

Smart contact lenses could make eye drops a thing of the past

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(Medical Xpress) -- An Auburn University team of chemical and biomedical engineers led by Mark Byrne, the Daniel F. and Josephine Breeden Associate Professor in the Samuel Ginn College of Engineering, has developed a new method to deliver eye medication by wearing contact lenses.

Byrne's lenses are the first to release [drug doses](#) over time for as long as the contact should be worn. The lenses deliver a constant flow of medication without altering a patient's natural vision, or can be used to correct vision while also delivering eye medication, such as anti-inflammatories, antibiotics and anti-allergy drugs.

"Eye drops may soon be a thing of the past," Byrne said. "Results indicate that our lenses release a constant [drug concentration](#) for the entire time the lens is worn. This is about 100 times better than the [conventional therapy](#), which consists of drug delivery via eye drops. With numbers that impressive, this technology is a real game-changer."

Byrne's contacts can be worn for up to 24 hours with daily wear lenses or up to 30 days with extended wear lenses. In contrast, eye drops often wash away within 30 minutes, requiring drops multiple times throughout the day for successful treatment.

"Unlike other [contact lens](#) technologies, we make our lenses," says Byrne. "These aren't contacts soaked in a medication that only release for a very short time. We are administering a drug through controlled

release by creating drug memory in the lens structure while maintaining all of the other lens properties."

The researchers' paper, "Sustained In Vivo Release from Imprinted Therapeutic Contact Lenses," demonstrates how Byrne's group achieved extended release of a small therapeutic through drug delivery from molecularly imprinted contact lenses worn by a rabbit. This is the first time that a steady, effective concentration of a drug has been maintained in tear fluid for the duration of lens wear, or for 24 hours in their study.

"[Eye drops](#) and ointments make up more than 90 percent market share, but are an inefficient, inconvenient method," Byrne said. "Our lenses offer the increased efficacy and efficiency of [drug delivery](#), which translates to better eye health."

Byrne recently presented his study at the annual American Institute of Chemical Engineers' meeting in Minneapolis. His research team's findings have also been published in the Journal of Controlled Release. His team includes chemical engineering doctoral students Arianna Tieppo and Charles White, chemical engineering undergraduates Amanda Paine and Matthew McBride and ophthalmologist Dr. Meredith Voyles, assistant professor in Auburn's College of Veterinary Medicine.

More information: [www.elsevier.com/wps/find/jour ...
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Provided by Auburn University

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