
University of Newcastle

Associate Professor Robyn Langdon
Macquarie University

Prof Rhoshel Lenroot
Prince of Wales Medical Research
Institute (from 30 June 2009)

Dr Carmel Loughland
Schizophrenia Research Institute
Senior Research Fellow

Dr Gin Malhi
University of Sydney

Dr Pamela Marsh
Macquarie University

Ms Kathryn McCabe
Schizophrenia Research Institute
Research Assistant
(until 10 November 2008)

Professor Patricia Michie
University of Newcastle

Dr Richard Morris
Prince of Wales Medical Research
Institute (from 1 June 2009)

Dr Tamo Nakamura
University of Newcastle
(from 1 January 2009)

Dr Georgina Paulik
Bondi Junction Community
Health Centre (from 14 April 2009)

Mr Paul Rasser
Schizophrenia Research Institute
Senior Research Officer

Associate Professor Ulrich Schall
University of Newcastle (Co-Convenor)

Dr Marc Seal
Melbourne Neuropsychiatry Centre

Professor Cyndi Shannon Weickert
Macquarie Group Foundation
Chair of Schizophrenia Research

Dr Nadia Solowij
University of Wollongong

Dr Tirupati Srinivasan
University of Newcastle

Dr Helen Stain
Centre for Rural and Remote
Mental Health

Dr Renate Thienel
Centre for Rural and Remote
Mental Health

Dr Flavie Waters
University of Western Australia
(from 1 August 2008)

Dr Thomas Weickert
Prince of Wales Medical
Research Institute

Associate Professor Lea Williams
Westmead Hospital

Developmental Neurobiology Panel

Dr Jonathon Arnold
University of Sydney

Dr Nikola Bowden
University of Newcastle

Dr Murray Cairns
Schizophrenia Research Institute
Senior Research Officer

Professor Vaughan Carr
Schizophrenia Research Institute
CEO and Scientific Director

Dr Vibeke Catts
Prince of Wales Medical
Research Institute

Associate Professor Loris Chahl
University of Newcastle

Ms Rose Chesworth
Schizophrenia Research Institute
Research Assistant

Dr Victoria Dalton
Schizophrenia Research Institute
Research Officer

Dr Irina Dedova
Schizophrenia Research Institute
Senior Research Officer

Dr Chao Deng
University of Wollongong

Mr Daren Draganic
Schizophrenia Research Institute
Director of Operations

Dr Teresa du Bois
University of Wollongong
(from 15 May 2009)

Ms Liesl Duffy
Schizophrenia Research Institute
Research Coordinator

Dr Carlotta Duncan
Prince of Wales Medical
Research Institute (from 1 December
2008 until 30 March 2009)

Dr Francesca Fernandez-Enright
University of Wollongong
(from 1 April 2009)

Dr Elisabeth Frank
Schizophrenia Research Institute
Research Officer

Dr Janice Fullerton
Prince of Wales Medical
Research Institute

Dr Samantha Fung
Prince of Wales Medical
Research Institute

Ms Mei Han
Schizophrenia Research Institute
Research Assistant

Associate Professor Herbert Herzog
The Garvan Institute
of Medical Research

Dr Tina Hinton
University of Sydney

Professor Xu-Feng Huang
University of Wollongong (Co-Convenor)

Professor Assen Jablensky
University of Western Australia

Professor Graham Johnston
University of Sydney

Dr Tim Karl
Prince of Wales Medical
Research Institute

Prof Simon Killcross
University of New South Wales
(from 18 June 2009)

Dr John Kwok
Prince of Wales Medical
Research Institute

Ms Kelly Liu
Schizophrenia Research Institute
Research Assistant

Dr Leonora Long
Schizophrenia Research Institute
Research Officer

Dr Richard Morris
Schizophrenia Research Institute
Research Officer
(until 1 June 2009)

Dr Kelly Newell
University of Wollongong

Dr Penny Newson
University of Newcastle

Professor Peter Schofield
Prince of Wales Medical
Research Institute

Professor Rodney Scott
Hunter Area Pathology Service

Professor Cyndi Shannon Weickert
Macquarie Group Foundation Chair of
Schizophrenia Research (Co-Convenor)

