

# Eyelights

The Newsletter of **GLAUCOMA NZ**  
TO SAVE SIGHT

## '45 Plus 5' Glaucoma Awareness Week

The spotlight will be on glaucoma between June 16th and June 23rd when Glaucoma NZ mounts a special awareness campaign.

Media coverage during Glaucoma Awareness Week will include broadcast interviews and printed articles featuring eye health professionals and glaucoma patients. Several Glaucoma NZ members have agreed to be spokespersons to help publicise the important message that blindness from glaucoma is preventable if people have regular eye examinations.

In conjunction with Glaucoma Awareness Week public information meetings will be held in five of the larger centres. This year the particular focus of the presentations is laser and surgical treatments. See the back page of this newsletter for times and dates of the meetings.



Last year Glaucoma NZ's main campaign focused on the increased risk associated with a family history of glaucoma. This time the key idea is that anyone can develop glaucoma, and that all people in their forties and beyond should have regular eye checks for glaucoma. A catchphrase will be '45 plus 5'. Glaucoma NZ's recommendation is that everyone should have their eyes examined at age 45, every five years thereafter until 60, then three yearly after that.

Celebrities will be invited to assist the Glaucoma Awareness Week campaign by being photographed having their eyes examined for glaucoma. Is there someone in your family well known in the community? If he or she would be willing to endorse the glaucoma awareness message by taking part in a photo shoot please contact us urgently. (See contact details on back page.) Glaucoma NZ needs all the help we can get to alert people in their forties to the fact that glaucoma is a health issue they cannot afford to ignore.

**Glaucoma Awareness Week**  
16th-23rd June 2007

Volume 4, Issue 2

May 2007

### Inside this issue:

The Genetic Basis of Glaucoma .....	2
Ganglion Cells .....	3
Glaucomas Q & A's .....	4
Awards Presentation .....	5
Bequests .....	6
Eye Drop Aids .....	7
New Staff Member .....	7
Forthcoming Meetings .....	8

### Principal Sponsor



*Life is our life's work*

### Free Membership Sponsors



We make it visible.

### Supported by



## The Genetic Basis of Glaucoma Part Two of Three

This is the second in a series of three articles written for our readers by Dr Andrea Vincent, recipient of a research grant from Glaucoma NZ in 2007 for research into the genetics of glaucoma in New Zealand.

### Genes in Glaucoma

Research worldwide over the last 15 years has considerably expanded our understanding of the genetic basis for glaucoma. Finding a gene or genes that appear to cause glaucoma is crucial to further understanding the aberrant processes that cause raised pressure or nerve damage. Ideally this information may allow us to conjure up new treatment strategies. More importantly, genetic screening can identify family members of affected individuals who carry a mutation but have not yet developed the disease. This allows these at-risk individuals to be screened regularly, and treatment instigated before there is irreversible glaucomatous damage and vision loss.

Myocilin was the first gene known to cause glaucoma to be discovered in 1995.

This gene on chromosome 1 (Figure 1), makes a protein that is secreted in the trabecular meshwork (drainage angle) of the eye. It is most likely that mutant Myocilin protein causes glaucoma by damaging the trabecular meshwork, thereby impairing outflow of aqueous fluid from the eye.

Mistakes in Myocilin account for 4% of individuals affected with glaucoma worldwide, but given the prevalence of glaucoma, this is still a large number. Myocilin mutations account for 10% of disease in families known to have Juvenile open angle glaucoma (onset before 40 years). Certain mutations are known to cause early onset of disease with

very high pressures, and it is demonstrated these patients respond better to early surgery than to medical treatment. Other mutations, including the most common (Q168X), cause a later-onset glaucoma with mild pressure elevation.

Several groups have shown that some individuals carry two mutations; one in Myocilin, and one in CYP1B1, a gene known to cause congenital glaucoma. Congenital glaucoma is caused by 2 mutations in CYP1B1. The glaucoma associated with Myocilin AND CYP1B1 is more aggressive, with an earlier onset than Myocilin alone.

