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SCHIZOPHRENIA RESEARCH INSTITUTE
PREVENTION, CURE.

July 2012

A new spotlight on brain research

Professor Ulli Schall remembers the moment when he realised the brain wasn't a 'meaningless black box'. He was a young undergraduate student studying psychology at a university in West Germany in the early 80s, when a lecturer with an interest in animal behaviour started him thinking about what goes on in the human brain.

That revelation steered Ulli into the unexplored world of how the brain thinks and eventually saw him appointed to be the first Chair of Schizophrenia Research in Cognitive Neuroscience in Australia. Professor Ulrich Schall was awarded the prestigious post at the University of Newcastle in partnership with the Schizophrenia Research Institute and funded by the NSW Government's Department of Trade and Investment.

"I'm very excited and honoured by the appointment because it gives me the opportunity to apply what we've learnt about brain function in relation to schizophrenia and to explore potential novel ways to prevent the onset of the illness," said Professor Schall.

Until now, Professor Schall has worked with other cognitive neuroscience researchers at the University of Newcastle but his appointment places him as a figurehead of the Institute's cognitive neuroscience research program and positions him with two other schizophrenia-focused research Chairs in Australia: the Macquarie Group Foundation Chair in Developmental Neurobiology held by Professor Cyndi Shannon Weickert and the Chair of Schizophrenia Epidemiology and Population Health held by Professor Vaughan Carr, CEO of the Schizophrenia Research Institute.

"This is a significant boost for our research program because it shines a spotlight on three important areas of scientific study that complement each other," said Professor Carr. (*What it means for people with schizophrenia* – CEO's Report, Page 2)

While cognitive science is the study of the mind, neuroscience looks at the brain and the nervous system. When the two disciplines are combined, cognitive neuroscience investigates the genetic, biological and physiological aspects of the brain, and how these relate to our thoughts, emotions, perceptions and behaviour. It is a relatively new area of scientific study, but as Professor Schall points out, it is opening up a better understanding of the brain processes that lie behind the thinking, perceptual and emotional responses in people with schizophrenia.

Professor Schall will build a centre of excellence in the area of cognitive neuroscience at the University of Newcastle with a team of researchers, but will also work with other scientists in a variety of areas as well as other researchers in the Schizophrenia Research Institute network across Australia.

The work will include a major study of the brain structure and function of young people at high risk of developing psychosis to try to discover ways to prevent the onset of schizophrenia.

As Ulli Schall begins one of the most important chapters in his research career, he can't help but reflect on how the words of a university lecturer some 20 years ago would have such a profound effect on his life and the lives of others.

Professor Schall took up his Chair position on 1 July 2012.

Inside Headlines

CEO's Report

Professor Vaughan Carr. CEO, Scientific Director

You've probably read the story on the front page of Headlines about the appointment of Professor Ulrich Schall as the new Chair of Cognitive Neuroscience at the University of Newcastle. It's an important appointment for people affected by schizophrenia because it'll strengthen our capacity to understand how the brain works in people living with schizophrenia and how we might learn to help them more effectively.

Cognitive neuroscience is the study of brain structure and function underpinning mental processes and behaviour. It's a field of research made possible by recent technical advances for studying the human brain in the laboratory.

Neuro-imaging (brain scans), electrophysiology (brain waves), and performance on special tests of speed and accuracy are used to provide insight into the brain networks involved in such things as attention, language, memory, problem-solving, even moral judgments and political disposition.

Newcastle has long had great strength in cognitive neuroscience research, both basic and applied. This was developed under the influence and leadership of Emeritus Professor Pat Michie, a former board member of the Schizophrenia Research Institute.

Within the Institute network, Newcastle has led research studies of brain structure-function relationships in the early stages of schizophrenia and brain wave anomalies at various stages of the illness. For these reasons, we at the Institute are delighted to welcome Professor Schall's appointment.

Professor Schall has a strong record of research achievement in cognitive neuroscience, including basic science studies of laboratory animals through to human research using novel brain imaging techniques in schizophrenia.

It's critical to the Institute's research effort that we develop strong leadership in cognitive neuroscience to complete the 'virtuous circle' of research between Cognitive Neuroscience and the existing Chairs in Developmental Neurobiology and Epidemiology.

