The Applied Ophthalmic Neurobiology Laboratory studies control mechanisms regulating ocular physiology and development. Major efforts have addressed the mechanisms responsible for myopia (nearsightedness) and ways to prevent it. The laboratory has also addressed neural and local mechanisms that influence intraocular pressure and, most recently, the ocular surface. Methodologically, the laboratory applies methods from neuropharmacology and neuroanatomy to the eye.

**Neuropharmacology of myopia**
The laboratory introduced pharmacological methods to the study of refractive development. It has identified several signaling pathways that appear to be involved in controlling eye development, a number of which have now been extended to children. These include the identification of a drug inhibiting myopia progression in children, the first such clinical innovation in several centuries, and the idea that the daily light-dark cycle might influence eye development.

**Ocular Innervation**
The laboratory played a leading role in identifying neuropeptides in the nerves supplying tissues throughout the eye. More recently, the lab has addressed a variety of local signaling systems in the eye.

**Goals**
Currently, the laboratory is applying molecular biology techniques to study the patterns of altered gene expression in experimental refractive errors and addressing receptor systems that it has recently identified as influencing refractive development. In a related project, it is characterizing a novel signaling system in the cornea recently identified as part of its myopia research.