Pre-clinical Testing of Sustained Release of Dasatinib to Prevent the Major Blinding Complications Following Eye Injury

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TECHNICAL ABSTRACT

Background: Prevention of proliferative vitreoretinopathy (PVR), the major complication following traumatic eye injuries, is critical due to poor results in restoring visual acuity of PVR patients. While currently clinical treatment to prevent PVR is lacking, we have demonstrated that multiple intraocular injections of dasatinib, a Food and Drug Administration-approved cancer medication, prevents PVR in vivo in a swine model that reproduces key features observed in humans. However, the high frequency of intravitreal injections is a logistical challenge, and thus, a different method for the intravitreal application of dasatinib would be valuable.

Objective/Hypothesis: The objective of the proposal is to develop a sustained release mechanism for dasatinib using poly(lactic-co-glycolic acid) (PLGA) that can be introduced into the eye to prevent PVR. We hypothesize that a single application of dasatinib-incorporated PLGA microparticles (dasatinib-PLGA), capable of sustained release of dasatinib, can prevent PVR.

Specific Aims: (1) To produce and characterize dasatinib-PLGA in vitro. (2) To prevent PVR, without any