Dr Sinthuja Sivagnanasundaram
Prince of Wales Medical
Research Institute
(until 30 September 2008)

Dr Paul Tooney
University of Newcastle

Dr Mathieu Verdurand
Schizophrenia Research Institute
Research Officer
(from 5 June 2009)

Dr Bryce Vissel
The Garvan Institute
of Medical Research

Ms Hongquin Wang
Australia Nuclear Science
and Technology Organisation

Dr Jenny Wong
Prince of Wales Medical
Research Institute

Dr Katerina Zavitsanou
Australia Nuclear Science
and Technology Organisation

Schizophrenia Research Infrastructure Panel

Professor Vaughan Carr
Schizophrenia Research Institute
CEO and Scientific Director

Ms Janelle Collins-Langworthy
ASRB Genetics Technical Officer

Ms Lisa Dawson
ASRB Clinical Assessment Officer
(until 1 March 2009)

Dr Irina Dedova
Schizophrenia Research Institute TRC
Coordinator/Senior Research Officer

Ms Sandra Diminic
ASRB Clinical Assessment Officer
(until 1 March 2009)

Dr Marcus Doebrich
Schizophrenia Research Institute
Senior Research Officer

Mr Daren Draganic
Schizophrenia Research Institute
Director of Operations

Ms Liesl Duffy
Schizophrenia Research Institute
Research Coordinator

Associate Professor Jo Duflou
Department of Forensic Medicine

Ms Cheryl Filippich
ASRB Technical Officer
(until 1 March 2009)

Ms Therese Garrick
University of Sydney
(until 30 September 2008)

Ms Juliette Gillies
Schizophrenia Research Institute
TRC Administrative Coordinator

Professor Clive Harper
University of Sydney (Co-Convenor)

Ms Sarah Howell
University of Western Australia

Professor Assen Jablensky
University of Western Australia

Mr Terry Lewin
University of Newcastle

Ms Yen Lim
Schizophrenia Research Institute
Clinical Assessment Officer

Dr Carmel Loughland
Schizophrenia Research Institute Senior
Research Fellow / ASRB Manager
(Co-Convenor)

Ms Antonia Merritt
ASRB Clinical Assessment Officer
(until 1 March 2009)

Dr Bharti Morar
ASRB Genetics Technical Officer

Dr Kelly Mouat
ASRB Clinical Assessment Officer
(until 1 March 2009)

Dr Aslam Nasir
ASRB IT Office (from 11 August 2008)

Ms Siobhan Quinn
Schizophrenia Research Institute
Clinical Assessment Officer

Ms Jaci Richards
Schizophrenia Research Institute
Clinical Assessment Officer

Prof Rodney Scott
Hunter Area Pathology Service

Dr Marc Seal
Melbourne Neuropsychiatry Centre

Ms Donna Sheedy
University of Sydney
(from 30 June 2009)

Ms Nina Sundqvist
Schizophrenia Research Institute
Clinical Liaison Officer

Dr Paul Tooney
University of Newcastle

Ms Melissa Tooney
ASRB Technical Officer

Dr Thomas Weickert
Prince of Wales Medical
Research Institute

Ms Rebecca Wilson
ASRB Clinical Assessment Officer
(until 1 March 2009)

Affiliated Scientists and Other Employees

Ms Joanne Allen
University of Newcastle
(until 4 February 2009)

Ms Retta Andresen
University of Wollongong
(until 18 July 2008)

Ms Lisa Azizi
University of Sydney

Ms Julie Barlow
Schizophrenia Research Institute
Finance and Administration Coordinator

Ms Alison Beck
University of Newcastle (from 18 July)

Ms Natalie Beveridge
University of Newcastle

Ms Aurelie Boucher
University of Sydney
(until 1 December 2008)

Dr Michael Breakspear
University of New South Wales

Dr Bill Budd
University of Newcastle

Mr Adam Carroll
University of Newcastle

Professor Stan Catts
University of Queensland

Ms Helen Connealy
Schizophrenia Research Institute
Partnerships Director

Ms Amy Dawson
University of Newcastle

Ms Teresa Du Bois
University of Newcastle
(until 15 May 2009)

Ms Carlotta Duncan
University of New South Wales
(until 2 December 2008)

