

Studying spatiotemporal gene expression in real time and lineage cells in *Drosophila* eye using G-Trace reporter system



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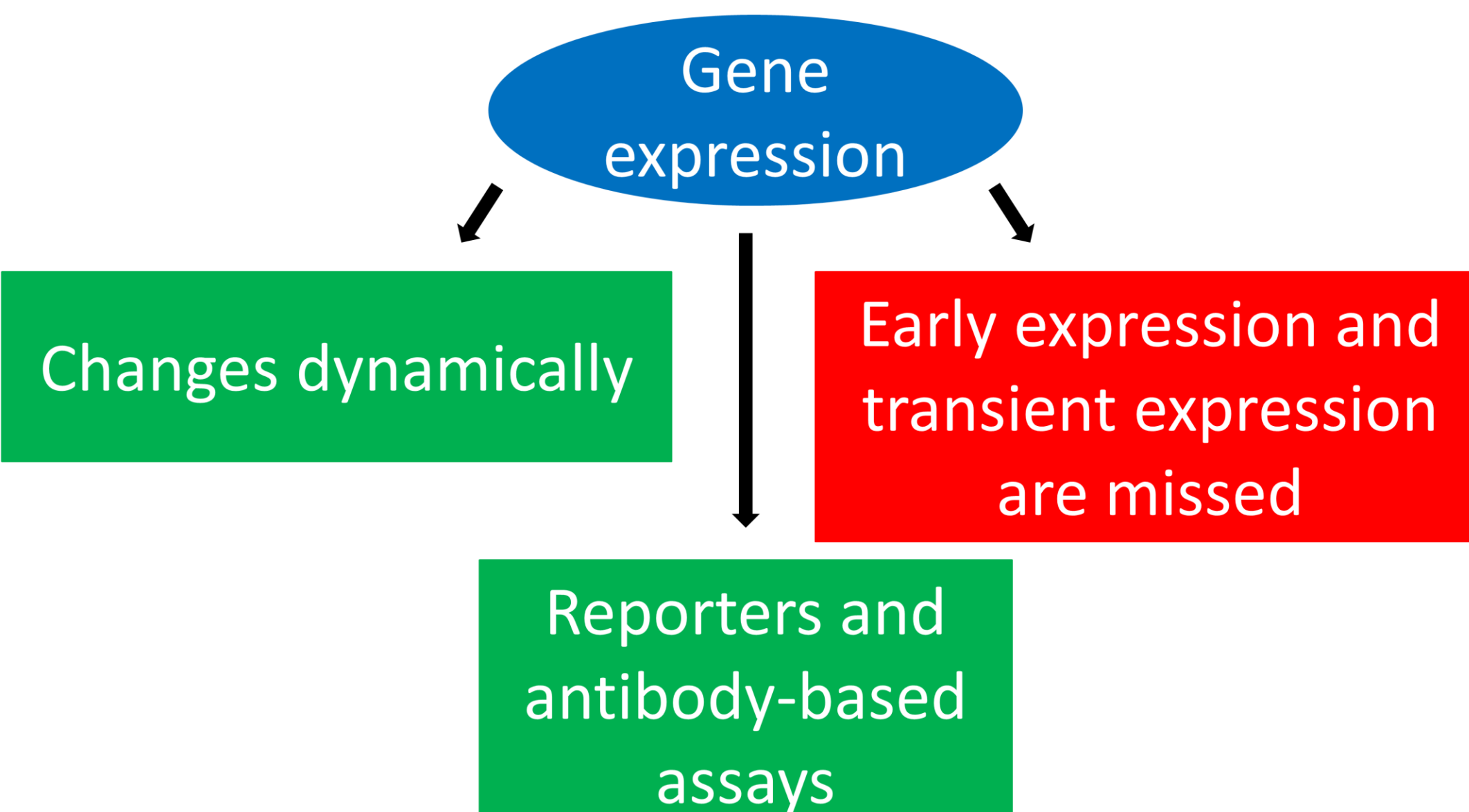


