

HEADLINES

The Newsletter of the Neuroscience Institute of Schizophrenia and Allied Disorders. Sept. 2002.

The Genetics of Schizophrenia

NISAD mobilises Research Register volunteers and the new 'gene-chip' technology to crack the DNA code of schizophrenia.

Although over 90 per cent of schizophrenia cases arise in families with no medical history of mental illness, the genetic contribution to liability for the disease is well established. Whereas the risk in the general population stands at 1 per cent, the risk in a child with both parents affected is over 30 per cent, even when the child is brought up by adoptive parents.

GENETIC RISK of SCHIZOPHRENIA

Familial Relationship	Risk
Identical twin affected	50%
Fraternal twin affected	15%
Sibling affected	10%
One parent affected	15%
Both parents affected	35%
Second-degree relative affected	2%-3%
No affected relatives	1%
General population	1%

Source: Roberts, Leigh, & Weinberger (1993)

some 21, instead of the normal two. The source of Huntington disease has been mapped to chromosome 4, and to an abnormal repetition of the DNA coding for a specific protein. Scientists are also working to track the genetic causes of Parkinson and Alzheimer diseases, and some types of epilepsy.

The genetics of schizophrenia are proving more elusive. Previous studies of affected families have implicated no less than 13 chromosomes, and the current view is that the illness may be caused by small changes in a large number of genes. However, the new availability of micro-array or 'gene-chip'

"The key factor is that stress alone does not cause schizophrenia."

Prof. Philip Ward

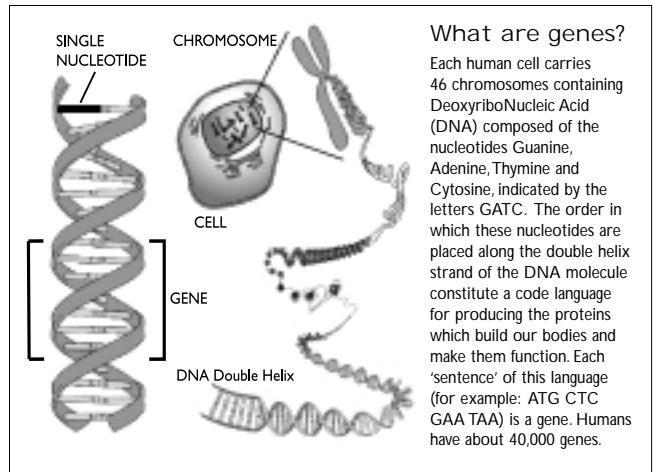
technology (introduced in 1999) promises to speed up the quest by allowing researchers to determine the expression of thousands of genes at the same time.

Another factor in the slow progress of genetic schizophrenia research to date has been the small numbers involved in each study. Comparing the DNA profiles of patients and their first-degree relatives could provide vital clues to the origins of the illness.

The DNA Bank for Schizophrenia Research

The concept of initiating a DNA bank for schizophrenia research arose from an original proposal by NISAD scientists Dr Paul Tooney and Dr Carmel Loughland, in association with Professors Vaughan Carr and Rodney Scott. The innovative project is now well underway, strongly supported by the Hunter Medical Research Institute, the University of Newcastle, and the Hunter Area Pathology Service.

Members of the NISAD Research Register will play a key role. Patients and their relatives will be invited to provide blood samples from which the DNA will be extracted. This will be especially valuable because Register members have already provided clinical details of their case histories, and many have participated in MRI studies in which brain scans have been obtained. Correlating such clinical and anatomical information with their genetic data may generate powerful new insights into schizophrenia.



New knowledge from new technology

The DNA Bank will provide a uniquely valuable resource for all researchers into the genetic components of schizophrenia. One such study already underway is being conducted by NISAD's Dr Paul Tooney with Prof. Rodney Scott, at the University of

Newcastle. Complementing and extending the results from the DNA micro-array analyses, the team will use SNP (Single Nucleotide Polymorphism) analysis methods to compare selected profiles from the DNA Bank. In this study, SNPs will be used to detect differences in the DNA sequences of schizophrenia subjects, bipolar subjects, and healthy controls.