Ms Kristy Dunlop
Prince of Wales Medical Research
Institute (from 1 October 2008)

Mr Stuart Fillman
University of New South Wales
(until 9 June 2009)

Dr Allison Fox
University of Western Australia

Dr Ross Fulham
University of Newcastle

Ms Erin Gardiner
University of Newcastle

Ms Susan Gordon
University of Wollongong
(until 31 July 2008)

Ms Mary-Claire Hanlon
University of Newcastle

Associate Professor Frans Henskens
University of Newcastle

Dr Deborah Hodgson
University of Newcastle

Ms Janette Howell
Schizophrenia Research Institute
Clerical Assistant

Mr Matthew Hughes
University of Newcastle

Mr Takeshi Iwazaki
University of Sydney

Ms Sharna Jamadar
University of Newcastle

Dr Linda Kader
Sunshine Hospital

Dr Luba Kalaydjieva
University of Western Australia

Dr Nishantha Kumarasinghe
University of Newcastle

Ms Natasha Matthews
University of Newcastle
(until 4 April 2009)

Associate Professor Skye McDonald
University of New South Wales

Ms Sharon Monterrubio
University of Wollongong

Associate Professor Vera Morgan
University of Western Australia

Professor Bryan Mowry
Queensland Centre for Mental
Health Research

Dr Penny Newson
University of Newcastle

Mr Thai Vinh Nguyen
University of Newcastle
(until 1 December 2008)

Ms Sharne Nicholls
Schizophrenia Research Institute
Executive Officer

Ms Rajesh Pathy
University of Wollongong
(from 5 January 2009)

Ms Yael Perry
University of New South Wales

Ms Naomi Piyaratna
University of Wollongong
(until 1 December 2008)

Ms Michelle Poole
Schizophrenia Research Institute
Clerical Assistant

Ms Colleen Respondek
University of Wollongong

Ms Dominique Rich
University of Newcastle
(from 1 February 2009)

Ms Amy Richards
University of Newcastle

Ms Debora Rothmond
Prince of Wales Medical
Research Institute

Ms Alice Rothwell
Prince of Wales Medical
Research Institute

Ms Jacqueline Rushby
Prince of Wales Medical
Research Institute

Mr Sai Ruthirakumar
University of Wollongong
(until 1 December 2008)

Ms Danielle Santarelli
University of Newcastle

Dr Maria Sarris
University of New South Wales

Mr Duncan Sinclair
University of New South Wales

Ms Kelly Skilbeck
University of Sydney
(until 13 May 2009)

Ms Ketrina Sly
University of Newcastle
(from 16 March 2009)

Dr Janette Smith
University of Newcastle

Ms Peta Snikeris
University of Wollongong
(from 5 January 2009)

Mr Yash Tiwari
Prince of Wales Medical
Research Institute

Dr Juanita Todd
University of Newcastle

Ms Shan Tsai
Prince of Wales Medical
Research Institute

Mr Alan Tunbridge
Schizophrenia Research Institute
Communications Director

Ms Diana Turner
Prince of Wales Medical
Research Institute

Ms Kristen Vallender
University of Newcastle
(from 1 February 2009)

Ms Katrina Weston Green
University of Wollongong

Mr Yang Yang
University of New South Wales
(from 16 January 2009)

Schizophrenia Research Institute - Supported Publications

Badcock JC, Chhabra S, Maybery M, Paulik G. Context binding and hallucination predisposition, *Personality and Individual Differences* 2008; 45: 822-827.

Bailey P, Henry J, Reed E. Schizophrenia and the display of embarrassment. *Journal of Clinical and Experimental Neuropsychology* 2009; 31: 545-552.

Chong V, Webster M, Shannon Weickert C. Specific developmental reductions in subventricular zone ErbB1 and ErbB4 mRNA in the human brain. *International Journal of Developmental Neuroscience* 2008; 26: 791-803.

Dalton VS, Wang HQ, Zavitsanou K. HU210-induced downregulation in cannabinoid CB1 receptor binding strongly correlates with body weight loss in the adult rat. *Neurochemical Research* 2009; 34: 1343-53.

