In the tissue engineering lab we combine engineering approaches in microfabrication with biological methods to develop realistic and accurate in-vitro models of retinal tissues. We use these models to better understand the mechanisms of initiation and progression of retinal diseases, such as Age-related Macular Degeneration (AMD), the leading cause of adult blindness in developed countries.

The main focus of our research is to understand the role of physical changes that occur during the early stages of retinal degeneration in pathogenic angiogenesis in eyes of AMD patients. Specifically, we use in-vitro models to study the effect of cell-cell interactions and mechanical stress on the behavior of retinal pigment epithelial cells. Elucidating the mechanisms of molecular changes during the early stages of AMD could lead to novel therapeutic interventions to prevent and treat retinal degeneration and to improve the life quality of the 2 million AMD patients.