NISAD's Dr Carmel Loughland and Dr Paul Tooney.

These stresses can be infection during pregnancy, obstetrical complications, direct brain injury, childhood emotional trauma, and many others. Wondering which of them caused the illness is still a source of much emotional distress in parents. But as NISAD Scientific Director Prof. Philip Ward says, the key factor is that stress alone does not cause schizophrenia.

Over the last few decades, research has discovered the genetic abnormalities responsible for many diseases. We now know, for example, that Down's syndrome is caused by the affected child having three copies of chromo-



NSW Health Minister Craig Knowles with Don McDonald at the NISAD Sponsors & Supporters Lunch.

Renewing a powerful partnership for mental health

NSW Health applauds and rewards the NISAD achievement.

Since October 2000 when Health Minister Craig Knowles initiated the NISAD/NSW Health Partnership Project, its Director Don McDonald has exceeded its targets of raising funds and public awareness for schizophrenia research.

Over 15,000 people have been reached via direct presentations, and ten times that number via media

coverage. Fundraising has been equally successful with over \$650,000 raised for NISAD via individual donations and 3-Year Sponsorships.

"I particularly appreciate the Partnership's program of workplace and public presentations that have increased the awareness and understanding of schizophrenia in our community", said Mr Knowles.

After reviewing progress to date, the Minister has advised that NSW Health support for the Partnership will be extended to December 2006.



New 3-Year Gold Sponsor Mrs Margaret Ainsworth accepts the plaque from Craig Knowles.

New Supporters Rally to the Cause at the Annual Sponsors Lunch

Held on 9 September, over 70 people attended the 2002 Annual Sponsors & Supporters Lunch held on the top floor of the ABN-AMRO building, and hosted by NISAD Board member Mike Shepherd of Challenger First Pacific.

Before the buffet lunch, guests saw a presentation by Paul Rasser of the latest images from his brain atasing project, and heard an overview of current research from Scientific Director Prof. Philip Ward.

Craig Knowles praised the Institute's energetic efforts in cutting-edge research, fundraising and public awareness, before presenting plaques and certificates to new sponsors and supporters.

Mike Shepherd commented that many people remarked on NISAD's rapid development into a world class research institute, and that such growth simply would not have happened without the strong public and corporate support represented by the lunch attendees.

A full list of 2002 sponsors and major supporters is featured on the back page of this issue.

Breakfast Point Funds Concord Research

Concord Hospital researchers use Gamma camera technology to pinpoint which parts of the brain are affected by schizophrenia, leading to better targeted treatment.

While developing the new Breakfast Point waterfront suburb between Mortlake and Cabarita, CBUS Superannuation and Rosecorp are also helping to build new knowledge of mental illness.

NISAD will spend the three-year \$75,000 sponsorship from the Breakfast Point Community Aid Fund on funding PhD student Mark Pearson to participate in ground breaking research at Concord Hospital's Department of Nuclear Medicine. Dr Hans van der Wall and his team will use radioactively labelled molecules and Gamma camera technology to map neurodevelopmental abnormalities in the brains of young people experiencing their first episodes



Dr Hans van der Wall and Prof. Philip Ward with research subject. Right: Typical Gamma camera images showing brain activity in lighter areas.

of schizophrenia. This will be the first time the technique has been used for this purpose.

NISAD Scientific Director Prof. Philip Ward said the research would increase our understanding of specific areas of the brain affected by the disease, and could lead to better targeting of treatments.

"Current treatments can be associated with serious side effects and we do not have a clear basis for predicting which medication will be most effective for an individual patient," he said.

Patients involved in the study will be sourced from NISAD's unique Schizophrenia Research Register which lists around 800 volunteers.