Dedova I, Harding A, Sheedy D, Garrick T, Harper C. The importance of brain banks for molecular neuropathological research: The New South Wales Tissue Resource Centre experience. *International Journal of Molecular Sciences* 2009; 10: 366-384.

du Bois T, Deng C, Han M, Newell KA, Huang XF. Excitatory and inhibitory neurotransmission is chronically altered following perinatal NMDA receptor blockade. *European Neuropsychopharmacology* 2009; 19: 256-265.

du Bois T, Huang XF, Hsu CW, Li Y, Han M, Tan YY, Deng C. Altered dopamine receptor and transporter binding and tyrosine hydroxylase mRNA expression following perinatal NMDA receptor antagonism. *Neurochemical Research* 2008; 33: 1224-1231.

du Bois T, Newel KA, Han M, Deng C, Huang XF. Perinatal PCP treatment alters the developmental expression of prefrontal and hippocampal muscarinic receptors. *Progress in Neuropsychopharmacology & Biological Psychiatry* 2009; 33: 37-40.

Duffy L, Cappas E, Scimone A, Schofield P, Karl T. Behavioural profile of a heterozygous mutant mouse model for EGF-like domain neuregulin 1. *Behavioral Neuroscience* 2008; 122: 748-759.

Duncan C, Chetcuti A, Schofield P. Gene expression co-regulated by treatment with clozapine, haloperidol or olanzapine in the mouse brain. *Psychiatric Genetics* 2008; 18: 226-239.

Green A, Garrick T, Sheedy D, Blake H, Shores A, Harper C. Repeatable Battery for the Assessment of Neuropsychological Status (RBANS): Preliminary Australian normative data. *Australian Journal of Psychology* 2008; 60: 72-9.

Green M. Physiological mechanisms of schizophrenia phenotypes: genes and receptors (pp. 298-299). In Abubaker, R. et al., Summary of the 1st Schizophrenia International Research Society Conference oral sessions, Venice, Italy, June 21-25, 2008: The rapporteur reports. *Schizophrenia Research* 2008; 105: 289-383.

Hanlon MC, Karayanidis F, Schall U. Intact sensorimotor gating in adult attention deficit hyperactivity disorder. *International Journal of Neuropsychopharmacology* 2009; 12: 701-707.

Harris LW, Lockstone HE, Khaitovich P, Shannon Weickert C, Webster MJ, Bahn S. Gene expression in the prefrontal cortex during adolescence: implications for the onset of schizophrenia. *BMC Medical Genomics* 2009; 2: 28.

Hinton T, Johnston G. The role of GABAA receptors in schizophrenia. *Cellscience Reviews* 2008; 5: 1742-8130.

Karl T, Duffy L, Herzog H. Behavioural profile of a new mouse model for NPY deficiency. *European Journal of Neuroscience* 2008; 28: 173-180.

Kay-Lambkin F, Baker A, Lewin T, Carr V. Computer-based psychological treatment for comorbid depression and problematic alcohol and/or cannabis use: a randomized controlled trial of clinical efficacy. *Addiction* 2009; 104: 378-388.

Kim S, Wong J, Shannon Weickert C, Garner B. Apolipoprotein-D expression is increased during development and maturation of the human prefrontal cortex. *Journal of Neurochemistry* 2009; 109: 1053-66.

Lai A, Cairns M, Tran N, Zhang HP, Cullen L, Arndt G. RNA modulators of complex phenotypes in mammalian cells. *PLoS ONE* 2009; 4: e4758.

Langdon R, Jones SR, Connaughton E, Fernyhough C. The phenomenology of inner speech: Comparison of schizophrenia patients with auditory verbal hallucinations and healthy controls. *Psychological Medicine* 2009; 39: 655-663.

Law AJ, Pei Q, Walker M, Gordon-Andrews H, Shannon Weickert C, Feldon J, Pryce CR, Harrison PJ. Early parental deprivation in the marmoset monkey produces long-term changes in hippocampal expression of genes involved in synaptic plasticity and implicated in mood disorder. *Neuropsychopharmacology* 2009; 34: 1381-1394.

Michie PT, Budd TW, Fulham WR, Hughes ME, Jamadar S, Johnston P, Karayanidis F, Matthews N, Rasser PE, Schall U, Thompson PM, Todd J , Ward PB, Yabe H. The potential for new understandings of normal and abnormal cognition by integration of neuroimaging and behavioral data: Not an exercise in bringing coals to Newcastle. *Brain Imaging and Behavior* 2008; 2: 318-326.

