FOUNDATION FIGHTING BLINDNESS

STARGARDT DISEASE RESEARCH ADVANCES

Gene Therapy Clinical Trial Underway for Stargardt Disease

The first-ever gene therapy clinical trial for Stargardt disease is underway in the U.S. (Portland, Oregon; Miami, Florida; and Houston, Texas) and Paris, France. The treatment, which replaces mutated copies of the gene ABCA4 with normal copies, is being developed by the pharmaceutical company Sanofi. The Foundation Fighting Blindness funded many of the pivotal lab studies that are making the Phase I/II Stargardt disease gene therapy clinical trial possible.

Alkeus Launches Clinical Trial for Drug Designed to Reduce Toxins in Retina

The biotech company Alkeus is conducting a multi-center Phase II clinical trial for a drug (ALK-001) that targets the toxic build-up in the retina that is thought to cause degeneration and vision loss. The emerging therapy is a modified form of vitamin A, which when metabolized in the retina, results in much less waste. Scientists developed ALK-001 by replacing hydrogen atoms in vitamin A with deuterium. Known as deuterated vitamin A, it "burns cleaner" than the natural form. Deuterium is a safe, naturally occurring, stable form of hydrogen, which is present in the human body.

Acucela Launches Clinical Trial of Drug for Stargardt Disease

Emixustat, an oral drug which originally targeted the dry form of age-related macular degeneration (AMD), is moving into a Phase II clinical trial for Stargardt disease. While the drug did not meet desired outcomes in the AMD clinical trial, experts believe it may work well for people with Stargardt disease. Developed by Acucela, the drug works by slowing the buildup of toxic waste products that lead to retinal degeneration in a number of retinal conditions, including Stargardt disease.

Stargardt Disease Natural History Study Will Help Prepare for Future Clinical Trials

The Foundation Fighting Blindness Clinical Research Institute is conducting a $6 million natural history study for people affected by Stargardt disease. Known as ProgSTAR, the study has three primary goals: 1) Determine the best outcome measures to accelerate evaluation of emerging treatments in clinical trials, 2) better understand disease progression for selecting future clinical trial participants, and 3) identify potential participants for forthcoming clinical trials. The study has enrolled

365 patients in 10 international clinical centers.

Research Team Is Creating Patch Derived from Stem Cells to Restore Vision

David Gamm, MD, PhD, at the University of Wisconsin–Madison, is leading a team of experts to create a patch composed of retinal cells derived from stem cells as a vision-restoring therapy for people with macular conditions such as Stargardt disease. The company Opsis Therapeutics was recently formed to advance the therapy into and through a clinical trial and out to the patients who need it. The patch consists of two layers. One layer will serve as a precursor to vision-enabling photoreceptors. Once transplanted, the stem cells of this layer will mature into photoreceptors. The other layer will consist of mature retinal pigment epithelial (RPE) cells, which provide waste disposal and nutrition for photoreceptors. A thin plastic film will serve as a structural backbone for the patch. A biodegradable gel will protect the cells and hold the layers together. The Foundation Fighting Blindness currently funds the project, and has funded Dr. Gamm for more than a decade to advance this therapeutic approach.

Emerging Pharmacological Treatment for Stargardt Disease

Vitamin A, metabolized in the retina, is essential for vision. Many researchers believe that Stargardt disease, an inherited form of macular degeneration, is caused by the accumulation of toxic byproducts caused by the metabolic process. Konstantin Petrukhin, PhD, an FFB-funded researcher at Columbia University Medical Center, is developing a compound that blocks a protein known as retinal binding protein 4 (RBP4) — doing so reduces the accumulation of toxic vitamin A byproducts. He has shown that the drug reduces these toxins in a Stargardt disease mouse model. Dr. Petrukhin is optimizing the compound for evaluation in additional preclinical studies.

High-Throughput Screening of Small Molecules Protecting Retinal Cells

Shigemi Matsuyama, Ph.D., an FFB-funded investigator at Case Western Reserve University, has used high-throughput screening to identify a small molecule that can inhibit retinal cell death. He is now conducting a medicinal chemistry program to improve the characteristics of this molecule and develop a pharmaceutically acceptable compound. If successful, his drug could be applicable to many forms of retinal disease, independent of the underlying genetic mutation.