Yorkie facilitates cell survival during larval eye development in *Drosophila melanogaster*

Brooke M. Allen[1], Tiffany Cook[2], and Jacob D. Kagey[1]

1. Biology Department, University of Detroit Mercy
2. Center for Molecular Medicine and Genetics, Wayne State University

Introduction:

- YAP1, the human homolog of Yki, is a transcription factor that has been found to be highly expressed and localized in the nucleus of several human cancers.
- Previous studies have shown Yki to be involved with cell survival, cell growth and cell proliferation, though many of those studies have been in genetic systems in which Yki is overactive.
- We are investigating the developmental role of *Yki* in the *Drosophila* eyes in various stages of eye development, hypothesizing that *Yki* is primarily essential for survival.

Figure 1: Knockdown of Yki results in increased apoptosis

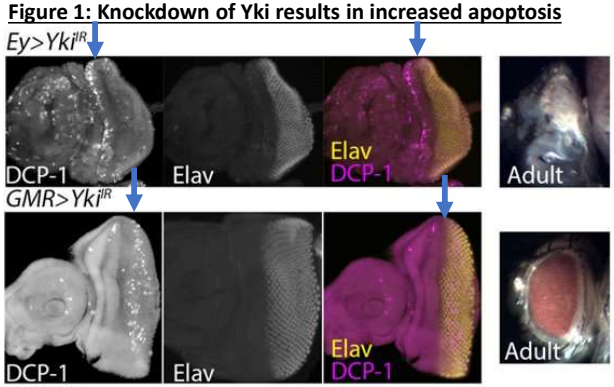

Figure 1: Knockdown of *Yki* in various stages of eye development results in small eye phenotype due to increase in apoptosis. Gene expression of *Yki* was knocked down in early and later eye development. DCP1 expression is increased in both knockdown larval discs, indicating that *Yki* is essential for survival.

Figure 2: Inhibition of apoptosis rescues Yki clone size

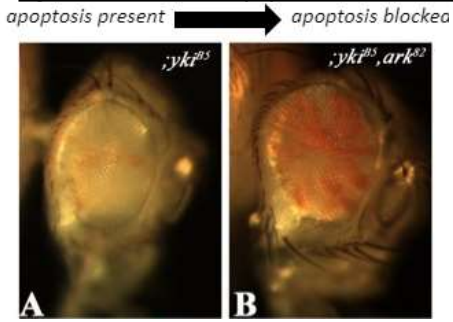

Figure 2 Inhibition of apoptosis in *Yki*. When apoptosis is blocked there is rescue of the clone size in tissue presented in pigmented tissue of adult eyes.

Figure 3: Pupal eye disruption in *Yki* and *Sd* knockdown

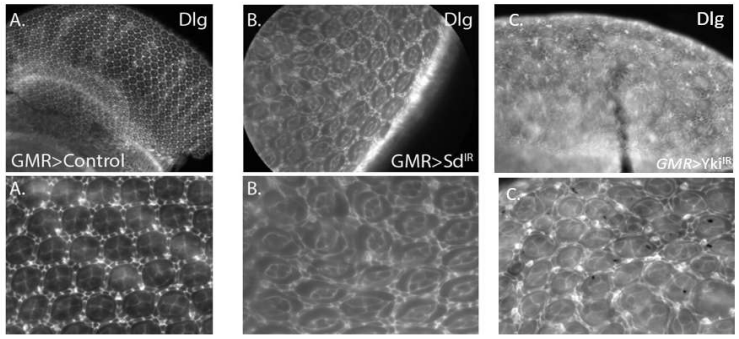

Figure 3: Pupal eye disruption with the knockdown of Yki and its confirmed binding partner, Sd. All pupae were dissected 24-40 APF. A. Control eye disc. B. *GMR*>Sd discs were dissected and stained with Dlg. C. *GMR*>Yki discs were dissected and stained with Dlg.

Figure 4: Ommatidial expression across Yki/Dark clones

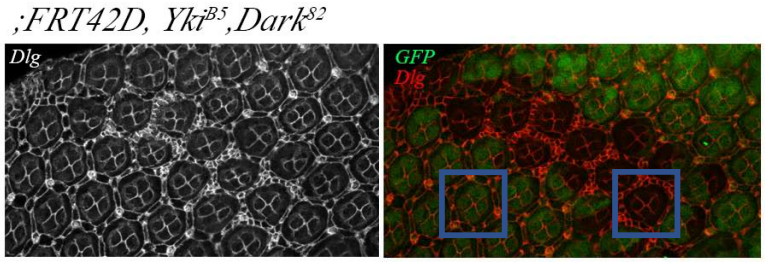

Figure 4: Ommatidial expression across clones is not disrupted. In pupal mosaic eyes, ommatidial expression is not disrupted across wild type and mutant tissue. The clones have additional interommatidial cells present.

Figure 5: Investigating other roles of *Yki* in larval eye development

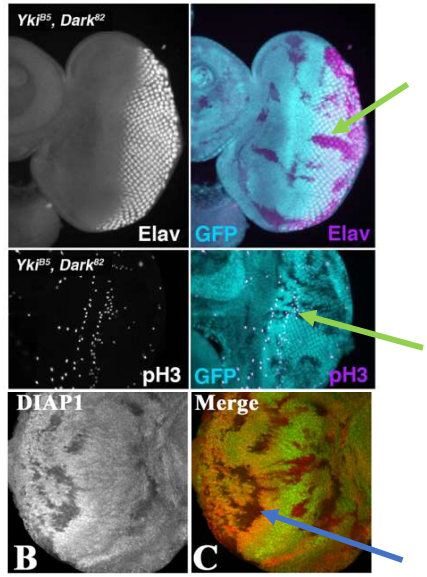

Figure 5. *Yki* effect on mitosis, differentiation, and transcriptional target DIAP1. Upon the inhibition of apoptosis, the role of *Yki* in mitosis and differentiation during larval eye development was tested. Expression patterns of Elav and pH3 did not vary across wild type and mutant tissue. Increase in apoptosis coincides with a decrease in DIAP1 expression in mutant clones.

Discussion:

- Yki is essential for survival.
- Blocking apoptosis rescues clone size in mosaic eyes.
- Yki does not facilitate mitosis or neuronal differentiation during larval eye development.
- *Yki* transcriptional target gene DIAP1 has decreased expression in clone tissue.
- Pupal ommatidial expression is not disrupted across clones.
- Additional interommatidial cells are present in clone tissue.

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