Montague D, Shannon Weickert C, Tomaskovic-Crook E, Rothmond DA, Kleinman JE, Rubinow DR. Oestrogen receptor alpha localisation in the prefrontal cortex of three mammalian species. *Journal of Neuroendocrinology* 2008; 20: 893-903.

Morris R, Shannon-Weickert C, Loughland C. Emotional face processing in schizophrenia. *Current Opinion in Psychiatry* 2009; 22: 140-146.

Nesvaderani M, Matsumoto I, Sivagnanasundaram S. Anterior hippocampus in schizophrenia pathogenesis: molecular evidence from a proteome study. *Australian and New Zealand Journal of Psychiatry* 2009; 43: 310-322.

Pievani M, Rasser P, Galluzzi S, Benussi L, Ghidoni R, Sabattoli F, Bonetti M, Binetti G, Thompson P, Frisoni GB. Mapping the effect of APOE 4 on grey matter loss in Alzheimers disease in vivo. *NeuroImage* 2009; 45: 1090-1098.

Richards AB, Morris RW, Ward S, Schimz S, Rothmond DA, Noble P, Woodward R, Winslow J, and Shannon Weickert, C. Gonadectony negatively impacts social behaviour in adolescent primates. *Hormones & Behavior* 2009; 56: 140-148.

Rossell S, Batty R. Elucidating semantic disorganisation from a word comprehension task: Do patients with schizophrenia and bipolar disorder show differential processing of nouns, verbs and adjectives? *Schizophrenia Research* 2008; 102: 6368.

Rubinov M, Knock S, Stam C, Michelaynnis S, Harris A, Williams L, Breakspear M. Small-world properties of nonlinear brain activity in schizophrenia. *Human Brain Mapping* 2009; 30: 403-416.

Russell T, Green M, Simpson I, Coltheart M. Remediation of facial emotion perception in schizophrenia: Concomitant changes in visual attention. *Schizophrenia Research* 2008; 103: 248-256.

Schall U. Consciousness and hallucinations in schizophrenia: secondary aspects of generalized neuropil pathology? (Letter). *Australian and New Zealand Journal of Psychiatry* 2009; 43: 393-394.

Schall U. Dual constraints on synapse formation and regression in schizophrenia - More evidence required (Letter). *Australian and New Zealand Journal of Psychiatry* 2008; 42: 1069-1070.

Shannon Weickert C, Elashoff M, Bahn S, Paabo S, Khaitchovitch P, Webster MJ. Transcriptome analysis of male-female differences in prefrontal cortical development (Letter). *Molecular Psychiatry* 2009; 14: 558-61.

Shannon Weickert C, Miranda-Angulo AL, Wong J, Perlman WR, Ward S, Radhakrishna V, Straub RE, Weinberger DR, Kleinman JE. Variants in the estrogen receptor alpha gene and its mRNA contribute to risk for schizophrenia. *Human Molecular Genetics* 2008; 17: 2293-2309.

Sheedy D, Garrick T, Dedova I, Hunt C, Miller R, Sundqvist N, Harper C. An Australian Brain Bank: a critical investment with a high return. *Cell Tissue Banking* 2008; 9: 205-216.

Sly K, Lewin T, Carr V, Conrad A, Cohen M, Tirupati S, Ward P, Coombs T. Measuring observed mental state in acute psychiatric inpatients. *Social Psychiatry and Psychiatric Epidemiology* 2009; 44: 151-161.

Somel S, Franz H, Yan Z, Lorenc A, Guo S, Giger T, Kelso J, Nickel B, Dannemann M, Bahn S, Webster M, Shannon Weickert C, Lachmann M, Paabo S, Khaitovich P. Transcriptional neoteny in the human brain. *Proceedings of the National Academy of Sciences* 2009; 106: 5743-5748.

Weickert T, Carr V, Weickert CS. Second generation antipsychotics reduce treatment discontinuation rates compared with haloperidol (Comment). *Evidence Based Mental Health* 2008; 11: 115.