Research Profile

Dr Juanita Todd
University of Newcastle

Research area:
Measuring the brain's response to sound

Educated:
University of Western Australia

Doctorate:
PhD/MPsych(Clinical) - 2001

Personal Interests:
Family, Ashtanga Yoga

For a person who spends a great deal of her time looking at squiggly lines on a computer, it's a surprise to hear Dr Juanita Todd describe research as a "beautiful thing."

But to this researcher who gave up clinical psychology to dedicate herself to research, the beauty in what she does lies in not knowing what she's going to find. It's all in the challenge, she says.

Even at school, Juanita was enticed by challenge; to discover what "my best" could be and keep following the path offering the greatest challenge. While her personal goal to keep pushing the barriers beyond what science knows today drove Juanita into taking up research, it was teenage problems with anxiety and depression that decided she should become a psychologist.

A clinical psychologist was a great help to her at that time. "I said to myself that if I could do for one person what she just did for me, my life would really mean something."

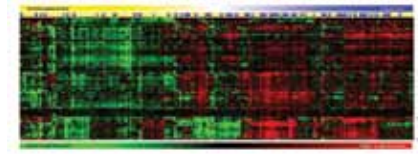
But why schizophrenia research? "As a psychologist, I was always fascinated by how the brain 'creates' our experience of the world," she replies. Juanita describes her work as a "journey, uncovering the right questions to ask in order to determine what aspects of brain function are altered and what are intact in schizophrenia."

Currently, she's studying automatic processes that filter the relevance of sound information around us. That's where the 'squiggly lines' on the computer screen come in – images of the first milliseconds of the brain processing information. This process ensures that people are able to ignore events that don't matter (e.g. sounds that our experience enables us to predict) and reserve resources for events that do matter (e.g. sounds that carry new information that might be important). "Elements of this process are impaired in schizophrenia and the goal of my research is to identify the nature of this impairment," said Juanita.

Her research has already revealed things science didn't know about how the brain functions and learns. That presents Dr Todd with another of the challenges she loves in schizophrenia research. She has to translate the results she's achieved and see how and why they fit into other areas of research in order to produce what she calls "a truly integrated understanding of this illness."

A blood test for schizophrenia?

It's not a matter of if, but when, says Dr Murray Cairns, that a blood test will detect whether a person is at risk of developing schizophrenia. And while much research remains to be done, he wouldn't be surprised if that day comes in the next 10 years or so.



Computer image - micro RNA cluster of Schizophrenia analysis

His glimpse of the future follows new research at the University of Newcastle into using blood rather than the brain to explore the causes of schizophrenia.

The researchers looked at a type of molecule, minute ribonucleic acid, (RNA) called micro RNA, which coordinates nervous system development and neuronal function in the brain. To investigate micro RNA activity, they tested the blood of 188 people, 112 of whom had schizophrenia.

Dr Cairns explains, "Blood contains the same genetic material found in the brain, just switched on in different ways. Traces of molecules, such as micro RNA, found elsewhere in the body, end up in the blood." The advantage of testing blood is that for researchers it's more accessible than the brain. "We can't see everything," says Dr Cairns, "but we see many of the things that matter."

The researchers identified micro RNA molecules in the blood that the team had previously found in the brains of those with schizophrenia. This suggests that patterns of micro RNA found in blood could be used to predict how these molecules act to regulate gene expression in the brain. Currently, the diagnosis of schizophrenia is based on clinical criteria, including the presence of symptoms over a defined period, rather than on the basis of causes, which are not well understood.

What the researchers discovered was a number of micro RNA biomarkers that have the potential to be used to develop a diagnostic kit for schizophrenia. "We're pursuing an exciting and promising area of research but a lot more work is still needed." Dr Cairns says the research at Newcastle University will continue because early intervention is crucial in improving the treatment and outcome of schizophrenia.

Your help is needed

Your help is needed to improve understanding of how schizophrenia and related disorders develop.

Researchers from the University of NSW are looking for volunteers to take part in a study that Dr Melissa Green says is critical to improving treatment of people with various forms of psychotic illness who have cognitive deficits, that is, characteristics that act as a barrier to thinking processes.

The 'Neurocognitive Markers of Affective and Psychotic Disorders', study aims to uncover associations between shared genetic vulnerability and brain dysfunction in schizophrenia and bipolar disorders, following new evidence that these conditions share some common genetic causes.

