



Welcome to the new look Winter 2008 edition of BrainWAVES. The Brain Foundation would like to thank Phillip Collier of The Collier Agency in Sydney for generously donating their time and resources in providing the new artwork for the newsletter. Over the remainder of the year you will see changes in the way the Brain Foundation presents its information as The Collier Agency helps us to improve the layout of the information we provide to you, our readers and donors.

## Welcome and Thanks

Professor Matthew Kiernan has joined the Board of the Brain Foundation and has taken on the role of Chairman of the Scientific Committee for the 2008 Brain Foundation Research Grants. The Brain Foundation would like to thank Professor Michael Halmagyi for his many years of service as the Chairman of the Scientific Committee.

*Professor Philip Thompson  
President*

## 2008 Brain Foundation Research Grants

We are now accepting applications for the 2008 Brain Foundation Research Grants. The primary objective of the Brain Foundation Research Grants is to support individual researchers and research teams to conduct the highest quality research in neurological disorders including brain and spinal injuries. The grants are funded through the generosity of your donations and those from corporate sponsors. Since the Brain Foundation is now self funded, 100% of donations go to the research fund.

Applications for Brain Foundation Research Grants close on Friday 27 June 2008. Information on the grant process can be found on the Brain Foundation's website.

## ANZAN 2008 Conference

In May 2008, Australian and New Zealand Association of Neurologists (ANZAN) sponsored the Brain Foundation's attendance at the ANZAN Annual Scientific Meeting in Brisbane. It was a wonderful opportunity for us to meet the professionals whose research we support, old and new! We attracted great interest with our Nintendo competition (prize kindly donated by Nintendo Australia) which was won by Dr Chung.



*Professor James Lance AO, CBE and CEO Gerald Edmunds drawing the winning entry*

## Australian Competitive Grants Register

The Brain Foundation is very pleased to announce that we have been placed on the Australian Competitive Grants Register for 2008. Listing on the Register gives successful 2008 Brain Foundation Research Grant winners from educational institutions increased funding from the Australian Government for their research project and increases the real value of your donation to the Brain Foundation.

Contact the Brain Foundation  
PO Box 579, Crows Nest NSW 1585  
Telephone: 02 9437 5967 or 1300 886 660  
Fax: 02 9437 5978  
Email: [info@brinaustralia.org.au](mailto:info@brinaustralia.org.au)

Visit our websites [www.brinaustralia.org.au](http://www.brinaustralia.org.au) and [www.headacheaustralia.org.au](http://www.headacheaustralia.org.au)

# Research Grant Progress Report

## Pilot Study to Evaluate the Role of Tks5 in Malignant Glioma Invasion in Brain Tumours



**Chief Investigator - Dr Peter Lock**

This project aimed to: determine whether the Tks5 adaptor protein affects the invasion of brain tumour cells in laboratory and biological tumour models; and determine the expression levels and distribution of Tks5 in human brain tumours of differing grades of malignancy.

In phase 1 of the project we have

demonstrated clearly that glioma tumour cells (and as a comparison, melanoma cells) made to express increased levels of Tks5 (by genetic manipulation) have a dramatically increased capability to invade through gelatin matrix (gelatin is used in this assay to mimic a tissue barrier such as collagen). These studies strongly support a role for Tks5 in promoting invasion which we are now attempting to test further. Positive results in these experiments would identify Tks5 as a candidate molecular target for therapies to inhibit invasion.

For phase 2 of this project, we have successfully completed a survey of brain tumours to ascertain the relative levels of Tks5. This analysis included tissues from a total of 76 patients. The results show that 40% of highly malignant tumours (grade III and IV) express significant levels of Tks5. On the other hand, a lower fraction of less malignant tumours (29% of Grade II tumours) and a lower proportion of brain metastases (20% of melanoma

and breast cancer lesions in brain) express Tks5. The results suggest a greater involvement of Tks5 in high grade compared with low grade tumours and brain metastases. Work to determine the “distribution” of Tks5 in tumours is continuing.