Weidenhofer J, Scott R, Tooney P. Investigation of dysregulated cytomatrix active zone gene expression in the amygdala in schizophrenia: Effects of antipsychotic drugs. *Journal of Psychiatric Research* 2009; 43: 282-90.

Weston-Green KL, Huang XF, Han M, Deng C. The effects of antipsychotics on the density of cannabinoid receptors in the dorsal vagal complex of rats: Implications for olanzapine-induced weight gain. *International Journal of Neuropsychopharmocology* 2008; 11: 827-835.

Wong J, Webster MJ, Cassano H, Shannon Weickert C. Changes in alternate brain-derived neurotrophic factor transcript expression in the developing human prefrontal cortex. *European Journal of Neuroscience* 2009; 29: 1311-1322.

Wye P, Bowman J, Wiggers J, Baker A, Knight J, Carr V, Terry M, Clancy R. Smoking restrictions and treatment for smoking: Policies and procedures in psychiatric inpatient units in Australia. *Psychiatric Services* 2009; 60: 100-7.

Zavitsanou K, Nguyen V, Newell K, Ballantyne P, Huang XF. Rapid cortico-limbic alterations in AMPA receptor densities after administration of PCP: Implications for schizophrenia. *Journal of Chemical Neuroanatomy* 2008; 36: 71-76.

Zhang X, Cairns M, Rose B, OBrien C, Shannon K, Clark K Gamble J, Tran N. Alterations in miRNA processing and expression in pleomorphic adenomas of the salivary gland. *International Journal of Cancer* 2009; 124: 2855-2863.

Research Grants

Administered by Schizophrenia Research Institute

Carr V, Draganic D. Identification of schizophrenia risk factors in Australian children. Janssen-Cilag, 2009 ($35,000).

Carr V, Michie P, Scott R, Schall U, Henskens F. Australian Schizophrenia Research Bank - Web Interface and Tools (ASRB). Intersect, 2009 (in kind support for IT developers to the value of $600,000).

Carr V, Schall U, Scott R, Jablensky A, Mowry B, Michie P, Catts S, Henskens F, Pantelis C, Loughland C, Tooney P. Revco Plus -86 Elite Upright Freezer. NHMRC Equipment Grant, 2008 ($3,356).

Catts S, Carr V, Loughland C, Draganic D. Australian Schizophrenia Research Bank Queensland. Sylvia and Charles Viertel Foundation General Program Grant, 2009-2011 ($210,000).

Draganic D, Carr V. Schizophrenia Research Institute and ANSTO Postdoctoral Fellowship in Schizophrenia Research. ANSTO, 2009-2012 ($134,363).

Karl T, Arnold J, McGregor I, Huang XF. Sensor rings (infrared beams) for open field apparatus (TruScan Coulbourn Instruments). NHMRC Equipment Grant, 2008 ($2,800).

Karl T. International Congress on Schizophrenia Research, San Diego 2009, CASS Foundation Travel Grant 2008 ($3,094).

Karl T. International Congress on Schizophrenia Research, San Diego 2009. Ian Potter Foundation Travel Award, 2009 ($2,500).

Miller D, Karl T. Does genetic predisposition to schizophrenia alter the susceptibility to drugs of abuse in an animal model for this mental disorder? The Royal Australian and New Zealand College of Psychiatrists Young Investigator Grant, 2008 ($3,000).

Administered by Host Institution

Arnold J. Role of ABC transporter in resistance to antipsychotic therapy and cannabinoid-antipsychotic drug interactions. NARSAD Young Investigator Award, 2009-2010 ($79,239).

Cairns M. Neurodevelopmental model of schizophrenia-associated changes in gene silencing. NARSAD Young Investigator Award, 2009-2010 ($83,489).

Carr V, Michie P, Karayanidis F and Holbrook A. Longitudinal Child Health Study: Stage 1 Pilot Study. University of Newcastle Data Linkage Credits, 2009 ($11,700).

Catts V. FAS-cinating changes in a death receptor pathway in schizophrenia. Stanley Medical Research Institute Neuropathology Research Grant, 2009-2010 ($190,823).

Frank E, Huang XF, Newell K, Deng C, Han M. Monitoring drug-induced changes of neurotransmission in vivo a microdialysis approach in an animal model of schizophrenia. Clive and Vera Ramaciotti Foundation Establishment Grant, 2009 ($30,000).

