

Retinal Rejuvenation Therapy

| ELLEX 2RT MEDIA KIT |



Ellex Retinal Rejuvenation Therapy (Ellex 2RT™) is a breakthrough laser therapy which has the potential to positively influence the lives of millions of people suffering from retinal disease.

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Introduction

This kit provides information regarding Ellex Retinal Rejuvenation Therapy (Ellex 2RT™), a revolutionary new laser therapy developed by Ellex Medical Lasers Ltd. (www.ellex.com).

Ellex 2RT™ is a non-thermal, nanosecond laser therapy that stimulates a natural, biological healing response in the eye to treat a range of degenerative retinal diseases, and is currently undergoing clinical trial for the treatment of **Age-Related Macular Degeneration (AMD) and Diabetic Retinopathy** - two of the most common causes of vision loss and blindness in the developed world¹.

AMD is the most common cause of blindness in industrialized countries, and its global prevalence is expected to increase significantly due to ageing demographics. In Australia, AMD is the leading cause of blindness, affecting one in seven people over the age of 50 in its early stages². The U.S. National Eye Institute estimates that there are 1.8 million people with AMD in the United States, and that this number will grow to 3 million by 2020³. The economic impact and cost of AMD is high, and is estimated to directly cost the Australian community more than AU\$2.6 billion annually⁴. Worldwide, AMD costs US\$343 billion, including US\$255 billion in direct health care costs⁵.

Current treatment options for AMD only address advanced or end-stage complications associated with the disease. In contrast, early clinical results demonstrate that Ellex 2RT™ offers the potential to apply treatment earlier in the disease process,

before significant vision loss has occurred, with the aim of slowing or reversing the process of degeneration - offering a major breakthrough in treatment strategy.

At least 171 million people worldwide have diabetes, and this figure is expected to reach 366 million by the year 2030⁶. In Australia, the prevalence of diabetes has more than doubled since 1981, now affecting 8 percent and 6.8 percent of the adult male and female population respectively⁷. Overall, between 25-44 percent of people suffering from diabetes develop some form of Diabetic Retinopathy⁸. Diabetic Retinopathy is a progressive disease which, if left untreated, can cause visual impairment and blindness. So acute is the problem that Diabetic Retinopathy is now included on the World Health Organization's (WHO) priority list of diseases⁹.

Ellex 2RT™ shows great promise for the treatment of Diabetic Macular Edema (DME), which is the most common form of Diabetic Retinopathy. Early clinical results indicate that Ellex 2RT™ achieves a similar therapeutic benefit as compared to conventional thermal **retinal photocoagulation** laser treatment, but without the collateral damage associated with thermal photocoagulation.

For further information on Ellex 2RT™ please contact Kate Hunt, Ellex Corporate Communications Manager, at khunt@ellex.com or +61 8 8104 5214.

What is Ellex 2RT?

Ellex Retinal Rejuvenation Therapy (Ellex 2RT™) represents the newest in a series of advancements in retinal treatment. It is a non-thermal, nanosecond laser therapy that stimulates a natural, biological healing response in the eye to treat a range of degenerative retinal diseases.

Until now, laser therapies for the treatment of retinal disease have targeted late-stage complications, and have often focused on preserving central vision at the expense of compromised peripheral vision. This is because treatment strategy has previously relied on sacrificing the peripheral retina in order to preserve those areas of the retina responsible for central vision. But with the advancement of Ellex 2RT™, ophthalmologists have the potential to treat retinal diseases much earlier – halting disease progression and preserving functional vision before irreversible physical damage and vision loss occurs.

Ellex 2RT™ uses extremely short pulses of nanosecond laser energy to stimulate the **retinal pigment epithelium (RPE)**, triggering a process of cellular rejuvenation. This breakthrough approach retains the therapeutic effect of laser therapy whilst eliminating the thermal tissue damage inherent in conventional **retinal photocoagulation** laser treatment. Furthermore, Ellex 2RT™ is painless for the patient, faster for the ophthalmologist to administer, and eliminates the risk of damage to the **retina**.

Ellex Retinal Rejuvenation Therapy (Ellex 2RT™) is a non-thermal laser therapy that stimulates a natural healing response in the eye. It is designed to treat a range of retinal diseases, including Age-Related Macular Degeneration and Diabetic Retinopathy. Ellex 2RT™ offers the potential to treat earlier in the disease process, before significant vision loss has occurred.

What Does Ellex 2RT Treat?

Ellex 2RT™ is designed to treat a range of degenerative retinal diseases. Clinical results to date show promise for the treatment of **Age-Related Macular Degeneration** and **Diabetic Retinopathy**.

