



Sticking these tiny needles in your eye may help fight blindness

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An eye patch covered in tiny needles sounds like a torture device straight out of one of the Saw movies. In fact, it's the invention of researchers in Singapore, who have been searching for a better way of treating eye diseases, such as [glaucoma](#) and macular degeneration.



Currently, these diseases are most commonly treated with eye drops. However, eye drops are not always sufficient to deliver large enough quantities of drugs. Nor are they particularly well-suited for delivering drug doses over an extended period of time. That's where the somewhat squirm-inducing new treatment comes into play. It involves an eye patch studded with tiny dissolvable needles. The patch is placed onto the patient's eye and then removed, leaving the microneedles embedded in their cornea. The microneedles consist of two layers: An outer layer which delivers an initial drug dose and an inner layer which delivers a secondary drug dose over the course of several days.

“This work provides a new strategy for efficient drug delivery into the eye,” [Chen Peng](#), a professor in the School of Chemical and Biomedical Engineering at Nanyang Technological University, told Digital Trends. “With simple pressing of the eye patch on the eye, the detachable tiny needles can penetrate the ocular surface tissue, and serve as implanted micro-drug-reservoirs. The biphasic drug release kinetics enabled by the double-layered micro-reservoirs largely enhances the therapeutic efficacy.”

So far, the needle-studded eye patch has been tested on mice, where it demonstrated significantly more efficiency than regular eye drops. “Using corneal neovascularization as the disease model in mice, delivery of an anti-angiogenic monoclonal antibody by [the] eye patch can reduce 90 percent of neovascular area, which is much better than drug efficacy using eye drops, [which is around 15 percent,” Peng continued.

The researchers are currently optimizing the eye patch, focused predominantly on the microneedles' composition and stiffness. This will enable better practical use. They are also in the process of searching for clinical collaborators for a medical trial, with the ultimate goal of commercializing the technology.

A paper describing the work, “Self-implantable double-layered micro-drug-reservoirs for efficient and controlled ocular drug delivery,” was [recently published in the journal Nature Communications](#)