

New hope for eyes damaged by Parkinson's disease

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(Medical Xpress) -- Scientists have discovered a new avenue for the treatment of vision loss, one of the complications of Parkinson's disease.

Gentle, non-[invasive treatment](#) with a soft infra-red light can potentially protect and heal the damage that occurs to the [human retina](#) in Parkinson's disease, says Professor Jonathan Stone from The [Vision Centre](#) and the University of Sydney.

"Near infra-red light treatment has long been known to promote the healing of wounds in [soft tissues](#) such as skin. Our recent studies are showing that it can also protect the retina of the eye from toxins which attack its [nerve cells](#)," Professor Stone said.

"We have been studying a mouse 'model' of Parkinson's disease, in which such a toxin is used to create a Parkinson-like condition. The toxin targets [brain cells](#) which use a particular signalling molecule called dopamine, and the infrared light - in the right dose and with the right timing - blocks the [toxic effect](#)."

The toxin also kills certain key retinal cells which are important in giving sharpness to the retina's coding of visual images. Infrared light also protects these [retinal cells](#) and reduces the damage.

The new results suggest that infra-red radiation will be effective in Parkinson's disease, Professor Stone said. Because the radiation is effective at low intensities, with no known toxicity, there are few

barriers if any to trials in humans.

"As shown in these studies on mice, protection or rescue of neurons in the brain - and as we know now, in the retina - is better than the best established treatments for Parkinson's disease," Professor Stone said.

"The challenge now is to translate these findings, made in mouse models, to human patients suffering from Parkinson's disease.

"Diseases such as Parkinson's are seriously debilitating; for the individual the need is immediate. There is every reason for clinical trials to be carried out as soon as possible."

As to the potential benefits for Parkinson's patients, he says:

"Principally, we anticipate there would be a preservation of acuity, the clarity with which we can see detail and contours in the visual world. The same treatment should be protective for the brain as well, preventing or slowing the otherwise relentless progress of the disease. As always, we will need rigorous trials, to know what can be achieved."

It is no surprise, Professor Stone observed, that the same treatment works for both the brain and the retina. "The retina of the eye is really part of the brain - the only part outside the skull. It has to be outside the skull, so it can function as an eye. In many ways the retina is the most accessible part of the brain, and many discoveries about the brain have begun in the retina.

"Parkinson's is a double-whammy disease," says Professor Stone. "Our dream is turn back both the damage to the brain, and the damage to the retina. Increasingly, this seems possible."

The study 'Survival of Dopaminergic Amacrine Cells after Near-[Infrared Light](#) Treatment in MPTP-Treated Mice' by Cassandra Peoples, Victoria E Shaw, Jonathan Stone, Glen Jeffery, Gary E Baker and John

Mitrofanis was published in *ISRN Neurology* in May.

More information:

www.ncbi.nlm.nih.gov/pmc/articles/PMC3369478/

Provided by University of Sydney

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