Age-Related Macular Degeneration

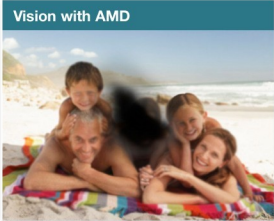
Age-Related Macular Degeneration (AMD) causes irreversible central vision loss and is the leading cause of blindness for people over the age of 50¹⁰. When AMD occurs it is categorized into dry or wet forms:

- The most common form, **Dry AMD**, is associated with changes that lead to atrophic cell death of the central **retina** or **macula**, which is essential for the fine vision used for activities like reading and driving etc.
- The wet form, **Wet AMD**, is caused by growth of abnormal blood vessels under the macula (known as **choroidal neovascularization**, or **CNV**). These abnormal blood vessels are of poor quality and leak fluid and blood, causing scar tissue that destroys the central retina. Over time this causes significant, progressive deterioration of vision and usually results in legal blindness within 1-2 years.

While there is currently no treatment for Dry AMD, the more aggressive wet form of AMD can be stabilized with intraocular injections of drugs, **anti-VEGF treatment**. The goal of anti-VEGF treatment is to stop the growth of the abnormal blood vessels (CNV), hence slowing vision loss. These drugs are expensive, invasive for the patient and not without risk. In addition, the intraocular injections must be continued, at this point in time, for the rest of the

patient's life. All FDA-approved AMD treatments today are only suitable for advanced or end-stage disease, and simply address complications associated with AMD.

In contrast, Ellex 2RT™ offers the potential to intervene much earlier and to slow or partially reverse the degenerative processes of the disease, thereby eliminating or delaying the risk of late vision-threatening complications associated with AMD.



What Does Ellex 2RT Treat? continued

Diabetic Retinopathy

Changes in lifestyle and diet, and increases in obesity and life expectancy rates have led to an increased incidence of vision-threatening diabetic eye disease, **Diabetic Retinopathy**. So acute is the problem that Diabetic Retinopathy is now included on the World Health Organization's (WHO) priority list of diseases¹¹.

Diabetic Retinopathy is caused by changes in the blood vessels of the **retina**. These damaged abnormal blood vessels can cause vision loss in two ways:

- Fragile, abnormal blood vessels grow into the jelly (vitreous) inside the eye. These blood vessels can break and bleed inside the eye, triggering further progressive damage and, if left untreated, profound blindness. This is called Proliferative Retinopathy and is the most advanced stage of the disease.
- Fluid can leak into the center of the **macula**, the part of the eye where sharp, straight-ahead vision occurs. This fluid makes the macula swell, blurring vision. This condition is called Macular Edema. It can occur at any stage of Diabetic Retinopathy, although it is more likely to occur as the disease progresses. Over time vision is lost and the changes become irreversible.

Currently, thermal **retinal photocoagulation** is the standard treatment for controlling Diabetic Macular Edema and Proliferative Retinopathy. However, thermal retinal photocoagulation causes irreversible collateral damage to retinal tissue, which is currently accepted as a tradeoff for the prevention of blindness. Furthermore, thermal retinal photocoagulation is often painful for the patient as it involves high levels of laser energy.

In early pilot clinical trials Ellex 2RT™ has been shown to be as effective as conventional thermal retinal photocoagulation, but offers the additional benefit of sparing the **photoreceptors**, and therefore the retinal function, of thermal damage. In addition, Ellex 2RT™ is painless and quick to perform, offering considerable advantage to both patient and doctor.



Ellex 2RT Technology

The Mechanism of Ellex 2RT

Ellex 2RT™ is designed to treat a range of retinal diseases caused by a compromised **retinal pigment epithelium (RPE)** and **Bruch's membrane**, the structures responsible for transporting the energy supply to, and removing the waste from, the retinal **photoreceptors**. Ellex 2RT™ stimulates a biological healing process that results in cellular rejuvenation, reversing these impaired transport mechanisms. Laboratory studies undertaken by Professor John Marshall, PhD, FRCPATH, FRCOphth (Hon), at St. Thomas' Hospital, London, UK, demonstrated that Ellex 2RT™ rejuvenates the entire transport mechanism of the **retina** and improves the hydraulic conductivity of Bruch's membrane.

This process of rejuvenation preserves or improves functional vision and reduces disease progression – without causing collateral damage to the overlying photoreceptor rods and cones of the retina. In the case of **AMD**, Ellex 2RT™ can be applied early in the disease process with the aim of preventing **neovascularization (CNV)** and slowing or partially reversing the degradation that can lead to late blinding **Dry** and **Wet AMD**.

Nanosecond Laser Technology

Ellex 2RT™ utilizes an ultra-fast nanosecond laser pulse – uniquely different to existing retinal laser treatments.

