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Newsletter of Retina Australia (ACT) Inc

EDITION 1-2013

JUNE 2013

MESSAGE FROM THE PRESIDENT

My apologies to all members for the fact that this newsletter has been conspicuous by its absence, but my academic, sports administration, publishing and advocacy activities in other areas – plus family commitments - have devoured my time for much of the first part of the year. I shall try to keep you better informed in the second six months of 2013.

As a means, hopefully, of compensating for this absence, included in this edition is a wide variety of items relating to ongoing research into the cure for retinitis pigmentosa that we all crave. I hope that, like me, you will take the view that there is indeed 'hope in sight'.

ROBIN POKE

This newsletter is proudly sponsored by Elders Real Estate Belconnen

MEMBERS' "MONTHLY LUNCH DATE"

2nd Tuesday of the Month

This month we are going to:

Injoy Cafe

Shop 1 O'Hanlon Place

Gold Creek Village

This is a light and bright café with a delightfully eclectic and very reasonably priced menu, a great ambience and extremely good service. For those who like a drink with lunch, it's BYO.

The next monthly lunch is on **Tuesday 9th July 2013**

Please let me know if you have a problem with transport and I will try to arrange for someone to pick you up.

THOROUGHBRED PARK FUNDRAISER 2013

Our annual fundraiser will again be a luncheon and afternoon at the Canberra races. This year the date is a little earlier to avoid the frantic Christmas rush. *The date for your diary is Sunday 17th November 2013.*

We will have our usual raffle with lovely prizes and hopefully a wonderful painting from the well known Sunshine Coast artist Pauline Adair.

Jan James
Secretary
Ph 6258 4823

ANNUAL FUNDRAISER, 16th December 2012



Dr Terry Diamond was our very special guest speaker. Terry completed seven marathons in seven days to raise money for research into RP. Robin Poke is listening with great interest.



Here we are in the "Rich Rewards Room" at Thoroughbred Park enjoying a wonderful lunch washed down with lovely local wines.



David Kilby our fabulous Patron and MC for the function. David is a huge part of this very successful afternoon.



Sue King & Catherine Chapman from 'Women in Racing'.

Our thanks to all WIR members and friends who support us each year.

The afternoon was such a wonderful success. Our thanks go to all those people and organisations that donated gifts for our raffle, which helped us raise the amazing total of \$5772.20. These monies will be part of Retina Australia (ACT)'s contribution to national research into a cure for Retinitis Pigmentosa. Our sponsors were:

Catalo's Salon, B&B Last Stop Ambledown, Dream Design, Greengold Garden Centre, Federation Square, Yarrh Wines, Shaw Wines, Jeir Wines, Clonakilla Wines, Flint in the Vines Restaurant, Murrumbateman Country Inn, Harris Scarfe Belconnen, ACTAB, and to committee members who made Christmas Cakes and hats etc. A special thank you goes to Robyn and Colin Thomson of Murrumbateman, who visit the fabulous wineries each year to collect donations for our raffle.

ANNUAL GENERAL MEETING

Retina Australia (ACT) Inc. held its Annual General Meeting on the 27th November 2012. The following members were re-elected

Robin Poke, President

John Barlow, Vice-President

Jan James, Secretary, Events

Lyn Barlow, Secretary, Minutes

Doris Wallace, Treasurer

Barbara Burton, Committee

David Kilby, Committee and Patron

NEWS

New arrival

The happiest news of the year so far is the arrival of a baby boy. Lachlan James, for Rachel and Duane Stokes. Lachlan arrived on 12th April 2013 and weighed a healthy 3.4kg. Our congratulations to the happy parents and to Doris and Ian Wallace, the proud grandparents.



Faye unwell

Our thoughts have also been with Faye Martin recently. Faye, a former President, has had health problems over the last few months, but hopefully these are behind her and she is now heading in the right direction. Faye recently attended our monthly lunch, so it appears she is progressing well. Good on you Faye, keep up the good work.

Pedal Power

John Barlow and Lindy Hou are continuing to burn up the tarmac on their tandem bikes and are riding some amazing distances - like Charlottes Pass to Canberra and a 230 km race in Melbourne. Makes you feel exhausted just thinking about it!

