

Regulation of retinal basal glia differentiation in *Drosophila* eye disc

Y. Henry Sun^{1,2}, Chia-Kang Tsao^{1,2}, Yu Fen Huang^{1,2}

1. Department of Life Sciences and Institute of Genome Sciences, National Yang-Ming University, Taipei, Taiwan, Republic of China

2. Institute of Molecular Biology, Academia Sinica, Taipei, Taiwan, Republic of China

The retinal basal glia (RBG) is a group of glia that migrates from the optic stalk into the third instar larval eye disc while the photoreceptor cells (PR) are differentiating. There are three major classes of RBG, namely surface glia (SG), wrapping glia (WG) and carpet glia (CG), based on molecular and morphological characteristics. The SGs migrate and divide. The WGs are postmitotic and wraps around PR axons. There are two CGs per eye disc and they have giant nucleus and extensive membrane extension that each covers half of the eye disc. It has been proposed (Silies et al., 2007, J Neurosci 27:13130-13139) that the SGs migrate under the CG membrane, which prevented their contact with the PR axons lying above CG membrane. Upon passing the front of the CG membrane, which lags slightly behind the morphogenetic furrow marking the front of PR differentiation, the migratory SG can contact the nascent PR axon and be induced to differentiate into WG. We have developed an ex vivo culture system to follow the migration, division and differentiation of RBGs by live imaging. We found that SGs are migrating and dividing both above and below the CG membrane, thus the CG membrane cannot be a physical barrier to prevent contact between SG and PR axon. We will present new findings, based on live imaging, lineage analysis and genetic manipulations, suggesting a novel mechanism for the regulation of the SG-to-WG transition by CG.