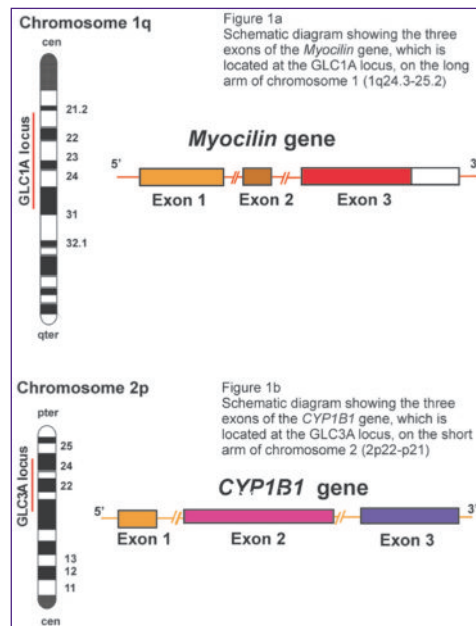
Another gene described is Optineurin (OPTN). This gene located on chromosome 10 appears to play a role in protecting the optic nerve head against pressure and other insults. Mutations are known to occur in individuals with Normal

tension glaucoma, and may render the optic nerve more susceptible to insult. Mutations in this gene probably account for 2% of all glaucoma.

Similarly WDR36 may cause 1% of glaucoma, but the mechanism of action is still unclear.

Extensive research has pinpointed the chromosomal positions of at least another 8 genes involved in glaucoma, but ongoing worldwide research is necessary to further identify these genes, and how they cause glaucoma.

The next instalment will discuss how New Zealand research is contributing to this knowledge.



## Ganglion Cells

### Nerve cells that transmit vision to the brain

Not infrequently patients ask if the eyeball is taken out of its socket for operations. Apart from damage to adjacent tissues, removal of the eye is prevented by its attachment to the brain through the optic nerve: the nerve which communicates vision to the brain

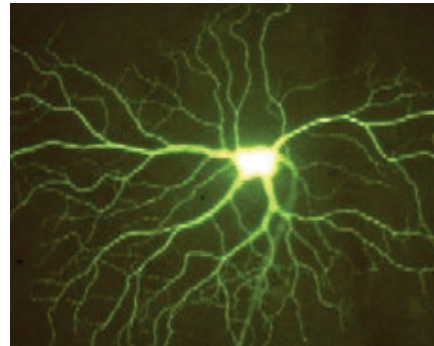
#### What is within this optic nerve?

Predominantly nerve cells called ganglion cells. Ganglion cells are fascinating structures. Their cell body is in the retina and it has a very long process called an axon of about 6cms in length. For comparison if the cell body was enlarged to the size of an iPod, then the axon would be a cable long enough to download information to your neighbour's computer three doors down the street.

The axon passes through the optic disc, into the optic nerve to the optic tract on one side or the other, to end in a small structure called the lateral geniculate nucleus. Over half (55%) of the ganglion cell axons cross from the right eye to the left optic tract, and vice versa for the left eye. Therefore a visual stimulus from the right side of our visual field will cause ganglion cell messages from both eyes to come together in the left optic tract.

The axon cannot itself produce chemicals such as proteins, lipids and transmitter substances. These are conveyed from the cell body along the entire 6cms of axon at a speed of about 1cm per hour. This "flow" is called axoplasmic transport. When eye pressure rapidly escalates this transport stops, and it does so particularly at the optic disc.

Ganglion cells can die from many causes which affect the cell or any part of the axon. However, in glaucoma, along with death of ganglion cells there is loss of tissue at the optic disc to create the defect called glaucomatous cupping. That is why experts consider that the damage to ganglion cells in glaucoma occurs at the optic disc.



Ganglion cells come in different shapes and sizes and send a variety of different visual messages to the brain. Some are colour coded. Some ganglion cells respond best to one colour, e.g. Red, but are inhibited in their response if the stimulus is green. Some ganglion cells will respond more markedly if green is stimulating the adjacent neighbourhood ganglion cells.