Achilles Running Club

Peter and Merelyn, who are members of the Achilles Running Club in Sydney has got this Canberra group going. The aim of this is to give opportunity for people who are vision impaired to enjoy walking and running with a sighted guide. The group started a couple of months ago and has a few guides trained. It is looking for more vision impaired people to join the group.

It meet the 1st, 3rd and 5th Sunday of each month. The next session is on Sunday 30 June at 8:00 am at the usual place, the courtyard on the east side of Lake Ginninderra College.

If you are interested, please contact Peter & Merelyn on 6241 6288.

DATES FOR THE DIARY

We have included these events in case any of our members are travelling overseas when they are taking place and want to connect with our larger RP family.

National AGM to be held in Canberra

Members might be interested to know that the Annual General Meeting and Board Meeting of our national body, Retina Australia, is to be held at Rydges Lakeside, Canberra, on Sunday 8 September. Retina Australia (ACT) is therefore the 'host' organisation.

Delegates from all states will be arriving on Saturday evening, 7 September, and some members of the RA (ACT) committee will be having dinner with them at the hotel. Past presidents and any other members are also very welcome to attend.

They are also welcome to attend the AGM, scheduled to start at 9.30 a.m. the following day. However, the meeting of the Retina Australia Board is a closed meeting.

Visions 2013 - Baltimore, MD, USA

Join the Foundation Fighting Blindness USA for VISIONS 2013, where you will learn, share, experience and refresh your hope for the future. [read](#)

24.08.2013 -
24.08.2013
16h00 à 18h00

Troisième conférence scientifique internationale de Retina Pigmentosa ASBL-Gent, Belgique

The Third International Scientific Conference of the Retina Pigmentosa Association of Belgium will take place at Gent, Belgium, between 2 and 4 April 2014.

World Ophthalmology Congress 2014 - Tokyo, Japan

Be sure to register for the world's largest international ophthalmology conference—the World Ophthalmology Congress®—to be held from April 2-6, 2014 in Tokyo, Japan. Simply [click here](#) to learn more and register to visit this global ophthalmology congress during the most beautiful time of year in Tokyo. What's more, if you sign up before October 18, 2013, you can take advantage of our special Early Bird fees!

A little closer to home and what should be a fun outing at Luna Park!!

RETINA AUSTRALIA (NSW) ANNUAL FUNDRAISER

7th September Luna Park

5.30 – 8.30pm in the Ted Hopkins Room at Luna Park

\$120 per person including 2-course banquet and drinks, music guest speakers etc

More information: www.retinaaustraliansw.com.au

SHOPFRONT

iMove an iPhone app that supports visually impaired persons to move in urban environments

Retina Italia Onlus commissioned EveryWare Technologies to develop iMove, an iPhone app that supports visually impaired persons to autonomously move in urban environments. Thanks to iMove, an iPhone is now capable of reading the current address and the nearby shops. Moreover, it is possible to create audio notes that are played every time a user gets close to a given place. iMove is a free app that is distributed world-wide through the App Store

(<https://itunes.apple.com/app/imove/id593874954>). [read](#)

RESEARCH UPDATES

US scientists create embryonic stem cells through cloning

In a world first, US scientists have successfully created embryonic stem cells through human cloning. The technique used is considered ethically controversial because it requires an embryo to be created and then destroyed. The big advantage is that the embryonic stem cells that are gathered are a perfect genetic match to the person who gave the skin cells in the first place.

For years scientists have tried to perfect this particular cloning technique, but it's never been possible. In the past it's been successful with animals, but scientists at the Oregon Health and Science University in America say they've made a breakthrough using human cells.

Dr Shoukhrat Mitalipov, lead scientist of the project, says, "We have produced early stage embryonic stem cells so they're actually permanent cell lines, but they represent very early unprogrammed cells that have potential. They're basically charged with the ability to make any other cells and tissues and even organs."

The technique is called somatic cell nuclear transfer, or therapeutic cloning. Scientists took a person's genetic material and put it into a human egg. Then they created an embryo, which they then used to make a stem cell, which is genetically matched to that person.

