BBC NEWS

Research opens way for bionic eye

US scientists have opened the way for the development of a "bionic eye".

They used electrodes to stimulate an area of the brain that processes visual information, the Proceedings of the National Academy of Sciences reported.

The results in monkeys increase the chance that people with conditions such as glaucoma will one day have their vision restored with a prosthetic eye.

But experts warned it would be a big hurdle to implant enough electrodes to recreate an entire image in the mind.

Researchers have looked at several ways of restoring sight to people who have become blind because of an accident or common diseases such as macular degeneration.

In such patients, the eye has ceased to function but the visual centres in the brain are intact.

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> Dr John Pezaris, lead researcher

The goal is to bypass the eye and stimulate the visual parts of the brain to recreate an image in the mind.

Visual signal

The team used normal-sighted monkeys to test whether stimulating an area of the thalamus deep in the brain could produce a visual signal.

First they trained the monkeys to look at suddenly illuminated points of light.

Then they placed one or two very fine electrodes into the appropriate area of the brain to see what their reaction would be.

They found that the monkeys moved their gaze in the same way they would if a point of light appeared.

Lead researcher, Dr John Pezaris, research fellow at Harvard Medical School, said the experiment was an important step but one of the major hurdles to a human prosthesis would be to get many more electrodes in place.

"We need to increase the number of electrodes 100-fold before this would be useful in patients."

He explained that lots of electrodes would need to work together for patients to distinguish patterns and therefore full images.

The idea is that eventually a patient would wear a special set of glasses with a small digital camera mounted in the lens.

An external signal processor would translate the image from the camera into impulses and transmit them wirelessly to a stimulator implanted in the brain, which would deliver images to the visual system.

"This research is an important step," Dr Pezaris added.

Ian Andolina, researcher in the UCL Institute of Ophthalmology in the UK, said the experiment demonstrated the principle worked.

"The way this bit of the brain is structured allows you to stimulate the central part of the vision very well, which would be important for conditions such as macular degeneration," he said.

"But there is a fairly big problem for the future, which is how they are going to increase the number of stimulating electrodes as it sits deep in the brain."

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