In order to induce a therapeutic effect without the permanent collateral damage caused by conventional thermal **retinal photocoagulation**, Ellex 2RT™ utilizes unique, solid-state, nanosecond laser technology. This patented technology allows the precise and specific delivery of laser energy to nano-sized targets within the cellular structure of the ageing RPE cells – without causing thermal destruction of the retina.

In order to illustrate how Ellex 2RT™ nanosecond laser technology differs from existing retinal laser treatments, consider the following: if the nanosecond laser pulse of Ellex 2RT™ is represented on a distance scale, with one laser pulse represented by a distance of 3 centimeters, the thermal laser pulse of conventional retinal photocoagulation would be represented by a distance of 1,000 kilometers.

Ellex 2RT Technology continued

Ellex 2RT Compared to Conventional Photocoagulation Treatment

Thermal **retinal photocoagulation** is currently considered to be an effective treatment for retinal disease. However, unlike conventional photocoagulation treatment, Ellex 2RT™ eliminates the thermal collateral damage caused to the **retina**.

There are several key differences between conventional retinal photocoagulation and Ellex 2RT™, including:

- Instead of using millisecond or microsecond treatment times, Ellex 2RT™ uses extremely fast nanosecond pulses.
- Each laser pulse of Ellex 2RT™ delivers a 400 micron diameter beam, comprised of hundreds of individual micron-sized energy packets. This ensures controlled and even energy delivery. In contrast, conventional thermal retinal photocoagulation laser treatment commonly delivers a smaller spot size. As both treatments involve the application of laser shots over a large grid area, treatment with Ellex 2RT™ is much faster to perform.
- Ellex 2RT™ is non-thermal, eliminating damage to the **photoreceptors**. Conventional retinal photocoagulation destroys the very retinal cells that are responsible for vision: the photoreceptor cells.

Ellex 2RT Compared to Micropulse Laser Technology and SRT

In recent years, micropulse laser technology and SRT (Selective Retinal Therapy), have emerged as possible alternatives to retinal photocoagulation for the treatment of retinal disease. Both treatments use considerably faster laser pulses than conventional retinal photocoagulation, but still inflict thermal damage to the retina. In contrast, Ellex 2RT™ uses nanosecond pulses of laser energy – delivering 500 times less energy, and without the risk of thermal damage.

There are several key differences between micropulse laser technology and Ellex 2RT™, including:

- Micropulse lasers and SRT use a train of microsecond laser pulses, which cannot avoid thermal damage. In contrast, Ellex 2RT™ uses extremely fast nanosecond pulses that do not cause thermal damage.
- Early clinical results for Ellex 2RT™ show promise in the treatment of **AMD**, whereas neither SRT or micropulse laser technology have demonstrated efficacy in the treatment of AMD.

Ellex 2RT IP Pathway

Intellectual Property Status

Ellex 2RT™ technology is protected by several international patents. Ellex has also secured a sublicense to the retinal aspects of Patent No. 5,549,596 ("Selective Laser Targeting of Pigmented Ocular Cells"), developed by Massachusetts General Hospital (www.mgh.harvard.edu).

Regulatory Status

Ellex will secure key regulatory approvals for the Ellex 2RT™ product range in all major markets over the coming years:

- Inclusion on the Therapeutic Goods Administration (TGA) ARTG, Australia, is planned for 2011.
- CE Mark, European Union, is planned for 2011.
- Food and Drugs Administration (FDA), U.S., is planned for 2012.

Ellex 2RT Research

Laboratory Research

Ellex has undertaken extensive laboratory investigations to establish the therapeutic effect and safety profile of Ellex 2RT™, and to determine its mechanism of action.

Research conducted at St. Thomas' Hospital, London, UK, demonstrated that Ellex 2RT™ influences the transport properties of the **RPE** and **Bruch's membrane** – key structures involved in the progression of **AMD** and **Diabetic Retinopathy**.

A summary of the laboratory research abstracts for Ellex 2RT™ is included below:

1. Nanosecond Pulse Lasers for Retinal Applications. Lasers in Surgery and Medicine 43:499–510 (2011). J. Wood, M. Plunkett, V. Previn, G. Chidlow, R. Casson.

2. 1Upregulation of MMP-2 and MMP-9 Release by Human RPE Cells Mediates Bruch's Membrane Permeability. J. Zhang, A. Hussain, Y. Sun, J. Marshall. Institute of Ophthalmology, London, United Kingdom. ARVO 2010.

3. Laser-Mediated Activation of Matrix Metalloproteases (MMPs) Leading to Increased Transport Across Ageing Bruch's Membrane: Implications for Treatment of ARMD A. El-Osta. Academic Department of Ophthalmology, St Thomas' Hospital, London, United Kingdom. ARVO 2010.