Professor of Stem Cell Sciences at the University of Melbourne, Martin Pera, says the discovery is enormously exciting. "The discovery offers a new technique for treating patients who are at risk of passing on severe diseases, mitochondrial disorders, to their children and also offers a new approach for making stem cell lines that will enable us to match tissues for transplant patients to individual patients."

Professor Pera says many scientists had believed the technique to be impossible. Now he's expecting it to be used to develop treatments for genetic diseases. "In the UK the government has already been advised there that they should proceed with using this type of technology to help people who are at risk of passing on mitochondrial disorders. These are severe diseases that affect particularly the brain and the heart and I think now that we have the ability to actually use this cloning technology or somatic cell nuclear transfer in man, the road ahead is clear and I think there will be groups who will be interested in using this technique very soon to try and help those patients."

Professor Pera thinks the discovery has so much potential, ethical concerns about the technique will soon dissipate. "Oh, well I think in the scientific community and in the medical community and for patients suffering from these disorders, there'll be a lot of excitement around it. Of course this approach is permissible in Australia, so Australian scientists could pursue the same avenue and I think in general where we look at the potential for alleviating disease and when that potential becomes real, then some of the objections I think tend to diminish."

Source: Edited from ABC Radio report, 16 May 2013.

Growing the Apple of an Eye In-Vitro

A retina made in a laboratory could pave the way for treatments for human eye diseases, including some forms of blindness. The project is led by Yoshiki Sasai, group director of Organogenesis and Neurogenesis at RIKEN Centre for Development Biology in Kobe, Japan. Created by coaxing mouse embryonic stem cells into a precise three-dimensional assembly, the 'retina in a dish' is by far and away the most complex biological tissue engineered yet, scientists say.

"There's nothing like it," says Robin Ali, a human molecular geneticist at the Institute of Ophthalmology in London, who was not involved in the study. "When I received the manuscript, I was stunned, I really was. I never thought I'd see the day where you have recapitulation of development in a dish."

If the technique can be adapted to human cells and proved safe for transplantation — which will take years — it could offer an unlimited well of tissue to replace damaged retinas. More immediately, the synthetic retinal tissue could help scientists in the study of eye disease and in identifying therapies. The work may also guide the assembly of other organs and tissues, says Bruce Conklin, a stem-cell biologist at the Gladstone Institute of Cardiovascular Disease in San Francisco, who was also not involved in the work. "I think it really reveals a larger discovery that's coming upon all of us: that these cells have instructions that allow them to self-organize."

During development, light-sensitive tissue lining the back of the eye, called the retina, forms from a structure known as the optic cup. In this study, this structure spontaneously emerged from human embryonic stem cells (hESCs) - cells derived from human embryos that are capable of developing into a variety of tissues - thanks to the cell culture methods optimised by Sasai and his team. The process starts when embryonic stem cells aggregate and begin to form the very early optic vesicle after about five days of being mixed with molecules called growth factors. The vesicle balloons out by day 7, and a few days later the structure collapses to form the optic cup, which by day 24 has delineated all the layers of the retina.

Beyond the clinical implications, the study will likely accelerate the acquisition of knowledge in the field of developmental biology. For instance, the hESC-derived optic cup is much larger than the optic cup that Sasai and collaborators previously derived from mouse embryonic stem cells, suggesting that these cells contain innate species-specific instructions for building this eye structure. "This study opens the door to understanding human-specific aspects of eye development that researchers were not able to investigate before," Sasai says. For instance, we may be able to create artificial retinas that help researchers explore the pathology of common eye diseases, perhaps leading to the development of drugs and gene therapy to reverse retinal degeneration."

Three categories of retinal degeneration that might benefit from this research are macular degeneration (MD), retinitis pigmentosa (RP) and glaucoma. MD seems the most amenable of the three to being eased by cell-replacement therapy. Human embryonic stem cells and induced pluripotent stem cells can generate the support tissue, known as retinal pigment epithelium, relatively easily when grown in conventional culture as well as by this new method, and cells can be retrieved directly from these cultures. Early clinical trials are already under way, in which stem cell-derived pigment epithelial cells are injected with a fine needle into the space between the pigment epithelium and photoreceptor layers to replace at least part of the damaged tissue.