Telstra helps open new 'Pathways to Care'



Most HeadLines readers will be all too familiar with the confusion and distress the onset of schizophrenia causes in the family. Despite the improvements in medications and public awareness achieved over the past decade, little has been done to alert parents and family doctors about the teenage 'danger zone' when symptoms often emerge. Subsequently diagnosis and treatment are often delayed by as much as two years after onset. Case histories often tragically reveal that it is in this gap between onset and diagnosis that permanent damage is done:

employment and educational opportunities are lost, family relationships damaged, behavioural problems and drug abuse become entrenched.

All Area Health Services in NSW offer early intervention programs to provide specialist support for young people experiencing their first episode. The psychological and medical treatments offered have been shown to improve long-term outcomes and reduce risk of suicide. However, only a minority of cases are being referred, and thousands of teenagers are still receiving treatment too little and too late.

With a \$40,000 grant from the Telstra Foundation, NISAD will undertake a study of the 'pathways to care' connecting the community with the help offered by several NSW early intervention programs. The aim is to research and compare numbers and sources of referrals (e.g from GPs, school counsellors, police) to each centre, to interview key contacts made during the referral process, and to identify ways of improving awareness and skills in potential referrers, so that more young people at risk receive the timely help they so urgently need.

Donna Launches the SeaQuest Epic

Donna Edye will paddle from Cooktown to Wollongong to help mental health.

On 27 October, Donna Edye will launch her kayak from the coast of Cooktown and start paddling towards Wollongong, 4,000 km away. This epic voyage will be undertaken to raise public awareness of mental illness, and funds for research into schizophrenia and bipolar. As one of the beneficiaries, NISAD warmly congratulates Donna,

and plans to put its share of the targeted fundraising total of \$1.5M to good use.

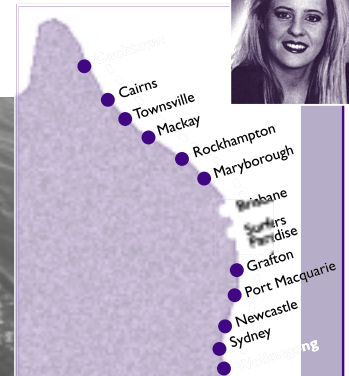
Braving high seas and possible sharks, Donna will paddle from far north Queensland, averaging 50 km per day, and calling in for overnight stops in communities where fundraising dinners and other events will be held.

Further support and awareness will be gained enroute from press articles, magazine features, radio interviews, and TV appearances.

No nationwide public awareness

campaign of this type and scale has ever been launched on behalf of mental illness awareness and research.

The number of sponsors already signed up indicates that Donna's voyage will certainly capture the public imagination. So please look out for media coverage, and visit the website at www.deko.org.au



Left: Donna gets in some training in her kayak. Above: The daunting sea route awaiting the intrepid fundraiser.

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top quality wine
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At this price,
it's a great way to
help NISAD!

See enclosed colour leaflet.



Fellow Directors surprised Peter Dempsey (left) with a plaque award at the August Board meeting.

Construction Leaders Build ANOTHER Big Donation

Not content with masterminding the biggest ever NISAD fundraising event (last year's M5 Tunnel Dinner), Peter Dempsey, CEO of Baulderstone Hornibrook, has followed up by organising a 'Construction Industry Leaders Lunch' as further support for the Institute.

On 19 August, Chief Executives of major construction companies gathered to hear NSW Minister for Health Craig Knowles speak highly of NISAD's progress; Prof. Philip Ward explain the latest research, and Don McDonald describe the illness from a carer's perspective.

Attendees were Ray Horsburgh, MD & CEO Smorgon Steet Group, Peter Campbell, MD, Clarendon Homes, Russell Perkins, MD, Walter Construction Group, Tony Chamberlain, MD, Chubb Fire Australia, Lindsay Partridge, MD, Brickworks and Peter Brecht, MD, Abi Group.

In their different ways, guests expressed thanks to the speakers for providing insight into an underexposed issue, and into the urgent need to combat the devastation schizophrenia continues to cause in every generation. Each has pledged to raise the issue of NISAD sponsorship with their Boards.