4. Retinal Damage Profiles and Cellular Responses to Laser Treatment: Comparison Between a Novel, Non-Thermal Laser and a Conventional Photocoagulator. G. Chidlow, J.P.M. Wood, R.J. Casson, M. Plunkett. Ophthalmic Research Laboratories, Royal Adelaide Hospital, Adelaide, Australia; Ellex R&D Pty Ltd, Adelaide, Australia. ARVO 2009.

5. Effect of Sub-Threshold Laser Energy (Ellex 2RT) on the Matrix Metalloproteinase (MMP) Release Profile of RPE and the Diffusional Status of Underlying Bruch's Membrane. J. Zhang, Y. Sun, A. Hussain, J. Marshall. Ophthalmology, Rayne Inst, St Thomas Hosp, London, United Kingdom; Ophthalmology, Ruijin Hospital, Shanghai Jiao Tong University, Shanghai, China. ARVO 2009.

6. Treatment of Diabetic Macular Oedema With a New Laser System 2RT (photoregeneration). Hamilton, L. Pelosini, R. Hamilton, M. Mohamed, J. Marshall. London, United Kingdom; Ophthalmology, St Thomas' Hospital, London, United Kingdom. ARVO 2008.

7. Hydrodynamic Status of Bruch's Membrane in Age-Related Macular Degeneration (AMD). A.A. Hussain, J. Marshall. Ophthalmology, St Thomas Hospital, The Rayne Institute, London, United Kingdom. ARVO 2008.

8. A RPE-19 Mediated Improvement in the Hydraulic Conductivity of Human Donor Bruch's Membrane. A.A. El-Osta, A.A. Hussain, J. Zhang, J. Marshall. The Rayne Institute, St. Thomas' Hospital, Academic Department of Ophthalmology, London, United Kingdom. ARVO 2008.

9. Sub-Threshold Q-Switched Laser (Ellex 2RT) - Induced Migration of Human RPE and Concomitant Release of Matrix Metalloproteinases (MMPs). J. Zhang, Y. Sun, A. Hussain, A. El-Osta, L. Pelosini, P. Hamilton, J. Marshall. Ophthalmology, Rayne Inst, St Thomas Hosp, London, United Kingdom. ARVO 2008.

10. Nanosecond Laser Pulses for Retinal Treatment. J.P. Wood, G. Chidlow, V. Previn, M. Plunkett, R. Casson. South Australian Institute of Ophthalmology, Ophthalmology, Royal Adelaide Hospital, Adelaide, Australia; Ellex R&D Pty Ltd, Adelaide, Australia. ARVO 2008.

Ellex 2RT Research continued

Clinical Research

Ellex has undertaken a series of randomized control trials in order to validate the safety and efficacy of Ellex 2RT™ in the treatment of **AMD** and **Diabetic Retinopathy**. These studies follow on from the 2008 clinical study conducted by Professor John Marshall, PhD, FRCPath, FRCOphth (Hon), which investigated the efficacy of Ellex 2RT™ in the treatment of Diabetic Maculopathy secondary to Diabetic Retinopathy.

A summary of these studies is included below:

2011 Early AMD Study Results

In May 2011, Ellex reported the interim 12 month clinical results for a prospective trial undertaken by Professor Robyn Guymer, MB, BS, PhD, FRANZCO, Head of Macular Research at the Centre for Eye Research Australia (CERA), investigating the efficacy of Ellex 2RT™ for treating patients with bilateral high-risk early AMD. The trial, which is being undertaken at the Victorian Eye and Ear Hospital over a 12-month follow up period, currently includes 24 patients at 12-months follow-up.

- At 12 months the majority of patients experienced improvement in visual function and drusen reduction.
- Central visual function improved in 64 percent of treated eyes.
- Visual function improved predominately in the regions of greatest dysfunction, which are associated with the highest likelihood of progressing to Wet AMD.
- Retinal imaging confirmed that there was no evidence of laser damage to photoreceptor cells.

According to Professor Robyn Guymer, "The initial results suggest that the application of Ellex 2RT to the affected eye eliminates the yellow deposits known as drusen which are present in the retinal tissue of people with AMD. By getting rid of the drusen from a patient's retina, we hope to reverse the degenerative processes caused by the disease."

2010 Diabetic Retinopathy Study Results

In May 2010, Ellex reported the completed 6-month clinical results for a trial undertaken by Associate Professor Robert Casson, MB, BS (Hons), DPhil, FRANZCO, comparing the efficacy of Ellex 2RT™ and **retinal photocoagulation** for the treatment of Diabetic Macular Edema (DME). The prospective trial, which is being conducted at the Royal Adelaide Hospital over a 12-month follow up period, currently includes 48 patients at 6-months follow-up.