Cell therapy for RP requires additional technical advances before it can be offered to humans. This technique, unlike a conventional culture, can generate rod photoreceptors in a cell-dense sheet suitable for transplantation, but we need another critical tool before transplants of such sheets can improve vision. Unlike the simple support tissue of epithelium, photoreceptors need to integrate into the eye's neural circuitry; specifically, they need to reconnect to another type of sensory cell, a bipolar cell, and we do not yet know how to make that linkage happen efficiently. Transplantation of photoreceptors, if successful, would be expected to enable those with even advanced RP to recover at least some of their vision.

Glaucoma may be the most difficult of the three diseases to treat through cell therapy. Embryonic stem cell cultures are capable of generating ganglion cells needed for this endeavour. In the postnatal eye, however, optic nerve regrowth is suppressed, and no one has yet figured out how to induce their axons (the branches that send signals into the brain and that form the optic nerve) to reconnect with other cells.

We have learned that embryonic stem cell derived tissues can do much more than we currently achieve through artificial tissue engineering in which cells are placed on scaffolds shaped like a layer of skin or a bladder. The challenge is now to uncover what developing cells can teach us about the intricate processes that lead from a single cell to an organ as complex as the eye.

Sources: Scientific American 31, November 2012. Nature, 6 April 2011, Science Daily, 13 June 2012.

Totally Blind Mice Get Sight Back

Totally blind mice have had their sight restored by injections of light-sensing cells into the eye, UK researchers report. The team in Oxford said their studies closely resemble the treatments that would be needed in people with degenerative eye disease. Similar results have already been achieved with night-blind mice.

Experts said the field was advancing rapidly, but there were still questions about the quality of vision restored. The research team, at the University of Oxford, used mice with a complete lack of light-sensing photoreceptor cells in their retinas. The mice were unable to tell the difference between light and dark. They injected "precursor" cells which will develop into the building blocks of a retina once inside the eye. Two weeks after the injections a retina had formed, according to the findings presented in the Proceedings of the National Academy of Sciences journal.

Prof Robert MacLaren said: "We have recreated the whole structure. Basically it's the first proof that you can take a completely blind mouse, put the cells in and reconstruct the entire light-sensitive layer." Previous studies have achieved similar results with mice that had a partially degenerated retina. Prof MacLaren said this was like "restoring a whole computer screen rather than repairing individual pixels".

The mice were tested to see if they fled being in a bright area, if their pupils constricted in response to light and had their brain scanned to see if visual information was being processed by the mind.

Prof Pete Coffee, from the Institute of Ophthalmology at University College London, said the findings were important as they looked at the "most clinically relevant and severe case" of blindness. "This is probably what you would need to do to restore sight in a patient that has lost their vision," he said. However, he said this and similar studies needed to show how good the recovered vision was as brain scans and tests of light sensitivity were not enough. He said: "Can they tell the difference between a nasty animal and something to eat?"

Prof Robin Ali published research in the journal *Nature* showing that transplanting cells could restore vision in night-blind mice and then showed the same technique worked in a range of mice with degenerated retinas. He said: "These papers demonstrate that it is possible to transplant photoreceptor cells into a range of mice even with a severe level of degeneration. I think it's great that another group is showing the utility of photoreceptor transplantation."

Researchers are already trialing human embryonic stem cells, at Moorfields Eye Hospital, in patients with Stargardt's disease. Early results suggest the technique is safe but reliable results will take several years. Retinal chips or bionic eyes are also being trailed in patients with retinitis pigmentosa.

Source: Daily Star Online, 6 January 2013.

Stem Cell Breakthrough

Researchers at the University of Nebraska Medical Centre have announced a significant step in adult stem cell research that could take science closer to cures for glaucoma and age-related macular degeneration. A team led by Iqbal Ahmad, Professor of Ophthalmology and Visual Sciences, used adult stem cells from the cornea, the clear window at the front of the eye, and reprogrammed them to act like cells in a developing baby's retina. The retina, located at the back of the eye, transforms light into neural signals that can be interpreted by the brain, an essential part of vision.

Ahmad said the team's work built off that of Drs. John B. Gurdon and Shinya Yamanaka, who won this year's Nobel Prize in science after they genetically altered adult stem cells to mimic embryonic stem cells. Before the pair's discovery, scientists believed embryonic cells, which have far greater potential to develop into different types of cells, could come only from embryos. In that early breakthrough, researchers directly manipulated gene expression inside cells to cause them to reset themselves to a more primitive state.

