Scientists Develop "Contact Lens" Patch To Treat Eye Diseases

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Scientists in Singapore have developed a "contact lens" patch with microneedles that could provide a painless alternative to current methods of treating eye diseases such as glaucoma and macular degeneration.

Current treatment methods such as eye drops and ointments are hindered by the eye's natural defenses, blinking, and tears.

Eye injections can be painful and carry a risk of infection and eye damage. And some patients are unable to keep up with the prescribed regime for their eye ailments.

The new "content lens" patch, successfully tested in mice, is covered with biodegradable microneedles that deliver drugs into the eye in a controlled release.

After pressing it onto the eye surface, much like putting on contact lenses – the drug-containing microneedles detach by themselves and stay in the cornea, releasing the drug over time as they dissolve.

When tested on mice with corneal vascularization, a single application of the patch was 90 percent more effective in alleviating the condition than applying a single eye drop with 10 times more drug content.

"The microneedles are made of a substance found naturally in the body, and we have shown in lab tests on mice that they are painless and minimally invasive," explains Professor **Chen Peng**.

“If we successfully replicate the same results in human trials, the patch could become a good option for eye diseases that require long-term management at home, such as glaucoma and diabetic retinopathy,” he says.

The device would also help patients who find it hard to keep up with the regime of repeatedly applying eye drops and ointments as well.

Prof Chen added that the patch could also help to tackle the rising disease burden of eye conditions. A local 2018 study projected that patients with eye diseases in Singapore will rise significantly by 2040, with glaucoma, diabetic retinopathy and age-related macular degeneration cases set to double.

The novel approach, developed by a team led by NTU Singapore, with clinical insights from Singapore National Eye Centre’s Associate Professor Gemmy Cheung, was published in *Nature Communications* earlier this month.

Image Credit: NTU Singapore. (L-R) Assistant Professor Wang Xiaomeng from NTU’s Lee Kong Chian School of Medicine and Professor Chen Peng from the NTU School of Chemical and Biomedical Engineering are part of an NTU team that developed a ‘contact lens’ eye patch to treat eye diseases.

Source:

1. NTU Singapore scientists develop ‘contact lens’ patch to treat eye diseases. 2018, November 20. EurekAlert! Retrieved: https://www.eurekalert.org/pub_releases/2018-11/ntu-nss111918.php