Optometry DistList
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Date: 17 October, 2016
From: Sony Singh (sony.singh@indiavisioninstitute.org)
Subject: **Researchers Can Now Replace Genes that Cause Diseases Like Retinitis Pigmentosa in Mature Photoreceptors**

Cutting out a faulty gene, such as the ones that lead to retinitis pigmentosa, and inserting a healthy version in an adult cell is the ultimate goal of gene editing – and an international team believes it has now achieved this. The types of body cells that do not divide, including the photoreceptors in the adult retina, are a tough challenge for gene-editing scientists. Until now, they have been able to cut a faulty gene out of the DNA, but had to rely on one of the body's natural repair mechanisms – which replaces the deleted gene with a copy from the undamaged second chromosome, rather than allowing new DNA to be inserted.
However, this type of repair only happens when a cell is dividing, and so could not be used in cells like photoreceptors. Therefore, the researchers sought to take advantage of another type of natural DNA repair, a system that pastes a cut DNA strand together without any copying. By tweaking this process, the scientists were able to include a foreign piece of DNA – with the healthy version of a gene that when damaged causes retinitis pigmentosa – in the middle of the pasted strand of DNA in rats with the retinal disease.
These rodents could respond to light, and researchers discovered evidence of healing in their retinal cells, in the paper published in the journal Nature.
California-based Salk Institute researcher, Dr Keiichiro Suzuki, described the feat as "revolutionary" and emphasised that: "No one has done this before." However, the current system only worked in approximately 4.5% of photoreceptors, fellow Salk Institute researcher, Dr Jun Wu, told OT. He explained that: "With this efficiency, we detected improvement of rods and cones' responses based on standard visual tests, but the rat can't actually see."

Therefore, the next step is to boost the effectiveness of the delivery, Dr Wu highlighted, adding: "We also expect, after optimisation in future studies, [a more efficient system] will help reverse the condition and fully restore vision."
Research leader at the Salk Institute, Professor Juan Carlos Izpisua Belmonte, also concluded that: "[This technology] allows us for the first time to be able to dream of curing diseases that we couldn't before, which is exciting."

For the complete article, please visit: https://www.aop.org.uk/ot/science-and-vision/technology/2016/11/18/cut-and-paste
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Date: 20 October, 2016
From: Deepika Reddy (deepikakommanapalli@gmail.com)
Subject: **How Do Our Brains Reconstruct The Visual World?**

Given that we see the world through two small, flat retinae at the backs of our eyes, it seems remarkable that what each of us perceives is a seamless, three-dimensional visual world. Our brains have to do a lot of work with all that raw data that comes in – stitching it all together, choosing what to concentrate on and what to ignore. It's the brain that constructs our visual world.

Neuroscience researchers and cognitive scientists have recently made much progress investigating how this process works. There's a lot more than simple sensory input that goes into building our perception of our visual world.

Eyes + Brain = Vision
Given that the eyes are in constant motion, how does the picture of the world we have in our mind remain so apparently stable? Investigating this apparent discrepancy, neuroscientists have discovered that inputs from the eyes are suppressed during saccades, so we don't register the fast motion and image blur that would otherwise occur. Furthermore, our brain corrects for movements of the eyes using information from the eye muscles that control their movement.

Because the brain omits the information that comes in while the eyes are moving, our visual world is perceived mostly during fixations, the short periods of time (approximately 200-300 milliseconds long) when the eyes are stationary. While reading for instance, our eyes are in motion only 10%-20% of the time.

During each fixation, we must select the visual information most relevant to performing the task at hand. We have an ability to focus on one or several sources of information while ignoring all the rest, or at least reducing their significance. Researchers call this visual attention; they think it's critical for helping us bind together or integrate elementary features (for instance, color, orientation) to form the perception of complete objects in the environment.

Visual Memory Helps Build the Scene

Selective processes such as visual attention let the brain process important information and discard what's not. What is or isn't of interest will be determined by your individual goals. For example, one study showed that observers noticed a change to an object in a virtual reality setting only if that object was made task-relevant at the time of the change. To figure out what is or isn't important to the task at hand, an individual needs a way to retain some information across time. This is where visual memory comes in. It's typically divided into short- and long-term flavors.

Scientists used to think visual short-term memory represented the visual world in detail, stitching together information from every stationary eye fixation to build up a detailed "picture in the head" of our surroundings.