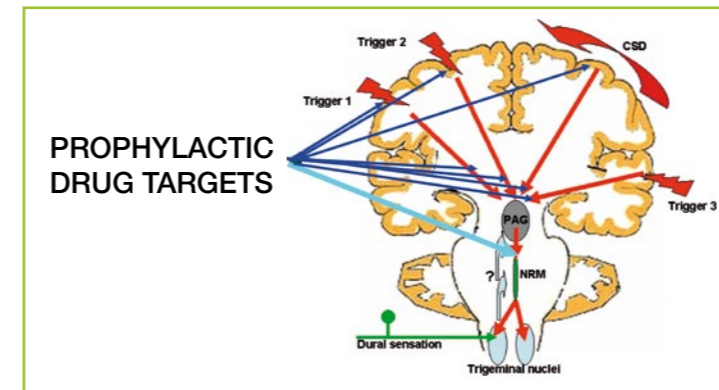
Experiments to determine if we can reliably detect Tks5 protein in test tissue samples have proved disappointing. In particular the reagents tested appear to be unsuitable for analysis of whole tissue specimens as they stain some tissues that do not contain Tks5 and in addition, cannot be blocked by addition of free Tks5 protein (this should occur if the signal is specific). We are therefore exploring alternative approaches to overcome these technical difficulties. In particular we are testing another Tks5 antibody that we have recently generated which we hope can be used to achieve the second phase of the project. That will be to establish mechanisms to eliminate the Tks5 protein and determine if that prevents the growth of tumours.

## Cortical-NRM-Trigeminal Pathway for Triggering Migraine

**Chief Investigator: Dr Geoffrey A Lambert**

We tested the idea that migraine triggers cause cortical activation, which selectively disinhibits craniovascular sensation through the nucleus raphe magnus (NRM) and thus produces headache. Stimulation of the dura mater and facial skin activated neurons in the NRM and the trigeminal nucleus caudalis. Electrical stimulation of the NRM caused suppression of responses of trigeminal neurons to electrical and mechanical stimulation of the dura mater, but not to stimulation of the skin. This suppression was antagonised by the iontophoretic application of the 5-HT<sub>1B/1D</sub> receptor antagonist GR127935 to trigeminal neurons. Migraine trigger

factors were simulated by cortical spreading depression (CSD) and light flash stimulation. Activity of neurons in the NRM was inhibited by these stimuli. Multiple waves of CSD gradually antagonised the inhibitory effect of NRM stimulation on responses to dural mechanical stimulation but not to skin mechanical stimulation. The experiments support previous cortical and brainstem postulates by showing that the cortex can inhibit neurons in the NRM and that this inhibition can lead to selective disinhibition of trigeminovascular sensory transduction. If this is so, the cortico-NRM-trigeminal neuraxis might provide a potential site of action for a universally-effective migraine prophylactic treatment.



*The cortico-brainstem-trigeminal neuraxis might provide a potential site of action for a universally-effective migraine prophylactic treatment ( → ).*

*The results suggest why current prophylactic agents are so diverse—they act at multiple cortico-brainstem sites ( → ).*

## Supplementary Oxygen for Acute Ischaemic Stroke: An Imaging-based Efficacy Trial (SOS trial)

**Chief Investigator: Dr Mark Parsons**

**Co-Investigator: Associate Professor Chris Levi**

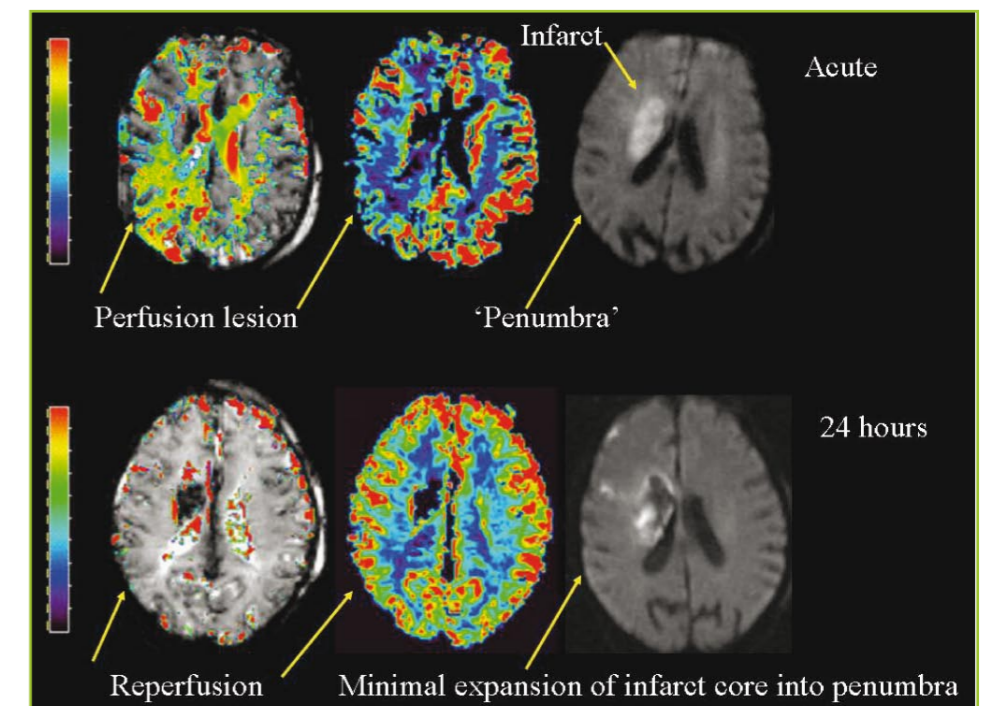
**Aims and Significance:** The aim of this study is to compare efficacy of supplemental oxygen (SO) in preventing the expansion of the infarct core in patients with acute ischaemic stroke patients presenting within 12 hours of symptom onset. Based on previous studies, we hypothesised that the greatest benefit would be seen in patients with the large volumes of ischaemic penumbra prior to receiving SO. Patients are randomised to high-flow SO or room air (providing they are not hypoxic). Oxygen is supplied via humidified air in nasal prongs at an inspired concentration of 90-100% for 24 hours after initial brain imaging with multi-modal CT or MRI. This imaging