Early damage in glaucoma may first affect ganglion cells that respond to blue stimuli and are inhibited by yellow. Short wavelength (blue) visual field tests have therefore been evaluated to detect early glaucoma. SWAP stands for short wavelength automatic perimetry: visual field testing with blue stimuli on a yellow background.

The function of ganglion cells can be evaluated by electro-diagnostic tests, which will be discussed in future articles. Finally new testing methods are evolving for direct observation of the health, sickness or death of ganglion cells in the living retina: in your eye by looking through the pupil.

Direct measurement of the health of ganglion cells may become the standard for the evaluation of glaucoma treatments.

## Glaucoma Questions & Answers

You are invited to send in questions for these pages. (Contact details appear on the back page.) Other GNZ members might also be interested in the answer to your question. The following questions were received from Glaucoma NZ members.

**My mother is sure she heard on Talkback Radio that there is a cure for glaucoma. Is this correct?**

Unfortunately your mother is mistaken. There is at this time no cure for glaucoma. Damage that has occurred to the optic nerve cannot be repaired. Treatment is focused on preventing further loss. It is likely that your mother heard discussion about advances made in the treatment of a different eye condition, possibly macular degeneration.

**I was recently diagnosed with glaucoma and advised to have a bilateral iridotomy right away. At the same time my father was also diagnosed and also advised to have iridotomy. I thought drops were the first line of treatment. Is it usual to have laser treatment so soon after diagnosis?**

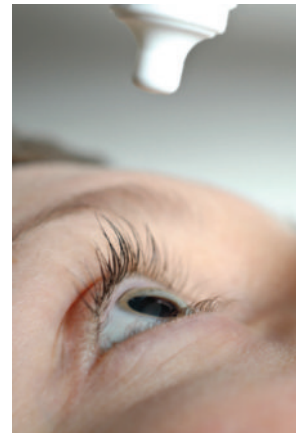
Treatment recommended differs according to what type of glaucoma you have. A peripheral iridotomy is essential treatment for eyes with the risk of angle closure glaucoma. It entirely prevents the possibility of an acute attack of angle closure. An acute attack is one of the most painful conditions known to humans and leaves the eye with long term problems. There is minimal downside to a laser peripheral iridotomy.

**Do I need to put my drops in at the same time each night?**

It is important to get into a routine and to put the drops in at around the same time each day, but the exact time is less important. An hour or two either side of your usual is unlikely to have any adverse effect.

**I use Xalatan in one eye and now have one eye with beautiful long eye lashes. I wish I'd had these in my younger days! But they seem to just keep on growing and growing. Will they keep growing indefinitely? They're already bumping into my glasses.**

It's unlikely you'll end up tripping over your lashes! The truth is that the drops prolong the life of the eyelashes. They continue to grow and so become longer. As with any hair lashes will be shed and new ones grow. Long eyelashes are rarely a problem!



**I have to go into hospital next month for an operation. Do I need to take my eye drops with me or can I give them a break for a while?**

It's very important to take your glaucoma medications with you and to continue with your glaucoma treatment. Make sure your doctors are informed that you take glaucoma medication. You can use your Glaucoma NZ ID card to record your ophthalmologist's name and the details of your medication. Sometimes glaucoma treatment gets overlooked because attention is being given to your other problems. Remind nursing staff if you think your drops have been forgotten.

### **Moving House?**

Don't forget to include Glaucoma NZ when you are doing your change of address cards. Remember, we have no way of knowing your new address if you don't tell us!

**I am a 37 year old male who does not know a lot about his biological history, so do I need to be tested for glaucoma, how much is it likely to cost and where would I go to get tested?**

Glaucoma NZ recommends that everyone should have a glaucoma test at the age of 45 and every five years after that. But if there's a family history of glaucoma or if you have other risk factors you should go much sooner, and then you will be advised by the optometrist or eye specialist how often to get repeat checks. Since you don't know your family history you would be wise to have an eye health check now. Other factors which would indicate you should go along sooner

than 45 would be if you're short-sighted, or if you've had an eye injury in the past or if you take steroid medication.

