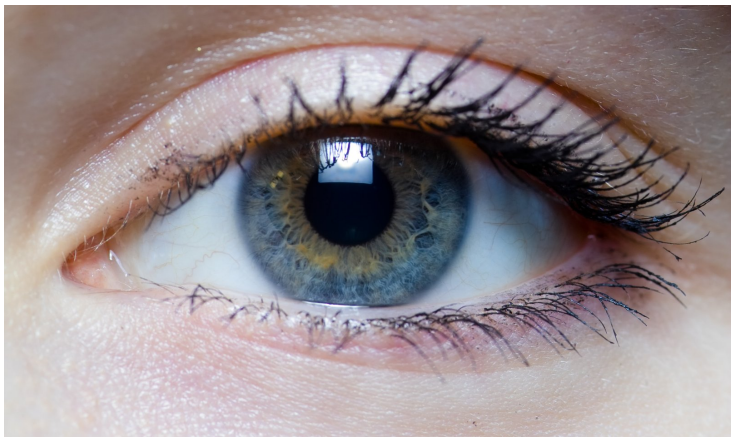
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Researchers in Israel invent nano-drops for improving sight

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In the future, this technology may enable patients to have their vision corrected in the comfort of their own home.



Singapore - A revolutionary, cutting-edge technology, developed by researchers at Bar-Ilan University's Institute of Nanotechnology and Advanced Materials(BINA), has the potential to provide a new alternative to eyeglasses, contact lenses, and laser correction for refractive errors.

The technology, known as Nano-Drops, was developed by Dr. David Smadja (Ophthalmologist from Shaare Zedek Medical Center), Prof. Zeev Zalevsky, from Bar-Ilan's Kofkin Faculty of Engineering, and Prof. Jean-Paul Moshe Lellouche, Head of the Department of Chemistry at Bar-Ilan. A related patent on this new invention was recently filed by Birad - Research & Development Company Ltd., the commercializing company of Bar-Ilan University. Steve Elbaz is a Co-Founder and Chief Business Officer of the new technology.

Nano-Drops achieve their optical effect and correction by locally modifying the corneal refractive index. The magnitude and nature of the optical correction is adjusted by an optical pattern that is stamped onto the superficial layer of the corneal epithelium with a laser source. The shape of the optical pattern can be adjusted for correction of myopia (nearsightedness), hyperopia (farsightedness) or presbyopia (loss of accommodation ability). The laser stamping onto the cornea takes a few milliseconds and enables the nanoparticles to enhance and 'activate' this optical pattern by locally changing the refractive index and ultimately modifying the trajectory of light passing through the cornea.

In the future, this technology may enable patients to have their vision corrected in the comfort of their own home. To accomplish this, they would open an application on their smartphone to measure their vision, connect the laser source device for stamping the optical pattern at the desired correction, and then apply the Nano-Drops to activate the pattern and provide the desired correction.