At six months Ellex 2RT™ nanosecond laser treatment has produced very similar reductions in macular edema as compared to conventional retinal photocoagulation, whilst using approximately 500 times less laser energy and inducing no collateral damage.

2008 DME Study Results

In 2008, Ellex reported the six-month clinical results for a pilot study undertaken by Professor John Marshall, PhD, FRCPath, FRCOphth (Hon), investigating the efficacy of Ellex 2RT™ for treating diabetic maculopathy. The study, which was conducted at St. Thomas' Hospital, London, UK, involved 23 patients (38 eyes) with newly-diagnosed diabetic maculopathy. Seventeen patients (28 eyes) completed the six-month follow-up examination.

Ellex 2RT Research continued

- At six months the majority of patients experienced improvement in visual function and a reduction in central macular thickness¹.
- Central macular thickness decreased by more than 5 percent from baseline in 46 percent of patients, demonstrating an improvement in retinal function. Central macular thickness remained stable in 39 percent of patients and increased by more than 5 percent in only 15 percent of patients.
- The amount of hard exudates decreased in more than half of the treated eyes, demonstrating an improvement in retinal function and a partial reversal of disease progression.
- Central functional vision improved in 43 percent of eyes by two or more lines of **visual acuity**. 28 percent of eyes showed an improvement of one to two lines of visual acuity, while the visual acuity remained stable in 15 percent of eyes and deteriorated in 14 percent of eyes.

A summary of the clinical research abstracts for Ellex 2RT™ is included below:

1. Retinal Functional Improvement with Nano-Laser Treatment in High Risk Early Age-Related Macular Degeneration. Robyn H. Guymer, Kate Brassington, Peter N. Dimitrov, Mary Varsamidis, Galina Makeyeva, Khin Zaw Zung, Devinder Chauhan, Algis Vingrys, Chi Luu. ARVO 2011.
2. An Investigation on the Clinical Efficacy of the Ellex 2RT Laser for Treating Patients with Diabetic Maculopathy and AMD. John Marshall. SFO 2011.
3. Evaluation of the Clinical Efficacy of the Ellex 2RT Laser for the Treatment of Diabetic Maculopathy and AMD. John Marshall. Euretina 2011.
4. Novel Nanosecond Laser Treatment to Prevent Vision Loss From Age-Related Macular Degeneration. R.H. Guymer, K. Bassington, P.N.D. Dimitrov, A.J. Vingrys, M.J. Plunkett. ARVO 2010.
5. A Pilot, Prospective, Randomized Clinical Trial of a New Nanopulse Retinal Laser versus Conventional Photocoagulation for the Treatment of Diabetic Macular Edema. R.J. Casson, G. Raymond, H.S. Newlan, J. Gilhotra, T. Gray, J. Runciman, N. Jaross, M. Plunkett. ARVO 2010.
6. Treatment of Diabetic Macular oedema with a new laser system 2RT (photoregeneration). L. Pelosini, R. Hamilton, M. Mohamed, J. Marshall. ARVO 2008.

¹ An abnormal increase in central macular thickness is associated with retinal disease.

Ellex 2RT Research Partners

PRINCIPAL STUDY INVESTIGATORS

Professor John Marshall PhD, FRCPath, FRCOphth (Hon)

Professor John Marshall is an internationally recognized expert on laser and light bio-effects in the field of ophthalmology. He is Emeritus Professor of Ophthalmology at King's College London and an honorary distinguished Professor in Visual Science at the University of Cardiff. He is also honorary Professor of Ophthalmology in the Institute of Ophthalmology University College London. Professor Marshall is the co-inventor of the world's first diode laser for ophthalmology and the inventor of excimer laser technology for refractive surgery. During the past 30 years, his research has shed light on the mechanism underlying age-related, diabetic and inherited retinal disease, and on the development of lasers for use in ophthalmic diagnosis and surgery.

Professor Robyn Guymer MB, BS, PhD, FRANZCO

Professor Robyn Guymer, a retinal specialist, leads the Macular Research Unit at the Centre for Eye Research Australia (CERA). Professor Guymer completed her PhD at the Walter & Eliza Hall Institute of Medical Research and her ophthalmology training in Melbourne before completing a medical retinal fellowship at Moorfields Eye Hospital, London. In 1997, Professor Guymer began the genetic study of AMD and established the McComas molecular genetics laboratory. Her research team conducts clinical trials into the treatment of AMD and epidemiological studies into its risk factors, and has been responsible for introducing new treatments and investigative tools into clinical practice.