An optometrist is the person who can carry out a glaucoma check. Costs vary. You may wish to ring around. Otherwise your general practitioner may refer you to the local eye department where care is free. A full glaucoma examination requires assessing all the risk factors for glaucoma including eye disease, intra-ocular pressure, the optic disc and when necessary a visual field test. Generally it is only optometrists, eye specialists and eye departments who have the equipment to do this. You will be referred to an ophthalmologist if there is concern about glaucoma.

## Awards Presentation

Glaucoma NZ has presented an inaugural Professional Award to Hamilton glaucoma specialist Dr James Stewart. The award recognises Dr Stewart's outstanding voluntary contribution to Glaucoma NZ over the past four years. At the recent meeting of the Royal Australian and New Zealand College of Ophthalmologists in Tauranga GNZ Chairman Dr Ken Tarr presented Dr Stewart with a wall plaque and expressed appreciation for the large amount of time and support Dr Stewart has given to Glaucoma NZ.



*From left: Heather Hyland, Dr Ken Tarr, Dr Jim Stewart and Dr Zelda Pick*

A certificate was presented to Dr Zelda Pick, a non-training registrar at Christchurch Hospital Eye Department. Dr Pick contributed an excellent case-based seminar for Glaucoma NZ's professional education package.

Dr Tarr also announced the award of the 2007 Glaucoma NZ research grant to Dr Andrea Vincent for her study 'The Determination of the Genetic basis for glaucoma in a New Zealand population'.

### Do We Have Your Email Address?

From time to time we need to get in touch with Glaucoma NZ members and email is a very economical way of doing so. If you did not receive an email from me in April asking for interviewees for Glaucoma Awareness Week then we don't have your correct email address. Please send a message to [admin@glaucoma.org.nz](mailto:admin@glaucoma.org.nz) including your name and town. We can then update our records. Your address will not be passed on to anyone else.

Thank you, *Heather Hyland, Administrative Manager*

## Concern for Others Lives On With Bequests

Bequests are an important source of income for the non-profit sector. The wonderful thing about bequests is the long-term effect they have on the lives of New Zealanders. Many of the support services and research advances we enjoy today have been funded through the generosity of those who have gone before.

If blindness is important to you, and preventing blindness is important to you, you should consider Glaucoma New Zealand for your bequest. Glaucoma is the leading cause of blindness in New Zealand which can be prevented with your help. Glaucoma New Zealand applies the findings from a wide range of vision scientists and glaucoma specialists to the task of eliminating blindness from glaucoma.

We believe our aim to eliminate blindness from glaucoma can be achieved by

- Enhanced awareness in our community about glaucoma
- Information and support for people with glaucoma
- Education of eye health workers
- Research into glaucoma in New Zealand



There are several types of bequests. Some people leave a specific bequest such as a sum of money, land, shares or a motor vehicle. Others instruct their executors to sell their assets and then allocate the proceeds in proportions. One beneficial way to make a bequest to a charity is to leave the balance (residue) of your Estate to the charity after legacies to family and funeral and administration costs have been paid.

Nearly half of all New Zealanders have not made a will or have not kept their will current. A great deal of confusion and additional stress on family members occurs when a person dies without a clear will. Your decision to support Glaucoma New Zealand must be recorded in appropriate legal terms by your solicitor. Your solicitor can obtain a copy of our constitution if you desire. If you do already have a current will, a bequest does not necessarily require a new will. You can simply add a codicil to your existing will to include Glaucoma New Zealand. This is an inexpensive legal procedure.

We encourage you to gift to Glaucoma NZ for its general purposes. If you wish to specifically support research then Glaucoma NZ can assure that your gift will be solely used for glaucoma research in New Zealand and only to fund projects that have been independently assessed to be of high quality. Please contact us or visit our web-site for further details.

Leaving your bequest to Glaucoma New Zealand will substantially help us to achieve our goal. Our legal constitution assures you that the money must be appropriately spent. If you are concerned about blindness in New Zealand and wish to help prevent it happening then Glaucoma New Zealand is the organisation you should support. We are here to prevent blindness developing and to eliminate its effect from glaucoma in New Zealand.