"We need to find out more about the problems associated with the common genetic contributions, regardless of what type of psychotic illness the person has," said Dr Green.

"If successful, medications could be developed to meet the needs of individuals according to which cognitive processes are impaired and might even be targeted toward individuals of a certain genotype." At present, there are no medications for cognitive deficits.

The researchers are seeking people who've already been diagnosed with bipolar disorder, schizophrenia or schizoaffective disorder, aged between 18 to 60 and proficient in English. You'll be interviewed about your life experiences, and will complete a series of questionnaires and tasks on a computer, undertake a magnetic resonance imaging (MRI) scan and donate blood and saliva. This study is contributing to the Australian Schizophrenia Research Bank collection.

For more information contact Dr Melissa Green on (02) 8382 1584 (melissa.green@unsw.edu.au) or the primary Research Officer, Mr Nick Vella, on (02) 8382 1436 (n.vella@unsw.edu.au).

Staying on medication

Taking medication for any illness is not always easy but many people taking antipsychotic medication for schizophrenia have great difficulty staying on their medication, despite the risk of a relapse.

Treatment adherence is a real problem but research shows that there are ways to help keep people on their medication and families can play a role, as Sandra Matheson, Research Officer at the Schizophrenia Research Institute explains.

Despite the benefits of medication, it's estimated that about 75 percent of people with schizophrenia will stop taking their medication within 18 months, which can increase the risk of illness relapse. Young people in the early stages of the disorder are the most vulnerable to the consequent return or a worsening of their symptoms on stopping medication. This increases the burden on people with schizophrenia, caregivers and families, community healthcare services, crisis teams and hospitals. It's also a financial burden, with figures based on United States findings showing that an estimated $1,392 million to $1,826 million is spent in one year alone, to re-hospitalise people who stop taking antipsychotic medication.

Prevention is the key to avoiding relapse. Recognising the problem early may offer the potential for early intervention in people who have stopped their medication. Evidence suggests that 70 percent of people with schizophrenia and 93 percent of family members can identify changes in experiences or behaviour, which may predict relapse. This is a brief opportunity to get in early, resume medication and avert relapse.

Common early warning signs of impending relapse include;

- onset or worsening of hallucinations
- suspiciousness
- change in sleep patterns
- anxiety
- problems thinking clearly
- hostility
- changed physical feelings or sensations
- delusions
- inappropriate behaviour
- depression.

The ability of people with schizophrenia to recognise or understand the changes they're experiencing may deteriorate as the symptoms progress and their insight into their condition diminishes.

So what can be done to prevent people from stopping medication in the first place? We increasingly hear the word 'psychosocial', which simply means a combination of social factors and individual thinking and behaviour. Psychosocial interventions can be used, which include behavioural therapies that focus on what medication is needed, its benefits and what it's aiming to achieve.

Other strategies include cognitive-based compliance therapy, psychotherapy, family interventions, education programs and telephone reminder calls.

Other factors associated with staying on medication include good communication with doctors and other health professionals, proper arrangements for follow-up appointments and maintaining good personal relationships. The support of family and friends is vital for improving treatment adherence.

Evidence suggests behavioural therapies, alone or in combination with educational interventions, may improve treatment adherence compared to standard care. Many interventions may be freely available through local community mental healthcare services.

By continuing to take their medication, people with schizophrenia will not only improve the management of their disorder, gain a positive attitude towards treatment and increase their insight and confidence but they'll also develop an understanding that taking medication is better than living with the consequences of not taking it.

For more information visit *www.schizophreniaresearch.org.au/library/home.php*

Lyn shows off her new iPad

A useful reward for an inspiring fundraiser

You would be excused for thinking a progressive physical disability, which restricts activity and confines you to spending most days in bed, is enough to stop you doing most things in life. But it doesn't hold back Lyn Colquhoun. The Queensland mother, who has mitochondrial disease, raised the most money in the annual SwearStop fundraising campaign in May and deservedly won an iPad.

Lyn decided to raise funds for schizophrenia research because, "It's a cause close to my heart," and she wasn't prepared to let her illness stop her being part of the campaign. After signing up on facebook and posting a daily blog, all from her bed, Lyn mounted a carefully planned online crusade to get support.

