Anti-RHOB (Use 2)
Novel Treatments for Macular Degeneration and Other Retinopathies

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Unmet Need

Age-related macular degeneration (AMD) is the leading cause of irreversible blindness and visual impairment in the world. It strikes mostly people age 60 or older. AMD causes an irreversible destruction of the macula, the part of the retina responsible for vision, thereby leading to vision loss. LIMR technology specifically address the *wet* form of AMD caused by abnormal leaky blood vessels that overgrow the macula. Current treatments for wet AMD fail many patients, often later during treatment, defining a key medicinal gap.

Opportunity

LIMR researchers have defined new medicinal uses for two classes of drugs at different stages of development.

- First, oral drugs that inhibit the IDO1 enzyme, originally pioneered at LIMR in the 2000s for cancer treatment, have been discovered to block the abnormal growth of blood vessels that are known to cause macular degeneration.
- Second, a cell-permeable antibody developed at LIMR that targets the signaling protein RhoB was discovered to have therapeutic properties in the same setting, in this case as an injectable drug.

US demographics will drive growth in the market for AMD treatments in coming years. Currently, 11 million Americans suffer from AMD. According to the nonprofit organization BrightFocus Foundation, that number is expected to double by 2050. More dramatically, AMD cases worldwide are expected to grow from 196 million in 2020 to 288 million by 2040.[1]

Other possible applications for these LIMR technologies include treatment of diabetic retinopathy (DR), which can develop in anyone who has either type 1 or 2 diabetes, and is a leading cause of blindness among working-age adults. The number of vision-threatening cases of DR worldwide is predicted to increase from 37.3 million in 2010 to 56.3 million by 2030.

Our technologies could also be used to treat other retinopathies, such as macular edema, diabetic macular edema, and myopic choroidal neovascularization.

Unique Attributes

IDO1 inhibitors and anti-RhoB antibodies each act by novel mechanisms of action not utilized by existing drugs.

[1] BrightFocus Foundation, Clarksburg, Maryland. 16 January 2016.

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Clinical Applications

Potential new treatment for wet macular degeneration, diabetic retinopathy and other retinopathies (macular edema, diabetic macular edema, myopic choroidal neovascularization)

Stage of Development

Preclinical proof of concept for uses of IDO1 inhibitors and anti-RhoB antibodies to effectively treat wet macular degeneration has been published or submitted for publication.

Intellectual Property

- Anti-RhoB antibodies: U.S. Patent No. 9,879,092, issued 30 January 2018.
- Patent pending: New use for Anti-RhoB antibodies.
- Patent pending: New use for IDO1 inhibitors (daily oral monotherapy).

Collaboration Opportunity

Seeking licensee for commercialization or collaboration to complete preclinical studies.

References and Publications

- Mondal A, Smith C, DuHadaway JB, Sutanto-Ward E, Prendergast GC, Bravo-Nuevo A and Muller AJ. (2016) IDO1 is an Integral Mediator of Inflammatory Neovascularization. EBioMedicine 14:74-82.
- Almonte-Baldonado R, Bravo-Neuvo A, Benjamin LE, Gerald D, Prendergast GC and Laury-Kleintop LD. RhoB antibody inhibits pathogenic vascularization in a murine model of retinopathy. J Cell Biochem, in revision. Preprints available upon request.

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