allows us to visualise the extent of both irreversible injury (infarct core) and reversible ischaemia (penumbra). Imaging is then repeated immediately after cessation of SO, and then again at 1 week (to assess whether the penumbra progresses to infarction after cessation of SO. The primary hypothesis of this study is that SO will ‘preserve’ or protect the penumbra from progressing to infarction. This may buy time for the penumbra to be salvaged by reperfusion (either spontaneously or with thrombolytic treatment). This is a proof-of-concept imaging study, where the primary outcome is imaging based (i.e. is the penumbra protected after 24 hours of high-flow SO?) If this study suggests benefit from SO, this will set the stage for future large scale SO trials (for

example, delivered pre-hospital arrival in ambulance).

**Progress:** The study began in February 2007 and initially we had proposed to exclude patients treated with thrombolytic drugs. However, due to the initiation of a new ambulance stroke protocol in the Hunter region at this time, there was a major increase in the number of acute stroke patients arriving at John Hunter Hospital within three hours of their stroke, leading to increased numbers of patients receiving thrombolysis. This is a good outcome for patients, but has unexpectedly led to limited numbers of patients being eligible for the SOS trial. Therefore, to improve recruitment we have amended the study protocol to allow thrombolysis treated patients to be included, and now patients are randomised to high-

flow SO or room air after stratification for thrombolytic treatment. As well as improving recruitment into the study, this protocol amendment will lead to valuable information on the neuroprotective effects of high flow oxygen in thrombolysis-treated patients, as there has been no study performed in this group previously. To date, 10 patients have been recruited into the trial. It is therefore too early to provide any definitive results. Brain images (MRI) of one study patient pre and post-high flow SO are shown in the figure. At baseline, there is a large penumbra (perfusion lesion much larger than the infarct core on diffusion imaging). After 24 hours of high-flow SO, there has been complete preservation of the penumbra from progression to infarction. Consequently, the patient had an excellent clinical recovery.



# Philanthropy in Action

## Northwest Committee, Tamworth

For over 20 years the Northwest Committee in Tamworth has held many functions and events to raise funds for the Brain Foundation.

Their extremely popular 5th Annual Christmas Fair will again be held at the Tamworth Racecourse on Saturday 22nd November from 9.30 am to 4.00pm.

Featuring a fantastic selection of market stalls, musical entertainment and children's amusements, it is a day not to be missed! Be there if you can.

The Northwest Committee would like to thank the following sponsors for their generous support of the Brain Foundation through the Christmas Fair:

- Joblinkplus
- Tamworth Jockey Club
- Tamworth City Toyota
- Qantaslink
- Marlon Dalton Artworks
- New England Credit Union Ltd
- Landmark Barraba
- Wardle Osborne Chartered Accountants
- ABC Radio
- 2TM - 92.9 fm
- Prime TV
- The Northern Daily Leader

## City 2 Surf

Thank you to our wonderful supporters in 2007 who ran in the City 2 Surf in Sydney and raised over \$3,000 for the Brain Foundation.

Are you running in the 2008 City 2 Surf or participating in another event? Think about creating a Hero page for yourself on [www.everydayhero.com.au](http://www.everydayhero.com.au) and getting sponsorship from family, friends, neighbours and work colleagues. All money raised goes into research for brain disorders and diseases.

