

Opportunity

Seeking a licensing and development partner to advance the program to clinical studies and onward towards commercialization

Development Stage

Demonstrated efficacy in vivo glaucoma animal models for IOP reduction and neuroprotection studies.

Intellectual Property

Provisional Patent Application Status: Filed

Publication

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NeuProIO: A dual-Action Solid Drug Nanoparticle Topical Formulation for Simultaneous Intraocular Pressure Reduction and Neuroprotection for Glaucoma

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PROBLEM STATEMENT

Glaucoma is the leading cause of blindness worldwide with around 80 million affected worldwide. For those suffering from glaucoma, using eyedrops is the least invasive method for symptomatic relief. Current eyedrop products are solely targeting intraocular pressure (IOP) reduction. However, IOP reduction alone is insufficient to halt disease progression. A significant proportion of glaucoma patients still experience progressive damage to retinal ganglion cell (RGC) and the optic nerve even following IOP-lowering treatments. There is an unmet need for novel ocular drug formulations that can simultaneously target IOP reduction and neuroprotection.

SOLUTION

Researchers at Missouri University of Science and Technology and Stanford University have developed a new solid drug nanoparticle (NeuProIO) with two active agents, a neuroprotectant maprotiline and a beta-adrenergic blocker betaxolol. NeuProIO has shown improved biosafety, ocular biocompatibility, tissue permeability, sustained intraocular pressure (IOP) lowering and neuroprotective effect. More importantly, betaxolol in NeuProIO synergistically improved the delivery of the maprotiline to the posterior eye after topical administration, thereby enhancing its neuroprotective effect.

VALUE PROPOSITION

NeuProIO emphasizes scalable manufacturing, ease of administration, improved ocular biocompatibility, enhanced bioavailability, and simultaneous IOP reduction and neuroprotection. This innovation not only sheds new light on the potential of combination therapy in glaucoma treatment but also presents a scalable solution for the industrial production of advanced ocular drug formulations, ultimately improving patient outcomes and compliance.

