

# **A novel approach to using light to treat macular degeneration**

Professor Janis Eells, PhD, Department of Biomedical Sciences, College of Health Sciences, is working on a potentially life-altering treatment for persons with macular degeneration.

As the population continues to age, degenerative ocular diseases, such as age-related macular degeneration (AMD), have become increasingly common and create an enormous burden on the health care system.

In the U.S. alone, over 2 million patients have AMD and another 8 million people are at risk. Approximately 85-90% of the AMD patients have the “dry” form of the disease and this population is expected to increase to almost 22 million by 2020.

The emotional and socioeconomic impact of AMD is large because of the reading and driving impairment caused by the disease, which primarily affects central (straight-on) rather than peripheral (side) vision. It is said that AMD can take away an average of five quality years of life.

There are no active approved treatments for dry AMD and it is predicted to become a more prevalent cause of blindness than both diabetic retinopathy and glaucoma combined.

## **Light therapy as a treatment**

In their effort to develop treatment options for dry AMD, scientists, like Eells, have discovered through small clinical studies that treatment with light in the far-red (FR) to near-infrared (NIR) range of the spectrum may improve visual acuity in the patients. This treatment has been termed low-level light therapy (LLLT), or more recently photo biomodulation (PBM). The term connects three words: photo = light, bio = biological and modulation.

Photo biomodulation is an FDA-approved method for treating arthritis and sport injury. This technology transfers well to the treatment of AMD as it is non-invasive, non-pharmaceutical, easily administered, and safe with no serious side effects noted.

This treatment involves the use of an LED medical device that looks similar to a microscope but is designed to shine a beam of FR/NIR light into one or both eyes. Patients look into the device as a beam of light shines through the lens toward the back of the eye. The low doses of light delivered to the retina by this instrument stimulate cell function, and slowly and partially reverse the effects of AMD.

## Partnering up to impact lives

With a new National Institutes of Health-Small Business Innovation Research (NIH-SBIR) grant, Eells is partnering with LumiThera Inc., a company founded by physicians, scientists and engineers with extensive expertise in non-invasive LED and laser treatments for eye disease.

Lumithera's patented approach uses multi-wavelengths that stimulate activation in eye cells for those with age-related ocular disorders.

Through collaboration with scientists like Eells, the company is developing a small, bench-top LED device that can be controlled by a physician readily through a touch screen.

Eells has spent much of her career studying the healing potential of light therapy for the treatment of a wide variety of diseases and conditions and considers this grant a significant milestone in her career.

“It's been a long-time professional goal of mine to receive a grant from the NIH National Eye Institute, and now it's finally happened. I'm excited to see where we can take this important and potentially life-changing research with their support,” she said.

She emphasized the importance of photo biomodulation in initiating cell repair in aging and degenerative diseases, “This type of therapy has the potential to dramatically improve health care for those with no other options. Research in this area has become my life's work and I couldn't be prouder to be a part of the team making this treatment option a reality.”

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