

Dear friends and supporters

Welcome to our first newsletter of 2021. Excitingly, despite a year of lockdown, our vision research group has achieved significant success in papers being published by prestigious research journals such as *Nature Communications* and *Cells*. These papers include work describing 127 new genes that cause glaucoma and collaborating with colleagues to show that air pollution can cause macular degeneration. The work highlighting the link between air pollution and the risk of macular degeneration was featured on the front page of *The Guardian*.



The human stem cell work has moved to the new laboratory space and I look forward to sharing an update from Dr Jorn Lakowski in the next newsletter. My heartfelt and grateful thanks to Mr Jeff Smith for his generosity in funding this facility for our team.

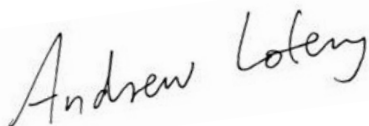
The Wellcome Trust study, mentioned in our last newsletter, will help us understand what causes patients to progress to the more serious late stages of macular degeneration. It is to be hoped that, in time, some preventative therapies will be developed for the benefit of patients. We are excited that we have recruited almost 50 patients to this important research project and analysed over 500,000 retinal scans using the power of computers. Our goal is to revolutionise the treatment of this devastating disease.

My colleague, Parwez Hossain, who sees patients in the corneal and front-of-eye clinics in Southampton Eye Unit has published a paper describing how patients suffering from dry eye disease symptoms have a lower quality of life compared to those without symptoms. 47% of participants felt that it impacted on their ability to carry out daily activities and on their work productivity. This is a very common condition and clinical studies of this kind are informative for clinicians and patients alike.

I am delighted to report that the University of Southampton Events team are organising our bi-annual 'Beating Blindness' Lecture which will be held on-line on Thursday 27 May from 18.00 – 19.00. Details are given on the back page of this newsletter and I hope many of you will join us.

It will be good to see an end to some of the restrictions caused by the pandemic but I feel we shall all be taking great care for some time to come. In the meantime please stay safe and well and do let us know if you have any questions relating to our research.

With my very best wishes.

A handwritten signature in black ink that reads "Andrew Lotery".

Andrew Lotery MD, FRCOphth  
Professor of Ophthalmology  
University of Southampton

## MEMORY DONATIONS 2020

*We send our warmest thanks to all who commemorated loved ones by sending Memory donations to help our research. We remember the following people who sadly left us in 2020:*

Barbara Austin • Mr Ken Ball • Mr Rodney Bickley • Mr Anthony Chennells • Mr Ken Chopping •  
Rev. John Clarke • Mr Charles Cruse • Mrs Mahala (Micky) Curtis • Mrs Betty Davis •  
Mr DickKnight • Mrs Maria Kyprian • Mr Richard Lawes • Mrs Rene Matravers •  
Mrs Matilda McKinty • Mr John Petrony • Mr Philip Round • Mrs Inger Ruffell • Mr Peter Ward •

### **Dr Arjuna Ratnayaka Lecturer in Vision Sciences**

The restricted access to University laboratories has presented everyone with considerable difficulties during the pandemic. However, I am delighted to say that my team has risen admirably to this challenge by maximising the limited time allowed in labs and working effectively from home. As a team we have stayed closely connected throughout the pandemic with virtual weekly group and project-specific meetings. Our collective efforts have led to multiple research awards as well as several important discoveries that were published back-to-back in prominent scientific journals.



Dr Arjuna Ratnayaka

In August 2020, I was awarded a PhD studentship from the Macular Society to study whether lysosomes (the waste disposal system in cells) can be boosted to rejuvenate damaged retinal pigment epithelial (RPE) cells as a novel treatment for dry AMD. I am delighted to welcome Rebecca Miller to the group to undertake this exciting 3-year project. I am also pleased to report that our expertise in studying how cells become damaged with age and retinopathy has led to investment by a US drug discovery company to start a new pre-clinical project in Southampton from March 2021. In January of this year, myself and a member of my group (Dr Jenny Dewing) were awarded a UK government funded Public Policy grant. This project aims to increase the public awareness of blinding diseases and help increase investment into ground-breaking discoveries to prevent and treat sight-loss. This study will help us understand why funding is relatively low for research into blinding diseases in the UK, and I am delighted that Gift of Sight is a project partner in this endeavour. The importance of embedding evidence-based science in government policy is currently making headlines, as shown by the UK response to the COVID pandemic.

In new research findings published during the past year, we showed how novel imaging technology can be used to study retinal tissues in three-dimensional space. We were the first to fully reconstruct [Retinal Pigment Epithelium \(RPE\) cells in 3D](#), enabling a new understanding of their organisation. In another article, we showed how a retinal pigment epithelium cell model in a dish can be used to mimic the accumulation of incompletely degraded photoreceptor outer segments termed 'lipofuscin' in patients diagnosed with age-related macular degeneration (AMD). Our model is a useful tool to study the pathology linked with lipofuscin, as it also mimics RPE autofluorescence, which is measured as a clinical end-point in patients. In a separate study published in February 2021, we showed how [Amyloid-beta proteins](#) that accumulate in aged and AMD retinas can damage RPE cells, revealing an entirely new disease-pathway that can potentially be targeted as a novel treatment. These studies, which were the collaborative efforts of talented early career researchers, were supported by Gift of Sight. Support through donations, particularly during this time when there are significant shortfalls for important research, will enable us to continue our endeavours for the benefit of patients. I would therefore like to thank everyone supporting the Gift of Sight Appeal.

