

Scientists Create First Organic Artificial Retina

Roberta Cutillo (January 22, 2020)



The Italian Institute of Technology created the first completely organic artificial retina, which will help millions of patients regain their vision.

Though scientists had already succeeded in making artificial retinas, the one created by the Italian Institute of Technology is the first-ever to be made out of only organic materials: precisely, 3 polymeric layers, that is, mainly composed of carbon, just like living tissue.

This should render it more compatible and reduces the risk of it being rejected by the body after the operation.

"As compared to the two models of artificial retina currently available which are based on silicon technology," commented Fabio Benfenati, the Director of the Centre of Synaptic Neuroscience (NSYN) in Genoa, "our prototype has a number of advantages including marked tolerability, long duration and full autonomy of functioning, with no need for an external power source."



The aim of this artificial retina is to treat patients suffering from Retinitis pigmentosa, a rare, genetic degenerative eye disease which involves the breakdown and loss of cells in the retina (the light sensitive tissue that lines the back of the eye) and can cause severe vision impairment.

Its three layers are: a substrate derived from a soy protein, a conductive polymer, and a semiconductor. It works like a solar panel, converting light into electrical signal, which is transmitted to the retina's neurons.

According to a study published in the international journal Nature Materials, great results were obtained when the retina was tested on mice affected by retinitis pigmentosa in 2017. The implanted retinas remained perfectly intact 10 months after the operation, with none of the materials showing any sign of degradation.

Experiments conducted on pigs have shown that as the retina's dimension increases, so does the risk of detachment, which could prove problematic when dealing with human patients. However, scientists are hopeful that they will soon be able to help millions of people regain their vision.

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