The real advance of Ahmad's team came in causing adult stem cells to change by placing them in a chemical environment similar to what might be encountered inside the eye of a developing fetus. The team next took the reprogrammed cells and transferred them into a mice model of glaucoma, where they survived and integrated just like actual retinal ganglion cells - the interface between cells that react to light and nerve cells.

The experiments took place in a dish, but the reprogrammed cells did hook up as desired, Ahmad said. "They have the potential to restore the circuitry." In a coming experiments, he said, researchers will try to discover whether the new cells truly integrate in ways that could restore sight. The group's approach might be adapted to resolve other problems that cause blindness, he said, such as age-related macular degeneration. In that case, the adult stem cells could be reprogrammed by a different chemical environment to resemble the eye's photoreceptors, cells that react to light. Those cells are very similar in makeup to retinal ganglion cells.

Such modified cells also can be studied to see what genes are responsible for sight degeneration and what genes fight vision loss. This could lead to drugs that block the degenerative genes or bolster genes that fight vision loss, Ahmad said. "We've shown that changing the environment around these adult stem cells can change the cells themselves," Ahmad said. "We now seek more efficient ways to create these transformative environments to cultivate these powerful cells that may offer hope to so many." The group's work has shown enough promise to secure a \$1.48 million, four-year grant from the National Institutes of Health.

Source: Mark Anderen, Lincoln Journal Star, 22 January 2013.

Implants offer hope in fight against retinitis pigmentosa. Different approaches by Retina Implant and Second Sight show the progress made in combating the condition

The disease *retinitis pigmentosa* (RP) includes a number of subtly different vision disorders thought to ultimately arise from an inherited retinal degeneration.

For sufferers, the consequences of the condition can be drastic: cells in the retina fail to function properly, often starting with peripheral rod cells and progressing to the central cone cells, and progressive sight loss results.

Although the condition is at present incurable, advances in the field of retinal implants demonstrate the progress now being made in combating the condition and restoring a measure of sight to those afflicted.

Two developers of implants tackling the problem have recently announced significant progress.

Subretinal Implant

In February 2013 **Retina Implant**, based in Germany, announced results from the first stage of a multi-centre clinical study into the use of its subretinal implants as a treatment for RP. The study was published in the journal *Proceedings of The Royal Society B*.

The trial found that during the course of a three to nine month observation period, functional vision was restored in the majority of nine German patients implanted with the company's Alpha IMS microchip. This represented part of the first module of the Company's second human clinical trial.

Visual acuity for two of the patients surpassed the visual resolution of patients from the company's first human clinical trial, according to the company.

"Alpha IMS is a subretinal implant, placed below the retina in the macular region," Walter-G. Wrobel, CEO of Retina Implant, told optics.org. "This approach leverages the natural movement of the eye to capture and interpret images, unlike other approaches to retinal implant technology which use an externally-worn camera to process images."

The implant is positioned at the level of the photoreceptor cells in the retina, from where it can directly stimulate other retinal cells and make full use of those inner and middle retinal layers that remain correctly functioning.

In use, light-sensitive diodes in the 3 mm x 3 mm x 70 um microchip respond to incoming light and pass a current into the underlying retinal cells. Wrobel commented that "our device has 1,500 electrodes, which is the largest number of any other implant currently in clinical trial."

The system requires an external power supply to function, and the patient alters perceptual parameters such as brightness and contrast by adjusting the power unit. "The human eye is much more light sensitive than any camera chip, therefore an external power supply is used to amplify the electrical signals from the chip," noted Wrobel.

At present the Alpha IMS implant is intended only for the treatment of RP, although Retina Implant has indicated that it may eventually be tested against other conditions, such as macular degeneration.

"While we believe there is potential in the future for other degenerative eye conditions, we are currently focused only on RP and on bringing this technology to market for patients with late-stage RP who could benefit from it," confirmed Wrobel. "Ours is the first and only subretinal implant in clinical trials, and performance and usability set new standards for retinal prostheses. Recognition of daily-life objects, and reading of letters and words, was first demonstrated with our device."