When informed that her efforts to raise more than $1,800 was the highest single amount, winning her the sponsored iPad, Lyn's only concern was that it hadn't been paid for out of donations.

The tablet computer could not have gone to a more deserving recipient. Muscle weakness and intermittent difficulties with speech are part of Lyn's condition. The lightweight iPad will literally be a 'hands-on' communications tool for her at these times. "It'll save me and those I communicate directly with, so much frustration and confusion."

Congratulating Lyn on her fundraising success, Kel Beckett, Director of Development at the Schizophrenia Research Institute, said her efforts were quite amazing. He hopes she'll be an inspiration to others in next year's SwearStop.

A tradition of giving helps schizophrenia research

When a group of people who can trace their heritage to a small Greek island, donated $10,000 for schizophrenia research, they followed a set of principles established by migrants who came to Australia more than 100 years ago.

They were pioneering settlers from Kythera; hard-working, industrious and resourceful, who, after arriving in Australia set up the Kytherian Association with the aim of maintaining their heritage but pledging to contribute positively to building Australia.

That generosity was seen at the Association's Annual Debutante Ball in Sydney in May when Kel Beckett, Director of Development at the Schizophrenia Research Institute received a $5,000 cheque from the Kytherian Association and $5,000 from the Kytherian Ladies' Auxiliary.

While mastering Greek dancing may still have a way to go for Kel, his warm-hearted thank you, '*efharistó*' in Greek was clearly understood.

Kel Beckett accepts cheque from Victor Kepreotos. Pres. Kytherian Association

How every dollar helps

Here's a question that charities and fund raisers are often asked. How will my donation help even if it's only a relatively small amount? The ANZ Trustees' *The Journey of Giving'* publication, recently put that question to Kel Beckett, Director of Development at the Schizophrenia Research Institute.

"Everyone knows that research is expensive but the question prompted us to have a look at what research money will buy," said Kel, who's responsible for fund raising at the Institute.

To show how the money is spent, he came up with a range of research activities being carried out by the Australian Schizophrenia Research Bank which require financial support.

- $300 will fund an MRI brain scan.
- $1,500 will help fund a kit to investigate gene expression changes in schizophrenia.
- $2,000 will cover the cost of collecting information from one volunteer for the Australian Schizophrenia Research Bank.
- $5,000 can provide the consumables for a research student to explore neurotransmitter systems.

For Kel Becket, it's not the size of a donation that's important. "All donations, large or small, have the collective effect of making a significant difference to the size and scope of research projects that the Institute can undertake," he said.

Making a point about schizophrenia

Kathleen in training mode

If you plan to take part in this year's City2Surf, look out for a woman wearing a black mask and a large sign emblazoned with the word 'schizophrenia'. That will be Kathleen Smith, one of a number of eager supporters running to raise funds for the Schizophrenia Research Institute.

Kathleen decided to wear the sign because, "I'm going to show the world what it's like to live a double life with one of the most misunderstood labels in the world." She wants people to read the sign and be challenged by it.

She's donning the mask to visually demonstrate what she describes as her secret double life. "I can't be open with most people I meet about having schizophrenia because they might be sympathetic at first but this is eventually replaced with suspicion."

Kathleen started training in the freezingly cold, dark winter evenings around the streets of Canberra, with her husband, a friend and a dog called 'Frank'. Kathleen is fighting through the pain and discomfort of a hip injury to make sure she'll be lining up at the start. "To make my point about schizophrenia, loud and clear."

There's still time to support Professor Vaughan Carr who'll also be running in the event by going on line at **www.fundraise.city2surf.com.au/Vaughan_Carr841**

Vale: Frank Walker

People affected by schizophrenia lost a friend with the death of Frank Walker. The former President of Schizophrenia Fellowship died in early June, at the age of 69, from cancer.

While Frank made a successful career as a lawyer, judge and politician; being appointed the youngest Attorney-General in NSW at the age of 34, he will be remembered for his work in the area of mental health. The cause was close to his heart following the early death of his two sons who had schizophrenia. Vale Frank Walker.

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Many thanks to our supporters who have renewed their commitment to us and/or donated recently (April 2012 – July 2012)

For privacy reasons we have chosen not to list all our individual supporters but would like to take this opportunity to thank and acknowledge their generosity. The commitment of the community is vital to our ongoing success.

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