Our everyday heros in the 2007 City 2 Surf were:

- Elise – running for Mum
- Dimi – running for Mum for brain injury
- Nila – Doing it for Dad (stroke)
- Peter, Vicky and Emma – running for “just a good cause”
- Victoria, Claire and Sharna

## Run Melbourne 2008

The Brain Foundation would like to wish Julian who is participating in the Run Melbourne fun run on Sunday 22 June 2008 all the best as he runs to raise funds for the Brain Foundation. If you would like to sponsor Julian or support the Brain Foundation as you participate in the Run Melbourne 2008 event see [www.everydayhero.com.au](http://www.everydayhero.com.au).

## Brain Foundation Fun Day in Brisbane on 8 March 2008



Carroll & Stacey Buckley with CEO Gerald Edmunds at the Fun Day in Brisbane

Stacey Buckley and her mother Caroll Buckley joined with the Brain Foundation to promote and conduct a Fun Day on Saturday 8 March to raise money for brain research for the Brain Foundation after Stacey's father Barry suffered from a very malignant brain tumour and sadly passed away.

The Brain Foundation would like to acknowledge the generous donations from the following businesses and individuals:

- A Party Party Shop
- Aitken Welding Supplies
- Albany Creek Party Hire
- Argus Australia
- Atlantic Pool Services
- Aussie Pooch Mobile
- Autobarn
- Big W Strathpine
- Breville
- Brisbane Broncos
- BrisWeigh
- BSG Australia
- Bundaberg Rum
- Bunnings
- Caroll Buckley
- City Hire
- Cutting Edge Framing
- Darren Williams Signs
- Direct Framing
- Ethel May's Apothecary
- Gensis Fitness Club
- J A H Freightmaster
- Katrinas Beauty Works
- KB Hire and Sales
- Kensim Pty Ltd
- Marque Hotel

- Metro Express
- New Look Hair Salon
- NorthWest Employment Trust
- Point Of Sale Solutions
- Power Blasting
- Rent a Fence
- Rogue Traders
- Sam Mackinnon
- Sandcastles on the Beach Mooloolaba
- Stacey Buckley
- Stefan Dennis
- The Treatment Rooms

The following bands also donated their time to the Fun Day:

- Hi-Way-Two Band
- Sheree
- 6 PSI
- Ray and Mary
- Lois and Lefty
- Yvonne Barlow
- Jimmy Webb
- Black Heather
- Wayne Stuart
- Burning Mirrors
- Yield

The Brain Foundation would also like to thank all the people volunteered their time to help at the event and those who attended the event, bought raffle tickets, car club members and stall holders for helping to make the day such a success.

Stacey would also like to give a big thanks to all her family and friends who helped before or on the day.

# Headache and Migraine

Headache Australia is compiling a National Chronic Headache and Migraine Register to assist us to gain more funds for research into these debilitating conditions.

## Migraines in Young People

Migraines in young people can be as disabling as it is in adults. They can be debilitating, affecting the young person's ability to participate in activities and social events and their performance at school may suffer.

Here are some migraine management tips to share with young people to help them better manage their migraines.

- Try to get to know the signals.
- Regularise your sleep patterns.
- Never let yourself get hungry.
- Balanced diet
- Keep hydrated with water.
- Try and relax when studying.
- Light and regular exercise will also help to reduce the frequency of attacks.
- Try and stay on top of assignments and homework as the stress of approaching deadlines may be a trigger.
- Always do your homework and study in well-lit surroundings.
- Ensure you have a comfortable desk and chair to work as bad posture may be a trigger.
- Make sure your overall posture is good.
- If something is bothering you, talk about it.
- It has been recognised that crying quite heavily can trigger an attack, so if you are upset, try to avoid other triggers to prevent the onset of an attack.

- Keep a Migraine Diary. Keeping a diary can help your doctor, yourself and your parents to identify patterns and trigger factors. It can also aid the doctor in making a diagnosis.

## Tips for Handling Migraines at Work

These are also useful general lifestyle tips.

- Understand that migraine is a real disease – and not just a bad headache. Migraines are recognised as a neurological condition.
- Make changes to your work environment to reduce your susceptibility to migraine triggers.
- Ask co-workers to be sparing on perfume and cologne if powerful smells are a trigger.
- Watch your intake of caffeine at work.
- Keep yourself hydrated with water, not tea, coffee, soft drinks or dairy drinks.
- Do not skip meals, always bring a healthy snack to work to ensure you do not get too hungry.
- Concentrate on maintaining a good posture and stretch regularly.
- Eye strain can increase your chances of getting a migraine.
- Ensure you have an anti-glare screen on your computer.
- Get to know your own migraine patterns so that you can spot early signs of a migraine attack. Wherever possible, take your medication early.
- If your migraines are impacting you in your work, then your doctor can work with you on a treatment plan to help you.

