

# Clerio Vision plans revolution in contact lenses

By GINO FANELLI

**B**lasting over a decade of research and 60 issued or pending patents, Rochester's Clerio Vision Inc. is eyeing the release of a potentially revolutionary step for contact lenses by the dawn of the next decade.

Founded in 2014, Clerio Vision is based upon femtosecond laser research carried out by the University of Rochester's Flauraum Eye Institute and its Institute of Optics and Bausch & Lomb. Their cornerstone tech is LIRIC, or laser induced refractive index correction. In layman's terms, the technology allows laser writing onto contact lenses, or directly onto the cornea, which can change the way light interacts with the eye—essentially a prescription directly written onto the eye that effectively reverses conditions such as myopia, presbyopia and astigmatism.

Clerio is led by iCardiac founder Alex Zapesochy as chairman and Mikael Totterman as CEO, with over \$17 million in invested capital from Stonehenge Growth Equity, Armory Square Ventures and Cranberry Capital.

"This is a company where the technology is really quite a few years in the making, so the University of Rochester was working for a number of years with a very prominent company in the contact lens space (Bausch & Lomb) and was working on some really fascinating technology that was really going to be quite revolutionary," Zapesochy said.

Clerio was able to purchase the license for those patents, perhaps most notably the research done by the Flauraum Eye Institute's Wayne Knox, who now serves as Clerio's chief science officer, and Krystel Huxlin, who developed the idea for the LIRIC system. LIRIC is similar to LASIK, although with one key difference: it's entirely non-invasive and has no potential for scarring or

other tissue damage.

"What's really unique is that one of the big issues for things like LASIK is it's still invasive—you cut open part of your cornea (and) there's scarring on some tissue, although it's a procedure that people very much like," Zapesochy said. "What's unique (about LIRIC) is that because the laser is low-powered and because of the way it works, it's absolutely tissue sparing, meaning it is truly non-invasive. We're able to change properties within the cornea permanently but in a way that does not cause any scarring."

But it's in the contact lens space where Clerio shows the chance to truly shine: The LIRIC system allows contact lenses to be manufactured in a manner that addresses conditions like presbyopia, which affects the eyes' ability to focus on objects at different distances. There are already multifocal contact lenses on the market, but Zapesochy said the ability to write with LIRIC will make Clerio's offerings cheaper and more easily manufactured.

"We are able to do a contact lens that is uniquely able to fix (presbyopia) but also, the contact lens is quite affordable in comparison to some of the current efforts made to fix this condition," Zapesochy said. "And there's also some other unique things we can do with these contact lenses to treat various conditions."

Clerio is planning their first product rollout in about 18 to 36 months, which is a contact lens oriented toward people over 40 and presbyopic—a potentially massive market due to the nature of the condition. Most people develop presbyopia with age. According to the *Journal of the American Medical Association*, about 1 billion people globally have presbyopia, and, past the age of 35, the number of people with the condition exceeds 50 percent. Across the contact

lens, surgical and interocular lens spaces, Clerio has a potential market valued at about \$15 billion.

"On the contact lenses, it's a product primarily worn by folks from their teens to their mid-40s, and as Alex pointed out, once people develop presbyopia, they are no longer able to use most contact lenses, because the optics really aren't that good in those," Totterman said. "Currently, the global contact lens market, primarily a single-vision lens market, is about \$12 billion in revenue. If everybody that started wearing contact lenses continued wearing them from their mid-40s to their 60s or early 70s, that market would be two times larger.... It could end up being a very large manufacturing operation over time."

Clerio employs about 50 people, but Totterman and Zapesochy expect that number to grow rapidly as the company moves into a market-scale production phase. Clerio's manufacturing process essentially involves purchasing base lenses from a large-scale supplier, writing their prescriptions into the lenses and sending them off into the market. Initially they plan to add another 10 to 20 employees, with more coming in as volume scales.

"Manufacturing is currently being done in Rochester for doing the laser inscription and etching into the contact lenses, and we are intending to continue to keep manufacturing in Rochester as we scale up toward commercial launch," Totterman said.

It's a prospect Totterman is confident about, estimating that for the company to hit the \$100 million revenue mark, they'd need to reach 800 optometrists offices. There were 37,240 optometrists in the U.S. in 2017, according to the Bureau of Labor Statistics.

The opportunities for Clerio do not end with presbyopia. With their tech, Zapesochy



Photo Provided  
Clerio Vision Inc. employees at work.

my sees a litany of possibilities that could change the optometry market as we know it, from entirely custom optics focused specifically on the aberrations in an individual's eyes to large-scale, affordable production of contacts addressing conditions which often go untreated.

"We're only getting started with multifocals. This (technology) allows us to do many things that were never possible in contact lenses," Zapesochy said. "We can look at your very specific eye errors and can make, at a low cost, an entirely customized set of optics that would allow you to get to something called 'supervision.' Most people see 20/20, but they could generally see better than 20/20 if all of their optical aberrations were corrected."

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