## Eye Drop Aids

Many people find putting in their eye drops a challenging task. Sometimes the reason that patients don't comply well with their prescribed treatment is not forgetfulness or failing to take the doctor's instructions seriously – rather it's physical difficulty in accomplishing the task effectively. People with arthritis or a poor grip might find the bottle hard to unscrew. Others have difficulty in aiming the drop to land in their eye and have no one else at home to help them.

Various devices have been designed to address such problems. One clever little device is a small spanner which makes it easier to untwist the bottle top.

Another product named the 'Autosqueeze' cradles the bottle and has wide wings to make squeezing the bottle easy. This is especially helpful when the bottle is a firm one which is difficult to squeeze easily.

Some eye drop delivery devices are cylindrical in shape and provide not only a cradle for the bottle, but an eye cup which you place over your eye. The bottle is then correctly positioned to release a drop accurately into your eye. The small 'Autodrop' eye drop guide holds the eye open and directs the drop correctly.

Some devices combine an eye guide with a mechanism to aid squeezing or a button to push to dispense the drop.



Benefits from using such eye drop aids such as these include the fact that drops are not wasted when you miss your eye, and in the case of the dropper with the push button the correct amount is dispensed. If the task is made easier in these ways you're less likely to skip your drops, and so you are maximising the likelihood of a good outcome for your sight.

Eye drop aids such as the ones shown in the photo are available from your ophthalmology departments and eye clinics. If you have trouble obtaining one, contact the pharmaceutical company which manufactures your drops. They should be able to help you. It's important to realise that not all the aids shown here work for every type of eye drop. Some fit only one particular kind of bottle. An ophthalmic nurse at the Eye Clinic will be able to show you how to use the device that's suitable for your eye drop bottle. There are also a few commercially available products – ask your pharmacist.

## New Staff Member



We are delighted to welcome a new staff member in the Glaucoma NZ office. Karon Farmer will assist Heather Hyland with administration. She looks forward to meeting many of you at the June meetings in Auckland.

# YES, I would like to help

I would like to become a member of Glaucoma NZ at no cost

I would like to donate \$ \_\_\_\_\_

I enclose my cheque for \$ \_\_\_\_\_ made payable to Glaucoma NZ,  
or please debit my

Visa     Amex     Mastercard    Name on Card \_\_\_\_\_

Card No \_\_\_\_\_ Expiry \_\_\_\_/\_\_\_\_ Signature \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_ Phone No \_\_\_\_\_

Donations of \$5.00 or more are tax deductible

I would like information on leaving a bequest for Glaucoma NZ

## Forthcoming Meetings 2007

<b>June 16</b>	<b>North Shore</b> 10am Fairway Lodge, Argus Place, Glenfield
<b>June 23</b>	<b>Auckland</b> 10am NZICA Conference Centre, 27 Ohinerau St, Greenlane
<b>June 23</b>	<b>Tauranga</b> 10am Bureta Park Motor Inn, Vale St, Otumoetai
<b>June 23</b>	<b>Christchurch</b> 10am Christchurch Boys High School, Straven Rd
<b>June 30</b>	<b>Wellington</b> 10am National Library of New Zealand, Cnr Molesworth & Aitken Sts

### Contact Details

Glaucoma New Zealand  
Department of Ophthalmology  
The University of Auckland  
Private Bag 92019,  
Auckland 1142, New Zealand

Telephone: 09 373 8779  
Facsimile: 09 373 7947  
www.glaucoma.org.nz  
Email: info@glaucoma.org.nz

## The Trustees and Sponsors of

Dr Ken Tarr (Chairperson)  
Assoc Prof Helen Danesh-Meyer  
Gordon Sanderson  
Dr Mike O'Rourke  
John Bishop  
Dr Mark Donaldson

**We would like to thank our Principal Sponsor**  
Pfizer

**and our Free Membership Sponsors**

Alcon, Allergan and Zeiss

**Auditor** WHK Gosling Chapman, Takapuna