Seeing inside the eye with fluorophotometry

In the early 1980s, the Palo Alto-based medical division of Coherent, Inc., developed the Fluorotron Master, a fluorophotometer used to quantify fluorescence inside the human eye. The device was originally intended to operate similar to fluorescein angiography, by indicating the leakage of fluorescein dye from the retina into the vitreous.

Decades later, it has evolved into a laboratory device that is used much differently than fluorescein angiography. Whereas fluorescein angiography is more visual, fluorophotometry provides quantitative measures of fluorescein concentration that are versatile enough to indicate subtle changes in the health of the retinal blood vessels, retinal pigment epithelium, choroid and ciliary processes.

Now researchers around the world use the Fluorotron to detect blood-retinal barrier breakdown in diabetes, cornea and lens autofluorescence in diabetes, blood-aqueous barrier breakdown in uveitis, aqueous turnover in glaucoma, tear turnover and volume in dry eye, corneal endothelial permeability after corneal surgery, and corneal epithelial barrier function when contact lenses are worn.

The transition of the device began in March 1993, when Bruce M. Ishimoto, MS, founded OcuMetrics, Inc. to focus on the advancement of the Fluorotron Master. “I had been one of the engineers who helped develop the Fluorotron at the medical laser company Coherent,” Ishimoto remembers. “Although they had developed the Fluorotron to be something they could sell with lasers, it turned out to be a smaller research market than the clinical market they had intended. It seemed like the perfect device for a small business to cultivate.”

Because the device had initially been built for use in humans in the clinic, Ishimoto’s team first developed a new version that was adapted for basic research involving laboratory animals. Today, OcuMetrics’ stable of devices includes the laboratory animal version (which can be used on rats and larger animals), a human version and a new version that can be used on mice in the laboratory.

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“Fluorotron Master, continued from page 1

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“We can make modifications to the machine that tailor it to addressing a specific customer’s needs.”

—Bruce Ishimoto

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