



Fact sheet: Bionic eye

The Centre for Eye Research Australia (CERA) is a key partner in Bionic Vision Australia (BVA), a consortium of world-leading Australian researchers, collaborating to develop an advanced bionic eye.

What is a bionic eye?

The retina at the back of the eye converts images into nerve signals that travel via the optic nerve to the brain. Damage to the retina causes vision loss. The bionic eye uses a retinal implant connected to a video camera that converts images into electrical impulses that activate remaining retinal cells that then carry the signal back to the brain. In this way the bionic eye mimics the function of the retina and restores sight.

How does the bionic eye work?

A video camera built into a pair of glasses transmits images in real time to a video-processing unit. Light patterns represented as electrical pulses are transmitted from the unit to a retinal implant containing an array of electrodes. These electrodes will activate remaining retinal cells that then send visual information along the optic nerve to the brain, where the image is interpreted.

Who will benefit from the bionic eye?

People with severe vision loss caused by retinal diseases such as age-related macular degeneration and retinitis pigmentosa will benefit.

Who are the core Bionic Vision Australia partners?

Bionic Vision Australia brings together a unique consortium of researchers, electrical and biomedical engineers, neurophysiologists and eye specialists from:

- The University of New South Wales (UNSW) School of Biomedical Engineering
- The Centre for Eye Research Australia
- The Bionic Ear Institute
- National Information Communications Technology Australia (NICTA)
- The University of Melbourne

The Royal Victorian Eye and Ear Hospital is the clinical partner of the BVA collaboration and the planned home of the first retinal implant.

When will the first bionic eye be implanted?

Researchers aim to implant the first bionic eye at the Royal Victorian Eye and Ear Hospital in 2013. Using 98 electrodes, it will be used to provide patients affected by severe vision loss with increased mobility and independence.

This bionic eye will be an improvement on technology that has been trialled in Europe and the USA.

A more advanced device using 1000 electrodes will also be developed. This device is intended to give recipients the ability to see finer detail.

How will the bionic eye benefit the wider community?

Development of an advanced bionic eye by Australian researchers brings the additional benefits of world-wide commercialisation potential, employment and enhancement of biotechnology research in Victoria and Australia.

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