

Color-changing contact lenses to help diabetics (w/ Video)

May 23 2012

For the millions of Americans with diabetes, the inconvenient and often painful method of testing blood sugar levels is a way of life. But research and innovative product design by scientists at The University of Akron may eliminate the need for needle pricks, blood draws, or other invasive devices.

Researchers have developed a [contact lens](#) that senses glucose which is the blood sugar in tears, the natural fluid that bathes the eye. If sugar is not being metabolized properly and glucose concentration builds up in the body, the contact [lens](#) will detect a problem and change color.

“It works just like pH paper in your high school chemistry lab,” explains Dr. Jun Hu, associate professor of chemistry at The University of Akron. “The pH paper changes color depending on the acidity or the proton concentration of the liquid applied. That is similar to what happens in our specially designed contact lens, the sugar molecule literally acting like the proton in a pH test, displacing a color dye embedded in the lens, and the lens changes color. ”

The person wearing the lens won't notice the color change unless he or she looks in the mirror. So scientists are designing a smart phone application (“app”) that literally takes a picture of the eye and calculates the sugar concentration in the lens. “All you need is a smart phone with a camera,” says Dr. Hu, an organic chemistry researcher who has been with UA since 1999. “This device could be used to detect subtle changes in [blood sugar levels](#) for tight management of [diabetes](#). It can also be

used to identify patients with pre-diabetic conditions, allowing early diagnosis that is crucial for preventing diabetes from advancing. Glucose concentrations in tears can be used to intermittently or continuously monitor diabetic patients just as effectively as blood sugar levels measured directly from blood from a pricked finger.”

The convenience of contact lenses could boost patient compliance to blood sugar testing, as it will reduce discomfort, inconvenience, and even cost. In addition, [blood sugar](#) also changes rapidly throughout a normal, active day, so a device that can monitor glucose many times in a day will provide diabetic patients with a very powerful tool in combating such a damaging condition.

Provided by University of Akron

Citation: Color-changing contact lenses to help diabetics (w/ Video) (2012, May 23) retrieved 19 April 2024 from

<https://medicalxpress.com/news/2012-05-color-changing-contact-lenses-diabetics-video.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.