Associate Professor Robert Casson MB, BS (Hons), DPhil, FRANZCO

Dr. Robert Casson is the Associate Professor of Ophthalmology at the University of Adelaide and is a board member of the Ophthalmic Research Institute of Australia. He currently serves as the Director of Research in the Department of Ophthalmology, Royal Adelaide Hospital, and is the Director of the Ophthalmic Research Laboratories in the Hanson Institute, University of Adelaide. Dr. Casson completed his general ophthalmic training in Oxford, and undertook a fellowship at the Oxford Eye Hospital and at Moorfield's Eye Hospital, London. He was awarded a prestigious scholarship to undertake a DPhil at Oxford University in the Nuffield Laboratory of Ophthalmology, and was awarded the DPhil in May 2004. Dr. Casson has published over 100 peer-reviewed publications.

Dr. Erica Fletcher PhD

Dr. Erica Fletcher is a Senior Lecturer and Research Scientist in the Department of Anatomy and Cell Biology at the University of Melbourne, Victoria. Dr. Fletcher's research is primarily focused on the structure and function of the mammalian retina and how it changes during diabetes and retinal degeneration. Dr. Fletcher undertook her optometry training at the University of Melbourne before completing a Masters degree and PhD examining the pathogenesis of retinal degeneration. In 1996, she was awarded a highly coveted CJ Martin Award from the NH&MRC to undertake her post-doctoral training with Prof. Dr. Heinz Wässle, at the Max-Planck Institute for Brain Research in Frankfurt, and in 2006 was awarded the Irvin M and Beatrice Borish Award from the American Academy of

Ellex 2RT Research Partners continued

Optometry for her contribution to vision research.

Dr. Glyn Chidlow
BSc (Hons), DPhil

Dr. Chidlow is a senior post doctoral research scientist in the Ophthalmic Division of the Centre for Neurological Research in the Hanson Institute, University of Adelaide. He was recently appointed as a Senior Lecturer in the University's Department of Ophthalmology, and is recognized as a world-leading scientist in the field of ocular neuroprotection. Dr. Chidlow completed his undergraduate degree at Reading University and graduated with first class Honours in biochemistry and physiology in 1993. He subsequently undertook his DPhil in the Nuffield Laboratory of Ophthalmology at Oxford University under the supervision of Professor Neville Osborne. In 2000 he was awarded the prestigious St Cross College Knoop Junior Fellowship. Dr. Chidlow has published over 40 peer-reviewed ophthalmic and vision science-based publications, and is a reviewer for a number of journals, including Investigative Ophthalmology and Visual Science, Ophthalmic Research and Experimental Eye Research.

Dr. John Wood
BSc (Hons), DPhil

Dr. John Wood is a senior post doctoral research scientist in the Ophthalmic Division of the Centre for Neurological Research in the Hanson Institute, University of Adelaide, and is a Senior Lecturer in the University's Department of Ophthalmology. He is an expert in a wide range of molecular biological techniques, with particular expertise in cell culturing. Dr. Wood completed his undergraduate degree in Biochemistry at Bath University, graduating with

Honours in 1992. He subsequently completed a DPhil in the Nuffield Laboratory of Ophthalmology at Oxford University under the supervision of Professor Neville Osborne. He has produced over 50 publications, publishing 40 peer-reviewed ophthalmic-based manuscripts in the last 6 years.

OPHTHALMIC CONSULTANTS

Dr. Jim Runciman
FRACS, FRANZCO, FFAO

Dr. Jim Runciman is a fellow of the Royal Australian and New Zealand College of Ophthalmologists and the Royal Australasian College of Surgeons. Appointed to the Macular Degeneration Foundation Board in 2003, Dr. Runciman is a leading retinal ophthalmologist and currently serves as a principal of the Adelaide Eye & Retina Centre. He has been a Board member of the Royal Society for the Blind of SA since 1995 and previously served as the Society's President. Dr. Runciman is the State Chair for the Macular Degeneration Foundation in South Australia, and previously acted as a senior visiting consultant to the Royal Adelaide Hospital and the Queen Elizabeth Hospital, Adelaide. He is also a member of the Ophthalmic Medical Advisory Board of Novartis Australia.

If you would like to arrange an interview with a key Ellex 2RT™ research partner, please contact Kate Hunt, Ellex Corporate Communications Manager, at khunt@ellex.com or +61 8 8104 5214.

Ellex 2RT Research Partners continued

CLINICAL RESEARCH INSTITUTIONS

Royal Victorian Eye & Ear Hospital Melbourne, Australia

The Royal Victorian Eye & Ear Hospital is one of Victoria's largest hospitals in terms of patient appointments. It undertakes half of the State's public general eye surgery, up to 90% of special eye surgery, and almost all of Victoria's public cochlear implant surgery. Since its beginnings in 1863, when the Hospital was an infirmary treating diseases of the eye and ear amongst Melbourne's poor, the Hospital has grown in size and reputation.

