Stanniocalcin for Treatment of Ophthalmic Disease

Summary

Developed through a collaborative effort between Scott & White Healthcare and the Texas A&M Health Science Center, the use of stanniocalcin (STC-1) polypeptide for the treatment of dry (atrophic) age-related macular degeneration (AMD) and retinitis pigmentosa (RP) represents an extraordinary breakthrough in the treatment of retinal degeneration (RD). Currently, there are no approved and/or effective therapies for RP or the dry form of AMD. Vision loss in these conditions is typically permanent and often progressive. Treatment of patients who are known or at risk of having these common eye diseases can provide a valuable option to help prevent progressive vision loss, thus maintaining quality of life.

Key Investigator
Robert Rosa, Jr., MD

Field
Ophthalmology

Technology
STC-1 Protein Therapy for Treatment of Retinal Diseases such as Dry AMD and RP

Key Features
- Naturally occurring protein
- Rescues photoreceptor degeneration in two rat models of RD

Stage of Development
Preclinical

Status
Available for licensing

Patent Status
US Patent 8,759,298;
US Patent 9,090,704;
Pending US Continuation

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Market

Retinal degenerations (RDs), including AMD and RP, are the leading causes of legal blindness in the United States and other developed countries. RDs affect an estimated one (1) in 2,000 individuals worldwide, and AMD affects an estimated one (1) in 3 to 4 individuals over the age of 75 years in the U.S. The overall prevalence of AMD in the U.S. population 40 years and older is estimated to be 1.47%, with 1.75 million citizens having AMD.

With the rapidly aging population, the prevalence of AMD will increase to almost 3 million by 2020. The majority of these individuals (approximately 80%) will have dry (atrophic) AMD. However, there are no approved and/or effective therapies available for dry AMD, the most common form of AMD, nor is there any approved or effective therapy for RP.

Technology

This technology is based on the finding that mesenchymal stem cells can be activated by signals from cells undergoing programmed cell death (apoptosis) to reduce the programmed cell death by secretion of stanniocalcin-1 (STC-1).

STC-1 protein was originally identified as a calcium/phosphate regulatory protein in fish, but the mammalian STC-1 protein was found to have multiple effects including protection against ischemia and reduction of inflammatory responses.

Intravitreal eye injections of STC-1 have been found to rescue photoreceptors (rods and cones) from degeneration in two different rat models of RD. Stanniocalcin therapy thus represents a promising therapy for diseases associated with photoreceptor cell loss, including dry AMD and RP.

Currently, research is being conducted to determine effectiveness of STC-1 in transgenic pig models.