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PRINTING RETINAL CELLS - A WORLD FIRST

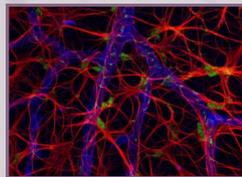


Dr Barbara Lorber

Prof Keith Martin

In a world first, Professor Keith Martin's team at the John Van Geest Centre for Brain Repair, in collaboration with the University of Cambridge Inkjet Research Centre at the Institute for Manufacturing, have successfully printed retinal cells.

Many common eye conditions that can lead to blindness, such as glaucoma or age related macular degeneration are caused by the



loss of nerve cells in the retina. These nerve cells are organised very precisely in relation to one another in order for us to be able to see.

The printing technique enables individual retinal cells to be arranged in precise patterns. The potential ability to organise individual cells in a way that can reproduce the complex structure of the retina could provide a new way to engineer new tissues outside the eye for implantation into patients with retinal damage. The team use a piezoelectric

inkjet printer which ejects retinal cells through a tiny

“...a groundbreaking new way to build tissue with the aim of restoring vision.”

nozzle each time a specific electrical pulse is applied. This is combined with high-speed video technology which records the printing process. At present, the team have successfully printed

retinal ganglion cells, which form the connection between the eye and the brain and glial cells, which play a supporting role in the retina. The aim is now to attempt to print other



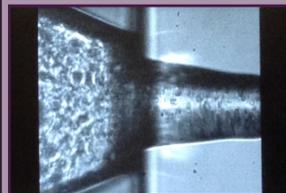
Retinal cells in a jet

cells found in the retina, in particular the light-sensitive photoreceptors, to see if they can be printed successfully in the same way.

Inkjet printing is a groundbreaking technology which has significant potential to grow new tissue with the aim of restoring sight.

Dr Wen-Kai Hsaio
Collaborator at the Inkjet Printing Laboratory

Institute of Manufacturing
University of Cambridge

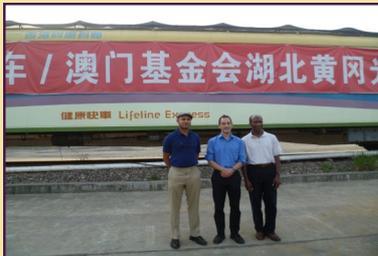


NEW RESEARCH GRANTS

Professor Keith Martin and Dr Amanda Barber have recently been awarded two major new research grants by the Wellcome Trust and Fight for Sight to support their work to regenerate the damaged optic nerve in conditions such as glaucoma. As part of this, Dr Barber has received a highly prestigious Sir Henry Wellcome Fellowship which will support her work in Prof Martin's laboratory for the next 4 years. We look forward to reporting on the progress of this work in future editions of the Newsletter.

LIFELINE EXPRESS

Addenbrooke's consultants Keith Martin, Cornelius Rene and Madhavan Rajan travelled to China in October 2013 as volunteers for Lifeline Express. During this time they visited the



Madhavan Rajan, Keith Martin and Cornelius Rene visit the Lifeline Express Eye Surgery Train

Hospital Eye Train on which sight-saving cataract operations are performed free of charge for people living in remote areas of China that would otherwise not have access to healthcare facilities. Our consultants also undertook lectures and training sessions in clinics and operating sessions at Hospital Centres in rural China.

China has approximately 500,000 new cataract cases diagnosed each year. For those in rural areas, poverty



Meeting with Nellie Fong, Founding Chairman of Lifeline Express

and poor access can make it very difficult to obtain treatment to regain their sight and maintain their livelihood.

In response to this need, the Lifeline Express Hospital Eye Train embarked on its first journey into China's countryside in 1997, with the support from the Ministry of Health (MOH), the Ministry of Railways and the Hong Kong and Macao Affairs Office in Mainland China.

The custom built Eye Train has four compartments, consisting of a consultation room, a preparation



Mr Rene supervised surgery in Nanning, China

room, two operating theatres equipped with the latest technology, a conference room and the surgical team's



Professor Martin advised on the management of complex glaucoma patients in Nanning, China

accommodation.

The success of the first train led to further trains being commissioned and there are now four Lifeline Express Hospital Eye Trains in continuous operation with over 13 000 cataract operations being performed on board each year.

Lifeline Express also performs an important role in training and education, as well as facilitating the interaction between visiting consultant oph-

thalmologists from all over the world and the local Chinese ophthalmologists.

Each train stops at one of twelve locations for three months at a time. Ophthalmologists from the local rural hospital also come on board to learn and assist the more experienced surgeons, receiving hands-on training in the latest surgical techniques.

The organisation has also partnered with the International Council of Ophthalmology to introduce standardised ophthalmology examinations into China. These examinations are conducted worldwide on the same day every year, and were set up by Mr Peter Watson, a retired Addenbrooke's consultant ophthalmologist.

The Lifeline Express training Cen-



The Ophthalmology team in Nanning, China

tres administer this test in the less developed provinces, enabling ophthalmologists practising in more rural locations to test their knowledge and standard against an international benchmark.

The Addenbrooke's team will be travelling to China again this autumn.

"Lifeline Express Centres are located in the most remote areas in China and the appearance of overseas experts would have never happened in their entire history. The lectures, clinics and supervised surgeries performed by Visiting Consultants at the Centres were extremely helpful to the Centres' development. We are truly very thankful that so many Visiting Consultants come to help."



