Experimental retina implants give mice infrared vision

Finally, the tellurium meshes, especially the infrared vision capability they offered, were tested on healthy macaques, an animal model that’s much closer to humans than mice. It turned out implanted macaques could perceive infrared light, and their normal vision remained unchanged.

However, there are still a few roadblocks before we go all *Cyberpunk* with eye implants.

Sensitivity issues

Tellurium meshes, as the Fudan team admits in their paper, are far less sensitive to light than natural photoreceptors, and it’s hard to say if they really are a good candidate for retinal prostheses. The problem with using animal models in vision science is that it’s hard to ask a mouse or a macaque what they actually see with the implants and figure out how the electrical signals from their tellurium meshes are converted into perception in the brain.

Based on the Fudan experiments, we know the implanted animals reacted to light, albeit a bit less effectively than those with healthy vision. We also know they needed an adaptation period; the implanted mice didn’t score their impressive results on their first try. They needed to learn what the sudden signals coming from their eyes meant, just like humans who had used electrode arrays in the past. Finally, shapes in the shape recognition tests were projected with lasers, which makes it difficult to tell how the implant would perform in normal daylight.

There are also risks that come with the implantation procedure itself. The surgery involves making a local retina detachment, followed by a small retinal incision to insert the implant. According to Eduardo Fernández, a Spanish bioengineer who published a commentary to Fudan's work in Science, doing this in fragile, diseased retinas poses a risk of fibrosis and scarring. Still, Fernández found the Chinese implants "promising." The Fudan team is currently working on long-term safety assessments of their implants in non-human primates and on improving the coupling between the retina and the implant.

The Fudan team's work on tellurium retinal implants is published in Science.

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