

Figure 1. Key reasons why a small percentage of viable cells make it to the target site.

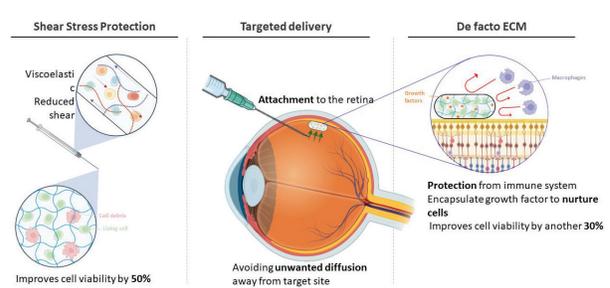


Figure 2. InGel addresses the challenges of cell delivery in the eye with its technology.

## A New Hydrogel for Ocular Delivery



### Michael Young, PhD

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Dr. Young's work focuses on the degeneration that occurs in the retina during disease or injury. He is currently studying human retinal stem cells with the goal of transplanting these cells to the diseased eye to establish functional connectivity between donor retinal stem cells and the mature, diseased host retina.

The Young Lab developed InGel technology to address the challenge of delivering stem cell therapies to the eye due to the low viability and attachment of transplanted cells. The huge efficacy gap seen between in vitro cell study and in vivo transplantation is caused by the use of phosphate buffer saline as an excipient for cell injection. To address this problem, we have created a biomimetic delivery system which enhances the viability and attachment of cells both in vitro and in vivo. This matrix possesses a low-immunogenicity, and can be finely tuned for the encapsulation of various types of therapeutics (stem cells, small molecules, or proteins) offering a sustained release (from five days to five months) and targeted delivery in the eye.

In vitro preliminary data showed a consistent improvement in retinal stem cells (photoreceptor progenitors, ganglion cells, RPE, fetal retina, hRPC) viability and phenotype when cultured in our biomatrix. Proof of concepts for safety and efficacy in vivo have been performed in multiple rodent studies (three rodent models) for various indications including Retinitis Pigmentosa and Glaucoma, which require stem cell transplantation for regenerative medicine. Low-immunogenicity has been shown with the injection of our matrix in both the vitreous and subretinal space without detectable immune reaction.