Alongside the implant's undoubted success, the clinical trial also reported some potential stability problems affecting certain patients fitted with Alpha IMS. Wrobel indicated that Retina Implant had tackled these issues through changes to the design and procedures used, and that the company continued to focus on performance and reliability enhancements.

"We have been working intensely on solving these issues, and have made a lot of progress in the laboratory," he said. "These improvements are currently confidential and proprietary, but we are confident that we have solved these problems."

FDA Approval for Argus II System

After more than 20 years of research and development, Second Sight Medical Products, Inc. is pleased to announce that its Argus® II Retinal Prosthesis System ("Argus II") has received United States market approval from the Food and Drug Administration (FDA) to treat individuals with late stage Retinitis Pigmentosa (RP). This announcement follows receipt of the European approval in 2011, and a unanimous recommendation by the FDA's Ophthalmic Devices Advisory Panel in September 2012 that this revolutionary product be made available to treat this patient population in the United States.

"The Argus II has the potential to provide life-changing vision capabilities as well as increased mobility and independence. We are thrilled to be able to offer the only FDA-approved long-term therapy for people suffering from advanced RP," said Robert Greenberg, MD, PhD, President and CEO of Second Sight. "With this approval, we look forward to building a strong surgical network in the United States and recruiting new hospitals that will offer the Argus II retinal implant. This is a game changer in sight-affecting diseases, that represents a huge step forward for the field and for these patients who were without any available treatment options until now."

Argus II is intended to provide electrical stimulation of the retina to induce visual perception in blind individuals with retinitis pigmentosa and has the capacity to offer life-changing visual capabilities to those currently unable to see anything except, at best, extremely bright lights. Although the resulting vision is not the same as when these patients had normal vision, investigators involved in the clinical trial of the Argus II are eager about the approval.

"It is incredibly exciting to have FDA approval to begin implanting the Argus II and provide some restoration of vision to patients blinded from RP. In the patients that have been implanted to date, the improvement in the quality of life has been invaluable," said Mark Humayun, MD, PhD, Cornelius Pings Professor of Biomedical Engineering and Professor of Ophthalmology, Biomedical Engineering, Cell and Neurobiology, Keck School of Medicine of USC and USC Viterbi School of Engineering, University of Southern California.

"The fact that many patients can use the Argus implant in their activities of daily living such as recognizing large letters, locating the position of objects, and more, has been beyond our wildest dreams, yet the promise to the patients is real and we expect it only to improve over time."

With approval from the FDA, the Argus II is slated to be available later this year in clinical centres across the country. Second Sight will be actively adding sites to make the therapy more readily available and encourages interested facilities and patients to contact them.

"This is an exciting time for people who are blind from RP. Second Sight's prosthetic retinal device brings meaningful hope to tens of thousands of people with advanced retinal diseases," said Stephen Rose PhD, chief research officer at Foundation Fighting Blindness. He adds, "The Argus II has the potential to provide life-changing vision capabilities as well as increased mobility and independence."

FDA approval came following more than 20 years of work in the field, two clinical trials, over \$100 million in public investment by the National Eye Institute, the

Department of Energy, and the National Science Foundation, and an additional \$100 million in private investments.

About the Argus II System

The Argus II System works by converting video images captured by a miniature camera housed in the patient's glasses into a series of small electrical pulses that are transmitted wirelessly to an array of electrodes on the surface of the retina. These pulses are intended to stimulate the retina's remaining cells resulting in the corresponding perception of patterns of light in the brain. The patient then learns to interpret these visual patterns thereby regaining some visual function.

Second Sight gained European approval (CE Mark) for the system in 2011 and FDA approval in 2013. It remains the first and only approved retinal prosthesis anywhere in the world.

Australian Scientists Planning to Bypass The Eye

The Monash Vision Group (MVG) is an alliance of researchers and private enterprise that is in the early stages of developing a direct-to-brain "bionic eye" with the help of Australian Government funding.

Users will wear a tiny camera mounted on a pair of glasses. A pocket processor will extract important information from the camera's images, which will be transmitted wirelessly to microchips implanted on the surface of the brain. Electrodes on the microchips will stimulate neurons, producing an image in the brain's primary visual cortex. Researchers believe the signal will be good enough to allow a user to navigate, or read large print.