If any HeadLines readers are in a position to organise similar lunches, please call Don McDonald on (02) 9295 8396.



'Flo-Jo' runs up a \$900 donation!

In the field of 1200 runners in the Sydney Marathon, Joanne Roberts came in a highly commendable 464th, thereby donating \$918 to NISAD via the generosity of her sponsors.

Joanne ran the 42km course in 3hrs 46mins, despite fearing that headline stress fractures sustained in training would force her to miss the start. She says she enjoyed the experience, but has no plans to do it again.

Many thanks from NISAD, Joanne!

Visual Scan Path Research Generates New Looks at Schizophrenia

Enabling these dynamic research collaborations is what NISAD is all about.

Congratulations to NISAD's Dr Carmel Loughland on not only achieving her Doctorate, but also helping to win substantial funding to continue her research.

Following the successful submission of her PhD thesis*, Carmel has received grants from the University of Newcastle and the Hunter Medical Research Institute to purchase state-of-the-art Viewpoint eye tracking equipment. This will enable her to extend her groundbreaking research into eye movement abnormalities in schizophrenia subjects and first-degree relatives.

In her new research, Carmel's subjects will scan digitized and animated faces changing from one expression to another, instead of static photographs.

This Newcastle-based research promises to show how scan path abnormalities are affected by the naturally changing emotional content of viewed faces in real life.

■ Scan paths in delusions

Wearing her other hat of NISAD's Research Register Coordinator, Dr Carmel Loughland has provided Dr Melissa Green with volunteers for her University of Sydney study of how visual/emotional information processing deficits contribute to the formation of delusions in schizophrenia.

Using scan paths, Melissa showed that when healthy subjects saw an image of a threatening face, their visual focus on individual features increased. In contrast, clinically deluded subjects shown the same image avoided looking at individual features.

Melissa's research was the first to include delusion-prone subjects (i.e. healthy people with delusion-like ideas that predispose them to developing delusional beliefs), and to show similarities in eye movement abnormalities. Also, clinically deluded and delusion-prone subjects were slower to



Top: Typical differences between scan paths of schizophrenia subject (L) and normal control (R). Middle: Eye tracking equipment in use. Above: Dr Carmel Loughland (L) and Dr Melissa Green (R).

recognise angry faces, indicating that they were having to *think about* the emotional interpretation, instead of recognising it instantly.

Both Carmel's and Melissa's studies were supervised by Dr Leanne Williams, whose related research was featured in HeadLines in January 2001.

■ Future collaborations

Other NISAD scientists are also using scan path techniques to investigate abnormal eye movements in schizophrenia. NISAD looks forward to the future collaboration of these scientists in studies combining and expanding their visual scan path findings.

*CM Loughland, LM Williams, AW Harris: Visual scan path disfunction in first-degree relatives of schizophrenia probands.

NSW CLUBS SWING INTO FUNDRAISING BY GOLF!

On 25 September, the Camden Valley Golf Resort was the venue for the inaugural NSW Clubs Four Ball Invitational Golf Championship, raising over \$16,000 for NISAD.

The organisers were Ken Hurst of Clubs NSW; Terry Condon of Club Managers Assoc.; David Costello of Leagues Clubs Assoc., and Graham Carroll of Service Clubs Assoc.

100 players participated, and the Camden Valley home team of David Cahill, Michael Johnson, Doug Jones and Rod Wishart won the trophy.

Having confirmed its fundraising effectiveness, the organisers have established the Championship as an annual event.

If other golfing HeadLines readers would like to ask about setting up their own club's annual Championship, please contact NISAD.



Organisers of the Championship. L-R: Ken Hurst of Clubs NSW; Terry Condon of Club Managers Assoc.; David Costello of Leagues Clubs Assoc.; Graham Carroll of Service Clubs Assoc.



L-R: Don McDonald with cup winning team David Cahill, Michael Johnson, Doug Jones. The 4th team member (not featured) was Rod Wishart.