Ms Nellie Fong
Founding Chairman
Lifeline Express

CAMBRIDGE CORNEA AND CATARACT SYMPOSIUM

The annual Cambridge cataract and cornea symposium was held in the Divinity School, St Johns College in May. The one-day conference was chaired and organised by Mr Madhavan Rajan, Clinical lead consultant for the Cornea and Cataract service at Cambridge University Hospitals. The day's programme aimed to provide an update on best practice standards, advances in surgical technique and scientific progress in ocular anterior segment disorders by national and international experts. The meeting was co-hosted by the Cambridge



Cataract guest lecture:
Dr Pavel Stodulka



Cornea guest lecture:
Prof Harminder Dua

University Ophthalmological Society and VERU, Anglia Ruskin University. The first guest lecture of the day, the Cataract Guest Lecture, was delivered by Dr Pavel Stodulka from the Czech Republic who shared his experience of femtosecond laser cataract surgery. This is an exciting new technique that uses a computer-

guided laser to perform the initial steps of a cataract operation which may play a key role in the future of cataract surgery. The Cornea Guest Lecture was delivered by Professor Harminder Dua, the former President of the Royal College of Ophthalmologists. The audience heard how he and his team at Nottingham University used observations made during corneal transplant surgery to discover a new layer in the cornea. He has shown that this 'pre-Desemet's layer' is present

in both adults and children. Next year's symposium will take place on 15th April 2015 in the Divinity School, St John's College, Cambridge.



CAMBRIDGE OPHTHALMOLOGICAL SYMPOSIUM



The Cambridge Ophthalmological Symposium is a two day residential meeting which brings together basic scientists and clinicians to discuss a topic in detail. The aim is provide both groups with the opportunity to interact within and outside the meeting so that those involved in basic science research can hear the views of clinicians and equally the clinicians can come to understand the basic science behind their practice. The

symposium is unique in this respect and many new cooperative ventures have emerged since the symposium's inception.

This year, the 43rd meeting took place in the Divinity School, St Johns College. It was chaired by Mr Anthony Vivian and Mr Michael Clarke and saw international experts come together to discuss challenges within the field of Ocular Motility. Next year's symposium will take place from 3-4th September

2015 and will be chaired by Professor John Marshall from the Institute of Ophthalmology, University College London, on the topic of 'Light'.



Prof John Marshall

Mr Anthony Vivian, who co-chaired this year's symposium has also recently been elected president of BIPOSA, the British Isles Paediatric Ophthalmology and Strabismus Association, an organisation that focuses on enhancing the care of children with visual difficulties and adults with eye movement and alignment problems.

ABOUT US

The Cambridge Eye Trust is an independent registered charity devoted to the prevention of blindness and the restoration of sight by promoting excellence in patient care, research and the continuing education of those involved in the treatment of eye disease.

The trust supports research in the university and hospital Departments of Ophthalmology. Cambridge is in a unique position to develop innovative therapies with the university's strong basic science tradition, talented graduate and undergraduate community and close collaborations with the pharmaceutical industry.

Your donations can help us begin to harness this potential and strengthen the university and hospital Departments of Ophthalmology.

We're all over the web too!
cambridgeeyetrust.org.uk
cambridge-symposium.org
vitreoretinalservice.org



THE CAMBRIDGE EYE TRUST
CHARITY NO. 265140
11 PERRY COURT
CLERK MAXWELL ROAD
CAMBRIDGE, CB3 0RS
UNITED KINGDOM

Phone: 01223 353 789
Email: krgm2@cam.ac.uk
peter.g.watson.cambridge@gmail.com



eHOSPITAL



Addenbrooke's is the first hospital in the UK to become fully digital. All the clinicians and staff involved in patient care will be able to access medical records electronically whenever and wherever they need it. Information will be logged electronically in real time ensuring that medical records are always accurate and up to date.

Patient safety lies at the heart of this transition and

eHospital will provide world-class clinical information systems on the latest computer platforms to deliver the best possible care. The software is being supplied by Epic, the team that also supported the successful implementation of eHospital into

the Johns Hopkins Hospital in Maryland, USA. The new system aims to support clinical decision making, improve patient communication and lead to more effective management of hospital services. Medication can now be prescribed electronically, streamlining the delivery of treatment to patients and helping to ensure people return home without delay.

Dr Keith McNeil, CUH chief executive, said: "This is the most significant decision the hospital has made in recent times, and one which is incredibly exciting and will help transform the way we deliver care to our patients."



THANK YOU

Over the past year, we have had a wonderful response from everyone, including patients, an alumnus and from the organised events. A large amount of the funding has come from the small amounts given by those who have seen our notice in the last Newsletter.

I hope you will continue to help this great work of strengthening the university and hospital Departments of Ophthalmology by ensuring that they have the best research staff and equipment that is available so that they can continue to attract the highest level of support for the research projects which benefit us locally, nationally and internationally.

I want to help support research to cure blindness!

Please provide your name and address below:

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Please tick:

- I can help by a donation and enclose a cheque made out to the Cambridge Eye Trust
- I can help by a secure donation online using PayPal at cambridgeeyetrust.org.uk
- I am a UK Taxpayer and authorise you to claim gift aid on my behalf (this increases the value of your donation by 25% at no cost to you).

Please return this section to the Cambridge Eye Trust at our address in Clerk Maxwell Road.

All current research projects are described on the Cambridge Eye Trust website:
www.cambridgeeyetrust.org.uk

If you wish to sponsor a particular project or have any other ideas as to how you can help, please contact Mr Peter Watson or Professor Keith Martin via the email addresses on the left.

The Annual Report and the accounts are available on the Charity Commission website.