Kyle Chua 17 hours ago 2 min read

NTU Scientists Develop Saline-Powered Battery That Could Power Smart Contact Lenses

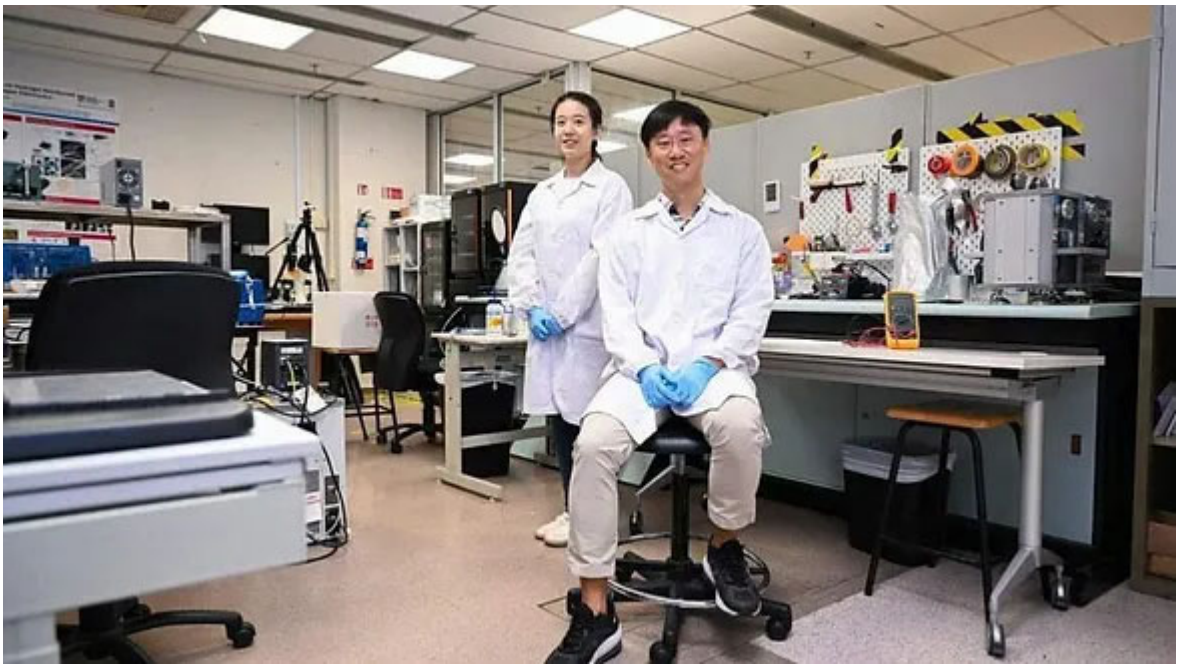
The smart contact lenses that you've probably seen in science fiction movies is a step closer to becoming a reality thanks to a recent breakthrough.

Scientists from Nanyang Technological University (NTU) in Singapore have developed a flexible battery as thin as a human cornea that can store electricity when immersed in saline solution. The battery cells are able to generate electric charges because they're coated with glucose, which react with the sodium and chloride ions in the saline solution in the contact lens case.

Such ions are also naturally found in the liquid layer of your eyes, enabling the battery to receive more power while being worn, NTU School of Electrical and Electronic Engineering Associate Professor Lee Seok Woo told The Straits Times.

Professor Lee has been working on the project since 2019 and now hopes to continue improving its performance. In its current state, the battery can already power a smart lens and send a continuous Bluetooth signal to a smartphone for over 12 hours. It can also be charged up to 200 times before it starts to degrade.

However, it could still take some time before it'll power consumer products as human tests haven't even begun. Professor Lee said he has only tested it on mammal cells so far, which proved successful. The battery reportedly didn't show signs of deterioration when in contact with the lens, indicating it's biocompatible and safe for humans to wear.



Still, Professor Lee wants to minimise risks as much as possible. "We have not tried the lens on a human eye yet, because there are many levels of safety checks. That will be the final step," he said. "The eye is very delicate and we must guarantee safety."

He additionally explained that there are no toxic substances like metals or wires in the battery, making it safe to wear. The battery is also embedded along the sides of the human lens, ensuring vision is not obstructed.

Smart lenses are expected to become a key pieces of consumer technology in the future. These advanced contact lenses can display information on your corneas and can power mixed reality experiences.

Currently, they're being used in various health applications, including vision correction, health monitoring and disease treatment for patients with diabetes and glaucoma, for example. But in the future, these devices could also be capable of recording everything you see and hear.

Professor Lee and his team's breakthrough helps realise the potential for such applications.

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