Visit [www.headacheaustralia.org.au](http://www.headacheaustralia.org.au) under the “management” section for the tools to help keep track of your migraines, Chronic Headache and Migraine Diaries for women, men and children and the Helping Your Doctor Treat Your Headache form.

## South Australia - Helping those with a Brain Injury



Scholarship recipient Michael Klingner and the Honorable Jay Weatherill, Minister for Disability

The Sir Charles Bright Scholarship Trust provides financial scholarships to people with disabilities who are undertaking post secondary education within South Australia at either university, TAFE or other recognised educational institutions. Each year the Brain Foundation in South Australia funds two scholarships to assist two students with a brain disease, disorder or injury.

The Minister for Disability, Jay Wetherill presented this year's scholarships to Mr Michael Klingner and Ms Ayesha Tiwary at the Roma Mitchell Arts Centre in Adelaide.

## Brain Foundation Tasmania

Since 2005 the Brain Foundation in Tasmania has concentrated upon stroke educational and carer programs for stroke survivors and carers. The Brain Foundation Board felt that there was considerable demand in this important area that could not be met with the resources available. Discussions were held with the National Stroke Foundation who did not have representation in Tasmania and was keen to start up to help people in need there. As a result the Brain Foundation's government programmes were transferred to the National Stroke Foundation and the Brain Foundation is now focussing upon its brain research program in Tasmania.

# In Memoriam

The President, Directors and Staff pass on their condolences and gratefully acknowledge gifts in memory of the following people since the last Brainwaves Newsletter.

- Bill Webb
- Matt Price
- Peter Goddard
- Rita Patel
- Eric John Wills
- Elspeth Nita Springall
- Jordan Elms

- Margaret Hoddinott
- Irene Castell
- Maxwell William Alvin
- Brenton Cibich
- David Wallage
- Ippolito Paul Cuda
- Robin Burbidge

We continue to revere the memory of those for whom gifts have already been made and especially those who kindly made bequests to the Brain Foundation.

## How YOU can help fund BRAIN RESEARCH

You can help fund brain research by:

- Making a donation
- Giving the gift of Brain Research instead of a birthday present or a wedding gift.
- Make a bequest to the Brain Foundation in your will
- Use the Everyday Hero site [www.everydayhero.com.au](http://www.everydayhero.com.au) or the Mycause website

[www.mycause.com.au](http://www.mycause.com.au) for an easy way to create a hero or events page to both advertise and collect the donations.

- Workplace giving
- Funeral Tributes

The Brain Foundation is self funding so **100%** of your donation or bequest goes directly to the **research fund**.

# Special Gifts

## A New Beginning



During the preparations for our recent wedding my now husband, Tony and I decided we would ask our wedding guests that in lieu of wedding presents, they would make a donation to the Brain Foundation in memory of my first husband, John.

John was diagnosed with a brain tumour in November 1997, and sadly passed away in June 1999 at the age of 46 years.

We are pleased to advise that our guests donated over \$1,000 to the Brain Foundation. Thank you also for acknowledging our donation, it certainly makes me feel it was all worthwhile and that we are helping a worthy cause.

*Raelee*

## I would like to support brain research.

Please complete this form and return it to the Brain Foundation at  
PO Box 579 Crows Nest, NSW 1585, or fax to 02 9437 5978, or contact the Brain Foundation on 02 9437 5967.

Name \_\_\_\_\_

Address \_\_\_\_\_  
\_\_\_\_\_

State \_\_\_\_\_ Postcode \_\_\_\_\_

Telephone (     ) \_\_\_\_\_

Mobile \_\_\_\_\_

Email \_\_\_\_\_

### I would like further information about:

- Events |  Making a bequest

### I would like to receive the bi-annual BRAINwaves Newsletter by:

- Post |  Email

### Please accept my tax deductible donation to the Brain Foundation:

- \$200 |  \$100 |  \$50 |  Other \_\_\_\_\_

### Regular Donation:

I would like to make a regular donation to the Brain Foundation. Please debit my credit card for \$ \_\_\_\_\_ per month until I notify you.

### Please find my cheque payable to Brain Foundation enclosed **OR** Please debit my

- Mastercard |  Visa |  AMEX

Card No. \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_

Expiry Date \_\_\_\_\_ / \_\_\_\_\_

Name on Card \_\_\_\_\_

Cardholders signature \_\_\_\_\_

Thank you for supporting brain research through the Brain Foundation.