As a world leader in eye, ear, nose and throat services, the Hospital is now at the cutting edge of research and teaching. This is supported through its close association with the University of Melbourne Departments of Ophthalmology and Otolaryngology which are co-located with the Hospital.

Centre for Eye Research Australia Melbourne, Australia

The Centre for Eye Research Australia (CERA) is Australia's leading research institute, dedicated to eliminating the major eye diseases that cause vision loss and blindness and reducing their impact on the community. CERA's comprehensive research program incorporates clinical, genetic and laboratory research into eye disease. Its population health research focuses on improving support and rehabilitation for people with vision loss.

CERA is a designated World Health Organisation Collaborating Centre for the Prevention of Blindness – the only such centre in Australia. It is affiliated with the University of Melbourne and the Royal Victorian Eye and Ear Hospital, where it is located.

Guy's and St Thomas' and King's College London, UK

Guy's and St Thomas' provides around 850,000 patient contacts in acute and specialist hospital services every year. As one of the biggest NHS Trusts in the UK, it employs around 10,000 staff. The Trust works in partnership with the Schools of Medicine, Dentistry, Nursing and Biomedical Sciences of King's College London and other Higher Education Institutes to deliver high quality education and research.

King's College London is one of the top 25 universities in the world (Times Higher Education 2009) and the fourth oldest in England. A research-led university based in the heart of London, King's has more than 21,000 students from nearly 140 countries, and more than 5,700 employees.

Royal Adelaide Hospital Adelaide, Australia

The Royal Adelaide Hospital (RAH) is South Australia's largest accredited teaching hospital, providing the people of South Australia (and nearby states and territories) with outstanding medical care and rehabilitation.

Since it was founded in 1840, the RAH has built an international reputation as one of Australia's finest public teaching hospitals. The hospital offers basic training positions in internal medicine, surgery and general practice, as well as advanced training in a range of specialty areas. Staff at the hospital are actively involved in cutting edge research, making the RAH a centre for both medical and research excellence.

Ellex 2RT Research Partners continued

**South Australian Institute of Ophthalmology
(The University of Adelaide)
Adelaide, Australia**

The South Australian Institute of Ophthalmology (SAIO) is a centre of excellence in eye care in Australia and incorporates all ophthalmic subspecialty services via its clinical arm the Central Northern Ophthalmic Network (CNON). The network encompasses the Departments of Ophthalmology & Visual Sciences at the Royal Adelaide, The Queen Elizabeth and Lyell McEwin Hospitals.

The Institute is responsible for a vigorous ophthalmic research program which incorporates clinical, basic science and epidemiological research divisions. The SAIO also runs several international outreach programs including the Vision Myanmar Program and regularly conducts WHO workshops in several countries.

LABORATORY RESEARCH INSTITUTIONS

**Guy's and St Thomas' and King's College
London, UK**

Guy's and St Thomas' provides around 850,000 patient contacts in acute and specialist hospital services every year. As one of the biggest NHS Trusts in the UK, it employs around 10,000 staff. The Trust works in partnership with the Schools of Medicine, Dentistry, Nursing and Biomedical Sciences of King's College London and other Higher Education Institutes to deliver high quality education and research.

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**The University of Melbourne
(Department of Ophthalmology)
Melbourne, Australia**

The University of Melbourne was the first in Australia to establish a specialist ophthalmology chair - the Ringland Anderson Chair of Ophthalmology in 1958.

The Department of Ophthalmology together with the Royal Victorian Eye and Ear Hospital where it is based has been a partner in the Lions Eye Bank Melbourne (now: Lions Eye Donation Service) since the 1980s and was in 1992 designated a World Health Organisation Collaborating Centre for the Prevention of Blindness.

Ellex 2RT Research Partners continued

**South Australian Institute of Ophthalmology
(The University of Adelaide)
Adelaide, Australia**

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Glossary of Terms

Anti-VEGF Treatment.

Anti vascular endothelial growth factor medications (Anti-VEGFs) are substances that stop abnormal blood vessels from forming or growing. Anti-VEGFs refer to a category of drugs which work by targeting a protein (VEGF) that is essential for the formation and growth of new blood vessels. Blocking VEGF can reduce or halt the growth of new blood vessels which are the critical component of blinding Wet AMD.

Age-Related Macular Degeneration (AMD).

A degenerative retinal disease characterized by a loss of function in the macula, the critical part of the retina responsible for acute central vision and the ability to see fine details.