Comings and Goings



Ana Lopes



Gen Hemsley-Wilken

NISAD was very sorry to see Office Manager Ana Lopes move on. She had been the calm centre of the Institute's whirlwind of activities over the past two years, and had won the respect and affection of scientists, supporters and central office staff alike.

Ana was presented with an 'In Recognition' plaque as a token of the Institute's gratitude and esteem.

Genevieve ('Gen') Hemsley-Wilken has joined the team to provide on site expertise in managing the payroll, tax, and general accounts for NISAD's expanding financial affairs.

What is a Delusion?

A new collaborative research initiative investigates.

While most people are familiar with the dramatic character of the 'paranoid schizophrenic' so often written into movie scripts, very little is actually known about why and how delusions appear in the mind.

Delusions are first-rank indicators of schizophrenia, and many parents report that it was only when their son or daughter started talking about being spied on by the Government, controlled by angels, or visited by space travellers that they realised their child actually was mentally ill.

NISAD's Prof. Philip Ward, and Prof. Max Coltheart of the Macquarie Centre for Cognitive Science have received a \$20,000 grant from the Health Research Foundation Sydney South West to start their collaborative project entitled "A

neuropsychological investigation of primary and secondary delusions."

Research in this field has hitherto focused on secondary delusions (those caused by physical brain injury or epilepsy and related illnesses), and this new study will be the first to investigate how delusions may arise from specific malfunctions in the brain's information processing systems.

Making extensive use of interviews and questionnaires, and involving 48 subjects, the 12 month project will be based at the Schizophrenia Research Unit, Liverpool Hospital - home of NISAD's brain atasing activities.

Liverpool Hospital has recently installed a state-of-the-art PET camera, and MRI scanner enabling the project to include brain imaging.



Patron: Her Excellency, Professor Marie Bashir AO, Governor of NSW

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Sponsors being sought

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3-YEAR BRONZE SPONSORS

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MAJOR SUPPORTERS 2002

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- Consolidated Constructions
- Imomentum Recruitment
- John Holland Group
- Joy Mining Machinery & Employees
- Lions Club of Kiama
- Madeira Formwork
- Mineworkers Trust
- The Perpetual Foundation
- Pittwater R.S.L. Club
- Planet Fix
- Porter Novelli
- The Ronald Geoffrey Arnott Foundation
- Rotary Club of Albion Park
- Rotary Club of Bulli
- Rotary Club of Engadine
- Rotary Club of N.Sydney Benevolent Fund
- Schizophrenia Fellowship of Wollongong
- South Sydney Junior Rugby League Club
- Street Vision (Ambient Advertising)
- Telstra Foundation
- Total Electrical Connection
- Tyrrell's Wines
- Wideform Constructions

NISAD IS FUNDED BY NSW HEALTH

Raise SMILES of Funds for NISAD!

Want to help raise much-needed funds for NISAD but not sure what you can do? Here's some thought-starters for some fun, topical events you can organise in your workplace, local community or among your friends and family to encourage donations to NISAD. Why not ask participants to generously donate a gold coin or larger amount to NISAD?

Clear out your unwanted household items by holding a Garage Sale	Spring	October
Tantalise your taste buds with a progressive dinner party moving from restaurant to restaurant or home to home	Sydney Morning Herald Good Food Month	October
Host a Trick or Treat themed party	Halloween	31 October
Wear a fabulous hat	Melbourne Cup	5 November
Spare a thought Christmas dinner	Yuletide	December
Hold a Brain Game trivia night		Anytime

Give As You Earn

As part of their commitment to social responsibility, many companies now run "Give As You Earn" philanthropic programs with employees able to donate to their chosen charities through payroll deductions. In many cases these are then matched by their employer, doubling the size of the donation to charity.

If your company has such a program, why not ensure NISAD is one of the selected beneficiaries, or tell your colleagues about us so they too can nominate NISAD if they wish.

And if your company has yet to get a Give As You Earn program underway, why not suggest it?