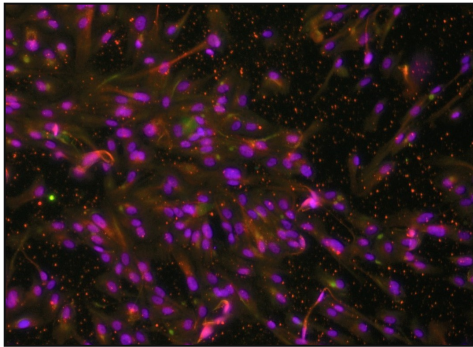
## How your donations have helped our scientists

An increase in the number of scientists in the vision science laboratories revealed the need for a new microscope, capable of speeding up experiments to obtain informative and reliable data.

Your philanthropic donations enabled us to purchase a new EVOS microscope which will be used by postdoctoral and PhD students in the vision research group. The microscope is expected to provide years of reliable service, allowing enhanced imaging capabilities to all staff who use this cell culture facility.



Drs Ellie Keeling and Jenny Dewing with the new EVOS microscope



For those of you who like to 'see' the science, this image shows Retinal Pigment Epithelium (RPE) cells expressing a mutant form of the TIMP3 gene (red), green fluorescent protein (green) with cell nuclei in blue. Mutations in TIMP3 cause the rare macula disease Sorsbys Fundus Dystrophy. Growing the cells on a polycarbonate membrane allows them to become structurally and functionally specialised which means they behave more like the RPE cells in the human eye.

We will be looking to add the purchase of an incubator that fits to the side of the microscope, meaning that time-lapse images of live-cell cultures can be captured. A 4x strength magnification objective will produce very high-resolution fluorescent images of cells with a wider field of view to help us investigate how cells migrate, as well as image eye organoids in culture.

A Cy5 light cube is also on our 'shopping list'. This will allow our scientists to image a much greater range of fluorescent dyes. When combining this with current light cubes, staining can be obtained for multiple cellular components which will greatly reduce the time taken to perform experiments.

## Gifts for Children's Eye Research

We are hugely grateful to The Hendy Foundation who donated funds to purchase two iPads for use in our paediatric CHEETAH study (Children's Eye Examination and Test At Home). We also very much appreciate the help from ExxonMobil Fawley and Mr & Mrs Christopher Saunders-Davies for their gifts which allowed us to buy two more iPads for the project. As well as providing data for the study, the iPads allow us to reduce the number of outpatient clinic assessments the patients have to attend, causing less disruption to their schooling.



A young Amblyopia patient

This generosity has been a huge help to research orthoptist, Dan Osborne, and the clinical team in Southampton Eye Unit who are endeavouring to maximise the benefits of home testing for as many children as possible. The study is moving forward and is well on track with the recruitment of patients. The data collected from this project will be used when completing a funding application for a new study that will help improve future treatment for amblyopia patients. This is such an exciting project with the added value of benefits to both patients and their parents, who can choose a time to use the iPad to fit in with family commitments. We take this opportunity to thank all clinical trial patients for helping to prove the validity of research being undertaken in Southampton.

## Our grateful thanks

To everyone who has donated to help our research studies, including :

Sue Mcpherson, a regular supporter of our research, for nominating Gift of Sight to the BDB Pitmans Charitable Trust. Set up by the partners of BDB Pitmans LLP to support small charities that have a connection to the firm or its staff members, the Trustees have generously donated a further £1000 to help our work.

The Freemasons Chapter of Maturity 9390 for a lovely £1000 donation, following nomination by a member who has been receiving treatment for age-related macular degeneration.

**ExxonMobil Fawley**. As mentioned a £1000 donation has helped towards the purchase of iPads for childrens eye research. The company have also generously sponsored the costs involved in printing and sending our Gift of Sight newsletters for the past twelve years and have kindly renewed this commitment for a further year.

## Events

We are delighted that our bi-annual **Gift of Sight Lecture** will be held on-line on Thursday 27 May 2021 from 6.00pm—7.00pm. The talks will demonstrate the ground-breaking research taking place at the University of Southampton and University Hospital Southampton through clinical trials.

Our speakers will be Professor Andrew Lotery, Mr Jay Self and Dr Arjuna Ratnayaka. The event will be hosted by Mr Andrew Luff, who is a consultant ophthalmologist and is well known to many of our supporters. There will be a Q&A session after the talks.

The Lecture is being organised by the University of Southampton Events team who will send invitations and details by email soon. Non-email supporters can book through our website [www.giftofsight.org.uk/events](http://www.giftofsight.org.uk/events). Following registration a link will be sent to join the session **up to one week** prior to the event. We're looking forward to the evening and please do share the link with your friends and families.

We hope to be in a position to hold a **Gift of Sight Carol Concert** again this year, and the proposed date is Tuesday 14 December 2021. Various options for the event are currently being considered and any decisions will be advised in our next newsletter. Ongoing regulations from the Government will play a major part in our plans.

Please read our Privacy statement at <https://www.giftofsight.org.uk/gift-sight-privacy-statement>

**Contact:** Ailsa Walter | T:023 8059 9073 Calls will be forwarded to our mobile phone whilst working from home | Email: [info@giftofsight.org.uk](mailto:info@giftofsight.org.uk) | Web: [www.giftofsight.org.uk](http://www.giftofsight.org.uk)

**To donate:** **By card**—T:023 8059 7239 | **On-line:** <https://donate.giftofsight.org.uk/>  
**By cheque:** Please post to **Gift of Sight, Office of Development and Alumni Relations, Building 37, Highfield, Southampton, SO17 1BJ**

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