

Breaking News from the Foundation Fighting Blindness

Now They See

Landmark Gene Therapy Provides Vision to Nearly Blind Young Adults

Three young adults with virtually no vision can now read several lines on an eye chart and see better in dimly lit settings thanks to an innovative gene therapy aiming to reverse blindness in a severe form of retinitis pigmentosa known as Leber congenital amaurosis or LCA. One person can even navigate an obstacle course that he couldn't before.

The three individuals are participating in a Phase I clinical trial at The Children's Hospital of Philadelphia, which is funded in part by the Foundation Fighting Blindness.

"I am overwhelmed with delight. We are delivering vision to people who were blind. This is the biggest advancement in the 37-year history of the Foundation Fighting Blindness," says Gordon Gund, Co-Founder and Chairman of the Foundation Fighting Blindness. "We have achieved an incredible milestone in curing blindness, and this advancement will help pave the way for the development of gene therapies to treat and cure a variety of retinal diseases including: retinitis pigmentosa, Stargardt disease, Usher syndrome, and macular degeneration. This is a great day for the Foundation and all people affected by blinding retinal diseases."

The development of the approach began when a form of LCA was linked to the RPE65 gene in 1997. Three years later, researchers began giving vision to dogs born blind from LCA, including the world-famous Lancelot. More than 50 dogs have been treated and all continue to see well. The Foundation Fighting Blindness has been funding this research virtually every step of the way.

Though the Phase I studies are primarily focused on safety, the first dose used in this study resulted in improved vision. An additional six individuals will be enrolled in a continuation of this study to evaluate safety and efficacy of differing doses. The vision improvement in young adults seen so far at the lowest dose gives researchers optimism that the treatment may provide near-normal vision to children in Phase II studies.

Results of the clinical trials, funded in part by the Foundation, were published on April 28, 2008 in the *New England Journal of Medicine*. The journal published the results of gene therapy trials taking place at CHOP and Moorfields Eye Hospital in London. A third trial of the gene therapy, sponsored by the NEI, is also taking place at the University of Pennsylvania and the University of Florida.

Jean Bennett, M.D., Ph.D., lead investigator of the CHOP trial, reports that the team studied three participants, who ranged in age from 19 to 26. All three had one eye treated.

Bennett says that all three individuals reported improved vision in dimly lit environments and in visual acuity in their injected eyes starting two weeks after treatment. Nystagmus

— the roving eye movement associated with severe vision loss from LCA — was also reduced in all three individuals.

The treatment developed by this team of investigators involves delivery of a normal RPE65 gene to the retina to augment function of the defective RPE65 gene that leads to one form of LCA. Twelve different genes that lead to LCA have been identified.

The gene is delivered using a therapeutic virus known as an adeno-associated vector or AAV.

Researchers believe the vision improvement from a single injection will last for many years. In earlier laboratory studies, a single AAV-based gene therapy in more than 50 dogs born blind from LCA has been effective for more than seven years.

This study is being carried out by an international team led by The University of Pennsylvania, The Children's Hospital of Philadelphia, the Second University of Naples and the Telethon Institute of Genetics and Medicine (both in Italy), and several other American institutions.

If you are interested in supporting the Foundation Fighting Blindness in its mission to advance research initiatives such as this study and others to cure retinal diseases, [click here](#).