For more information, contact Jackie Crossman on (02) 9295 8397, or email j.crossman@nisad.org.au

Hear the latest in research from the researchers themselves

Come to the Public Forum of the Australasian Schizophrenia Conference at Bondi!

As part of the 2002 Australasian Schizophrenia Conference, a free Public Forum will be held at the Swiss-Grand Hotel, Bondi Beach.

People with schizophrenia and carers are especially invited to come and hear about the latest research, ask questions, and participate in the symposium-style discussion of schizophrenia issues.

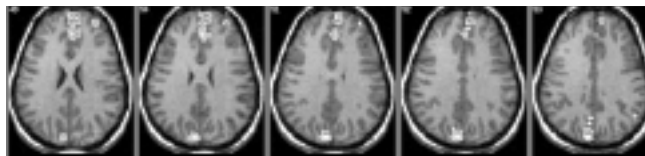
The Forum offers a rare chance to hear eminent scientists from the UK,

USA and Australia talk about the possible implications of their discoveries on treatments and services. Also, current issues will be discussed, such as "Should carers and consumers have a say in treatment planning?"

Co-hosted by the Schizophrenia Fellowship of NSW, and in cooperation with Mental Illness Fellowships Australia, the Forum will run from 6.30pm to - 8.30pm, Thursday 24 October.

To register for the Forum or for the Conference itself, please call **Jonine Penrose-Wall on 0409 315823**, or visit the Conference Website at www.ausc.info

Investigating Bipolar Disorder to Improve Diagnosis



Above: Healthy control subjects react to seeing one of a series of captioned images (right).

The 5-picture fMRI sequence above shows a single reaction scanned at 5 levels of the brain, and indicates vigorous activity at the front and back of the brain.



Below: Bipolar depressed subjects viewing the same image show far less activity at the front of the brain, and none whatsoever at the back.

Note: Each set of 5 images is a composite of scans made of all bipolar or control subjects viewing the captioned image.



Many parents have suffered confusion and distress when they have learned that one health professional has used the diagnostic label 'schizophrenia' for their son or daughter, while another has diagnosed the same person as having bipolar disorder ('manic depression').

This is one of the reasons why NISAD includes 'allied disorders' in its title. The borderlines between some severe mental illnesses are still undefined, and research is particularly needed to improve the differentiation between schizophrenia and bipolar disorder, two of the most severe and common conditions.

In a collaborative study* involving scientists from the Black Dog Institute and collaborators in the UK, fMRI brain scans were obtained from bipolar patients and healthy controls while they viewed a series of captioned pictures. Some pictures and captions were designed to evoke an emotional response, others to evoke no emotional response. Differences in brain activation (as shown above) were observed, with bipolar subjects recording lower

levels of activity in the frontal lobes, and a significant absence of activity in the occipital lobes at the back of the brain.

These results parallel earlier studies involving unipolar depressed subjects (clinical depression), and indicate a diminished ability to modulate affect, perhaps reflecting reduced emotional reactivity.

While scientists must necessarily report such findings in cautious, unemotional terms, patients with bipolar depression may well say that the absence of the little white dots at the bottom of the lower set of scans indicates the absence of pleasure in being alive.

The results from this collaborative study may be a first step towards developing better diagnostic tools for bipolar disorder, which will establish clearer differences between itself and schizophrenia.

NISAD scientists Dr. Jim Lagopoulos and Prof. Philip Ward participated in this study which utilised the St George Hospital MRI unit.

*Malhi G, Lagopoulos J, Ward PB, Ivanovski B, Kumari V, Mitchell PB, Parker GB, Teasdale JD, & Sachdev PS: fMRI of Cognitive Generation of Affect in Bipolar Depression.

Visit the NISAD Website at www.nisad.org.au

HeadLines is edited, designed and produced by NISAD Marketing Director Alan Tunbridge. The opinions expressed in HeadLines do not necessarily represent the views of all NISAD's participating scientists.

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