However, more recent research has shown that observers typically don't notice relatively large changes to the visual environment when these changes are accompanied by, say, an eye movement, or some other interruption. This phenomenon is called change blindness.

Research into these phenomena and their associated mechanisms has shown that humans build up a more schematic version of the environment across eye fixations than was previously thought. In combination, these processes allow our brain to create our perception of a coherent, stable visual world.

For the complete article, please visit: http://reliawire.com/brains-reconstruct-visual-world/?utm_content=buffer0f598&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer

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Date: 10 November, 2016
From: AmarnathVenkat (amaropt@gmail.com)
Subject: **Spending More Time Outside Could Lower Risk of Nearsightedness in Children, Waterloo Study Finds**

Children who spend just one extra hour a week outside lower their risk of developing nearsightedness by 15 per cent, a new study from the University of Waterloo has found. "There's a school of thought that people are spending more time up close, they're using more time on the screen, there's probably more studying than before," lead investigator Mike Yang told CBC KW's The Morning Edition host Craig Norris.

"Some of the new research has shifted away from the close work by saying doing close work is taking time away from outdoor time, and it's really the decreased outdoor time that's causing things to shift to a younger age."

The researcher started the study knowing nearsightedness – or myopia – is increasing in children at a younger age. Where historically, children were diagnosed with myopia when they were 12 or 13, now they're seeing children closer to 6 or 7 years old who are nearsighted. 'It's something about the environment, not necessarily what particular activity they're doing.' - Mike Yang, clinical scientist and co-lead study investigator.

The study was completed by the University of Waterloo's School of Optometry and Vision Science and the vision loss agency CNIB. It used 172 students from the public and Catholic school boards in Waterloo region and found 17.5 per cent of the students were nearsighted. Students of parents with nearsightedness were twice as likely to have myopia. Nearsightedness increases from 6 per cent to 28.9 per cent between the ages of six and 13, the study found.

More eye exams, less screen time:
Keith Gordon, vice-president of research at CNIB, said they expect the results would be the same in children across the country and stressed the importance of annual eye exams. "However even with annual check-ups, parents need to ensure that their children spend less time in front of screens and more time outside, even if it's just one extra hour a week," Gordon said. Yang, who co-lead the research, said awareness is the first step and the trend towards younger children developing myopia could be reversed if people take the right steps. There are also treatment options.

He said parents may want to encourage their children to read outside because even that would be beneficial.

For the complete article, please visit: http://www.cbc.ca/news/canada/kitchener-waterloo/university-waterloo-optometry-cnib-nearsightedness-1.3822395
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Subject: **Brien Holden Vision Institute revamps their website**

Brien Holden Vision Institute is an Australian non-government organisation dedicated to vision excellence for all people, focusing on the advancement of eye care through research, education and humanitarian programs. For more than 25 years the Institute has contributed to some of the best in Australian eye care, and has grown to be a major participant and supporter of Australian eye care research and education organisations. It is also a joint founder of India Vision Institute, along with LV Prasad Eye Institute (LVPEI). The institute recently revamped their website.

For more details, please visit :https://www.brienholdenvision.org/
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Subject: **IVI Young Optometry Researcher Rolling Trophy 2016**

India Vision Institute is pleased to announce **"IVI Young Optometry Researcher Rolling Trophy 2016-17".**
The yearly award aims to improve the research capacity of Optometry institutions by developing research interest among undergraduate Optometry students. The award will recognize the winning institution and its student researcher for the best research proposal initiated as part of the course requirement.
Institutions will nominate the best project undertaken among the currently enrolled under-graduate students of Bachelors in Optometry. Only one nomination from each institution will be accepted.

All shortlisted students will get an opportunity to present their projects. The winner will be selected by the expert panel after assessing the projects on the basis of their relevance, innovation and benefits to the field of Optometry.
The award will consist of an IVI Rolling Trophy for the institution and the winning student will also receive a travel grant of INR 5000/- for presenting their winning project at any optometry conference in India.

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Subject: **Eye Care Jobs - an IVI Job Portal**
Launched in September 2014, IVI's sector specific job portal is available free of cost to both recruiters and job seekers. This portal has over 300 registered members. Eye care professionals across India are invited to sign up.

Companies wishing to advertise a current job opening can forward details to: murali.krishna@indiavisioninstitute.org /040 - 2354 8269 or register at www.eyecarejobs.in
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