Professor Jeffrey Rosenfeld is a Professor of Surgery at Monash University and Director of Neurosurgery at Melbourne's Alfred Hospital. He hopes the technology will do for blind people what the cochlear implant has done for the deaf. "The Cochlear device has been incredibly successful," he says. "What I'd like to see in the next 10 to 20 years is bionic vision devices giving the equivalent back in terms of vision recovery.

Rosenfeld is confident the MVG team is on the right track. Two years into the four-year project, successful prototype tests have been conducted on the microchips that will be implanted in the brain. "We plan to insert the first device into humans in the first half of 2014," Rosenfeld says. "The program is developing very nicely."

Other research groups around the world are also working on similar projects. While many researchers are implanting devices in the retina however, the MVG is one of few teams looking at implanting electrodes directly into the brain. This opens up the technology to people whose retinas, optic nerves or visual pathways are too damaged for a retinal implant. It is a point of difference that Arthur Lowery, Director at MVG, believes is important. "We're bypassing the first bit of the human vision system," he says. The group say that the direct-to-brain system could help people with a variety of conditions, not just RP.

MVG's four-year program is co-funded by an \$8 million Australian Government grant through the Australian Research Council, part of a \$50 million investment. "There are around 60 people involved," said Lowery. "There are academics, physiologists,

mathematicians, materials engineers, electrical engineers, robotics vision people, brain surgeons, medical imaging specialists and people looking for patients and evaluating whether the device may be suitable for them.”

From a medical point of view, Rosenfeld says the big test is yet to come: safely attaching the implant to the brain. Implants are already used for the treatment of conditions such as Parkinson’s disease, depression and obsessive-compulsive disorder. But those devices are relatively simple, containing just a few electrodes. The MVG implant consists of a grid of about 14 or so tiles, each of which comprises a four-by-four-millimetre microchip with 500,000 transistors and 45 hair-thin electrodes. Altogether, about 650 electrodes will be protruding from the device.

David Head, Chief Executive at the UK’s RP Fighting Blindness, said: “As ever it’s exciting to read about such innovative work and yet another line of research, even at this very early stage, that might benefit patients with RP. MVG’s own 10-20 year time frame for developing useful devices appears to be pragmatic and ties in with our own advisors views.”

LAST WORD

***The future depends on what we do in the present.
You must be the change you want to see in the world.***

MAHATMA GANDHI, 1869 - 1948

ABOUT US

Retina Australia (ACT) Inc. is a member of the national body, Retina Australia (RA). Other members of RA are Retina Australia (NSW), Retina Australia (VIC) – which incorporates activities in Tasmania – Retina Australia (QLD), Retina Australia (SA) and Retina Australia (WA). There is also a newly formed group in the Northern Territory.

Our role, and that of our fellow organisations, is to provide information and support to people and families affected by Retinitis Pigmentosa and other retinal dystrophies. We also raise funds for scientific research into the causes and prevention of these dystrophies.

Retina Australia is a member of Retina International, which has members and affiliates in more than 50 countries. It is estimated that more than 20 million people worldwide are affected by some form of retinal dystrophy.



Mission Statement: To provide information and support to people and families affected by inherited retinal dystrophies, and, with the support of the Australian community, to raise funds to finance scientific research into the causes, prevention and cure of retinitis pigmentosa.

Ways You Can Help Retina Australia (ACT)

There are many ways you can help and support us. Listed below are some suggestions.

1. Suggest to family and friends that they hold a special event (such as a sponsored walk or fundraising dinner) to support our work.
2. Include a reference to us when updating your Will.
3. Continue with your much-appreciated cash donations.
4. Tell your local eye professionals (and your family and friends) if you have found the information provided by Retina Australia (ACT) and its support services useful.
5. Offer your services to a member of the executive as there are numerous small jobs that need to be done. Many of these do not require you to be on a committee.
6. If approached, consider allowing your medical information and DNA to be stored on the inherited retinal diseases database so it is readily available to eye researchers both here and overseas.
7. When you hear that someone in your community has been diagnosed with sight loss tell them about Retina Australia (ACT) and the support services offered.

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