Bruch's Membrane.

The membrane which separates the photoreceptor cells (rods and cones) and retinal pigment epithelium from the rich blood vessels of the choroid on which they rely for support.

Choroid.

Vascular (major blood vessel) layer of the eye lying between the retina and the sclera. Provides nourishment to outer layers of the retina.

Diabetic Macular Edema (DME).

Swelling of the critical, central retina in people with diabetes due to the leaking of fluid from blood vessels within the macula. Swelling results in progressive degradation of fine, detailed vision. Changes are usually progressive and eventually become irreversible.

Diabetic Retinopathy.

A term used for all the abnormalities of the small blood vessels of the retina that are caused by diabetes. If untreated over the long-term, diabetic retinopathy can result in blindness.

Drusen.

White or yellow waste deposits on Bruch's membrane (of the retinal pigment epithelium). Common after age 60. Large macular drusen are the hallmark of AMD.

Dry Age-Related Macular Degeneration (AMD).

The more common and milder form of AMD, which accounts for 85 to 90 percent of all cases. Dry AMD occurs when the light-sensitive cells in the macula slowly break down, gradually blurring central vision in the affected eye. One of the earliest signs of Dry AMD is the build-up of drusen, or yellow deposits, under the retina. Currently, there are no treatment options available for Dry AMD. In approximately 10 to 15 percent of patients, these changes progress to the more rapid form of Wet AMD.

Ellex 2RT.

Ellex Retinal Rejuvenation Therapy (Ellex 2RT™) is non-thermal laser therapy that stimulates a natural healing response in the eye. It is designed to treat a range of retinal diseases, including Age-Related Macular Degeneration and Diabetic Retinopathy. Ellex 2RT™ offers the potential to treat earlier in the disease process, before significant vision loss has occurred.

Macula.

The small, critical central area of the retina responsible for acute, detailed central vision.

Neovascularization (CNV).

Formation of abnormal, new blood vessels, usually in or under the retina. The cells are not at all beneficial, and generally give rise to blinding complications.

Glossary of Terms continued

Photoreceptors.

The rods and cones of the retina responsible for converting light images into nerve signals; critical for vision.

Retina.

Light-sensitive nerve tissue in the eye that converts light images from the eye's optical system into electrical impulses that are processed and sent along the optic nerve to the brain.

Retinal Photocoagulation.

The denaturing of retinal tissue through the application of heat energy to cause irreversible damage.

Retinal Pigment Epithelium (RPE).

The metabolically-active mono-layer of cells beneath the photoreceptors (rods and cones) responsible for maintaining and nourishing the retina.

Visual acuity.

Assessment of the eye's ability to distinguish object details and shape, using the smallest identifiable separation of two objects that can be seen at a specified distance.

Wet Age-Related Macular Degeneration

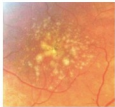
(AMD). A form of advanced AMD that develops when abnormal blood vessels grow into the macula, causing leakage and damage which results in the loss of central vision. Once it commences, Wet AMD usually follows a relentless, progressive course resulting in legal blindness for the majority of sufferers. Although it represents only 10 to 15 percent of overall AMD prevalence, Wet AMD is responsible for more than 80 percent of cases of severe vision loss in people with AMD.

Sources:

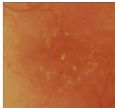
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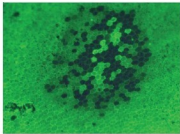
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Pre-2RT: Extensive Drusen
Figure 1: The pre-treatment retina showing extensive drusen, i.e. yellowish spots that form in the retina which are an early sign of Dry AMD.
(Ellex2RT_AMD_drusen.jpg).



Post-2RT: Drusen Reduction
Figure 2: Post-treatment retina showing drusen reduction.
(Ellex2RT_AMD_drusen reduction.jpg)



Porcine RPE Following 2RT Laser Treatment
Calcein-AM used to visualize living RPE cells (green) and dead RPE cells (black) following treatment with Ellex 2RT; cell membranes are not ruptured and no collateral damage is caused to photoreceptors.
(Ellex2RT_porcine.jpg)



Retinal Rejuvenation Therapy
Ellex 2RT is applied to the RPE, targeting the melanin cells, and produces a regenerative healing effect. This process of cellular rejuvenation improves retinal function and reverses the degenerative processes which lead to retinal disease.
(Ellex2RT.jpg)



Professor Robyn Guymer, Head of Macular Research at the Centre for Eye Research Australia, prepares a patient for treatment with a prototype Ellex 2RT system, (clinical trial at Royal Victorian Eye and Ear Hospital).
(Ellex2RT_Guymer.jpg)

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