**PYK-1105: Pre-Clinical Evaluation Of A Novel Biodegradable Vitreous Substitute For Retinal Tamponade**

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**Purpose:**

Current retinal tamponade strategies are limited by anatomic considerations (retinal break location), durability (short term versus need for removal), and patient adherence (positioning, travel/altitude restrictions). Here we describe the pre-clinical safety and toxicology of a novel biodegradable hydrogel tamponade agent (PYK-1105) with the potential to improve both patient experience and outcomes after retina surgery.

**Methods:**

We studied *in vitro* performance to assess hydrogel gelation time, modulus, viscosity, degradation time, refractive index and transmittance. In addition *in vitro* and *in vivo* (mice and rabbits) biocompatibility testing was performed to assess cytotoxicity, intraocular irritation, acute systemic toxicity, genotoxicity, and pyrogenicity. Furthermore, clinical safety was assessed using *in vivo* (rabbits and minipigs) response to vitrectomy with PYK-1105 insertion with the following measures: clinical exam, multi-modal imaging, full-field electroretinography, and histopathology.

**Results:**

PYK-1105 met the pre-defined performance testing criteria for optimal tamponade and demonstrated excellent biocompatibility. Animal studies showed the PYK-1105 formulation to be well-tolerated and non-toxic in mice, rabbits, and pigs.

**Conclusions:**

PYK-1105 holds promise as a new biodegradable tamponade agent that has the potential to improve both the patient experience and outcomes after retina surgery. Human pilot studies are warranted to further assess for safety and efficacy.