

A contact lens that can show when blood glucose levels are high

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Overview of the wirelessly rechargeable smart contact lens. Credit: Jang-Ung Park, Yonsei University

A team of researchers affiliated with several institutions in the Republic

of Korea has developed a contact lens with a tiny LED light that turns on and off to show blood glucose levels. In their paper published in the journal *Science Advances*, the group describes how they made their contact lens and how well it worked when tested.

The current standard method of at-home glucose testing is collecting a tiny blood sample and then using a micro-scale device to test. While not unduly painful, most diabetics would likely prefer a means for testing their glucose that is both gentler and easier to carry out. Because of that, [health scientists](#) continue to carry out research looking for a better way. Prior research has shown that human tears can be used to test for glucose levels, leading many to look into ways of obtaining it for testing. In this new effort, the team in Korea has designed and built a [contact lens](#) with a tiny LED light that remains lit when [glucose levels](#) are normal and turns off when they go too high—they have named it, aptly enough, the "wireless smart contact lens." The device exploits the body's automatic and continuous secretion of tears to keep the eyes from drying out.

To make the new contact lens, the team used ultrafine printing methods to create rectifying circuits, a supercapacitor and an LED that were small enough to fit on the inside of an ordinary contact lens. The circuits and the supercapacitor were also printed using the same clear material used to make [soft contact lenses](#) to prevent obstructing vision. The arrangement also allowed the device to be charged wirelessly, which means it does not need to be removed for charging. The researchers report that when the contact is in the eye, only the LED is visible to the user, and it does not obstruct vision because it is placed over the iris and not the pupil. They further report that the contact lens itself is identical to commercial soft contact lenses. They say that a test rabbit fitted with the [lens](#) showed no signs of discomfort, and the LED turned on and off just as designed.

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