Frank E. Evaluation of mGlu2/3 as a novel drug target in a genetic animal model for schizophrenia. University of Wollongong Research Committee Small Grant, 2008 ($13,407).

Fung S. International Brain Research Organization International Travel Grant, 2009 ($2,180)

Harper C. Brain Tissue Resource Center for Alcohol Research. National Institutes of Health, National Institute on Alcohol Abuse and Alcoholism Grant, 2008-2012 ($2,495,279)

Huang XF, Deng C. The role of histamine, NYP and melanocortin systems in the development and prevention of olanzapine-induced obesity. University Research Council Near Miss Grant, University of Wollongong, 2009 ($15,000).

Huang XF, Newell K. NMDA receptor/ neuregulin1 signalling in response to phencyclidine administration, NHMRC Project Grant, 2009-2011 ($417,750).

Huang XF. Dedicated radioactive laboratory equipment, NHMRC Equipment Grant, 2008 ($5,480).

Karl T. How genetic and environmental risk factors interactively impact on animal models for schizophrenia. NHMRC Career Development Award, 2009-2012 ($370,000).

Karl T. The role of cannabis in animals genetically predisposed to schizophrenia. NARSAD Young Investigator Award, 2009-2010 ($83,484).

McCabe K. Faculty of Health Grant-in-Aid, University of Newcastle, 2009 ($5,000).

Schall U, Michie P, Stain H, Ward P, Langdon R, Todd J, Rasser P, Carr V, Weickert T. Understanding emerging severe mental illness in young people. NHMRC Project Grant, 2009-2013 ($1,505,750).

Shannon Weickert, C. Abnormalities of the human glucocorticoid receptor in schizophrenia and bipolar disorder. Stanley Medical Research Institute Neuropathology Research Grant, 2009-2010 ($156,760)

Walker R, Dayas C, Spratt N, Tooney P. An XYZ motorised microscope stage for use in a setup to perform advanced neuron reconstruction, 3D mapping of neuronal structures and morphometry analysis. Hunter Medical Research Institute PRC CBMHR Infrastructure funding, 2009 ($10,000).

Weickert T, Weickert CS, Schofield P, Kulkarni J, Carr V. Cognitive enhancement in schizophrenia via selective oestrogen receptor modulator. NHMRC Project Grant, 2009-2011 ($381,150).

Wong J. Molecular mechanisms leading to schizophrenia - the role of estrogen and estrogen receptor alpha. NHMRC Training Fellowship, 2009-2012 ($285,000).

If your brother has schizophrenia, your children are four times more likely to develop the illness.

Research Students and Awards

Schizophrenia Research Institute Supported Degrees

Schizophrenia Research Institute supported the following students who were awarded research higher degrees in 2008-2009.

PhD

Dr Retta Andresen,
University of Wollongong,
July 2008

Dr Aurelie Boucher,
University of Sydney,
December 2008

Dr Teresa Du Bois,
University of Wollongong,
May 2009

Dr Carlotta Duncan,
University of New South Wales,
October 2008

Dr Georgie Paulik,
University of Western Australia,
September 2008

Dr Natasha Matthews,
University of Newcastle,
April 2009

Dr Kelly Skillbeck,
University of Sydney,
May 2009

Honours

Ms Danielle Santarelli,
University of Newcastle,
December 2008

Ms Susan Gordon,
University of Wollongong,
July 2008

Mr Thai Vinh Nguyen,
University of Newcastle,
December 2008

Ms Naomi Piyaratna,
University of Wollongong,
December 2008

Mr Sai Ruthirakumar,
University of Wollongong,
December 2008

Early Career Researcher Award

Dr Elisabeth Frank,
University of Wollongong

Postgraduate Student Award

Dr Teresa du Bois,
University of Wollongong

Design and print management O'Kelly and Associates

Schizophrenia Research Institute
405 Liverpool St, Darlinghurst, NSW 2010, Australia
TELEPHONE: (02) 9295 8688 FACIMILE: (02) 9295 8689
EMAIL: contact@schizophreniaresearch.org.au
www.schizophreniaresearch.org.au