Our research group, the Unit on Neuron-Glia Interactions in Retinal Diseases (UNGIRD), of the Laboratory of Retinal Cell & Molecular Biology investigates the role of microglia, the resident immune cell of the retina, in normal physiological function and in the pathogenesis of retinal diseases. Of particular interest are retinal diseases in which age-related neuroinflammation features prominently, such as diabetic retinopathy and age-related macular degeneration (AMD), which are responsible for the majority of vision loss in the developed world. Our key areas of focus are: 1) the role of microglia in the basic physiological function of the retina, and cell-cell interactions between microglia and other retinal cell types, 2) the aging phenotype of the retinal microglial cell, 3) the role of microglia in the pathogenesis of retinal disorders, and 4) translational research on microglial-based therapies in preclinical and proof-of-concept phase I/II clinical trials. Our laboratory has used a combination of live-imaging techniques, in vitro studies, and animal models of disease to investigate the involvement of microglia in intercellular interactions with other retinal cell types in healthy, aging and pathological conditions. One key motivation is to understand how these cellular interactions undergo progressive change during senescence, resulting in age-related neuroinflammation that drive retinal disease pathogenesis. We are interested in discovering the molecular bases for these cellular interactions which allow the discovery of therapeutic targets directed at retinal microglia. The group is currently involved in a number of phase I/II trials using microglial inhibition as a treatment for diabetic retinopathy and retinal vein occlusions.