Innovations
UNIVERSITY OF COLORADO
ANSCHUTZ MEDICAL CAMPUS

AmpVision

Product

Intraocular Implantable Device

Indication

Degenerative ocular disease

Value Propositions

- Long-term suppression of inflammation
- Novel therapeutic approach
- Inserted via 25-gauge trocar in office

Market

- $29.5 billion—Global ophthalmic disease therapeutic market (6.1% CAGR 2018-2026)

Intellectual Property

- Issued US Patent*
- Available for licensing

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Background on CU3368H

Every day in the industrialized world, age-related macular degeneration (AMD) patients with exudative or "wet" disease receive uncomfortable eye injections monthly to prevent blindness. For patients with the dry non-exudative form, there are no current treatment options. Dry AMD is the leading cause of vision loss in patients over 55 years of age, with currently 11 million patients in the US, and the prevalence is expected to increase dramatically commensurate with aging of the baby boomer generation. Diabetic Retinopathy (DR) is another degenerative retinal disease that afflicts 10 million people in the US alone. A technology that could both 1) slow the progression of these diseases, and 2) decrease the injection burden, would be of enormous economic benefit. For wet AMD and DR, several drugs have been developed that prevent the formation of new blood vessels in the eye, by blocking the VEGF receptor. However, these drugs do nothing to treat the underlying overactive inflammatory process in the eye. For the dry form of AMD, there are no approved treatments at this time.

Technical Innovation

Jeff Olson with researchers in the Department of Ophthalmology have developed a unique implantable technology which adsorbs inflammatory complement proteins in the vitreous humor of the eye. The technology turns drug delivery upside down: rather than injecting proteins into the eye to target other pathologic proteins, we are directly removing the target proteins. The intraocular implant is composed of polyacrylontrile (PAN) polymer, which can dialyze several complement proteins associated with chronic inflammation. Calculations of the adsorption capabilities of these fibers suggest that the dialysis could persevere for over a year in situ. Thus, this implant could reside in the eye for months to years, lasting much longer than drugs which must be injected into the eye monthly. Finally, while most drugs target one, sometimes two proteins, PAN fibers have an affinity for several proteins in the complement pathway.

Defender Dual Trocar and Insertion Tool

Figure: Prototype of the dual trocar insertion tool loaded with the intraocular filter device called "Defender". The device has been successfully deployed hundreds of times into bovine, murine, and human eye bank eyes. Intraocular biocompatibility of the material with sustained intraocular placement has been demonstrated for over 12 months in three different species: mouse, rat, and rabbit. The PAN device is well tolerated, eliciting no inflammatory response and no adverse effects on retinal anatomy or physiology

**US Patent 10,518,002—"Intraocular Drug Delivery and Filter Device and Methods of Using Same"—Filed December 31st, 2019.*