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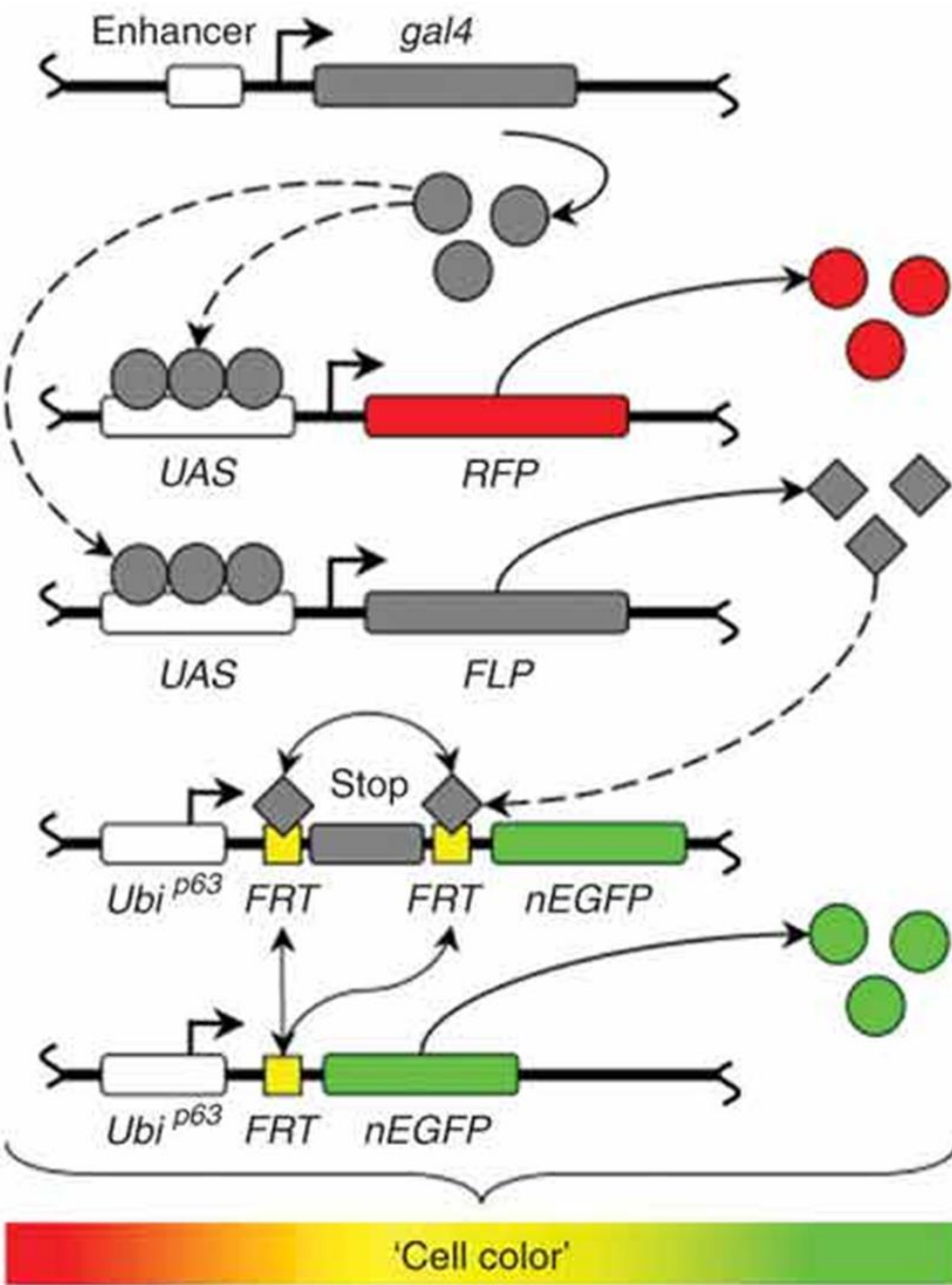
Abstract

All multicellular organisms show strictly controlled transcriptional regulation that determines differential gene expression along the spatiotemporal axis. This dynamic spatiotemporal gene expression determines the variation in cellular structure and functions and also their interaction with other genes or proteins in cells. So far, GFP or LacZ based reporter systems have been widely utilized in *Drosophila melanogaster* to study such gene expression changes. Alternatively, antibody based immunohistochemical approach is also used to determine protein localization pattern in tissues. But such approaches pose a challenge when studying transient or very early expression patterns. Therefore, we have utilized a genetic system that combines Gal4/UAS, FLP/FRT and fluorescent reporters to provide information about spatial, temporal, and lineage expression of genes. When crossed with a Gal4 stock, the Gal4 Technique for Real-time and Clonal Expression (G-TRACE) will reveal real time RFP expression, and ubiquitous lineage-traced GFP expression. Here, we utilize this method to study some of the genes that play an important role during eye development.

Rationale



G-TRACE System

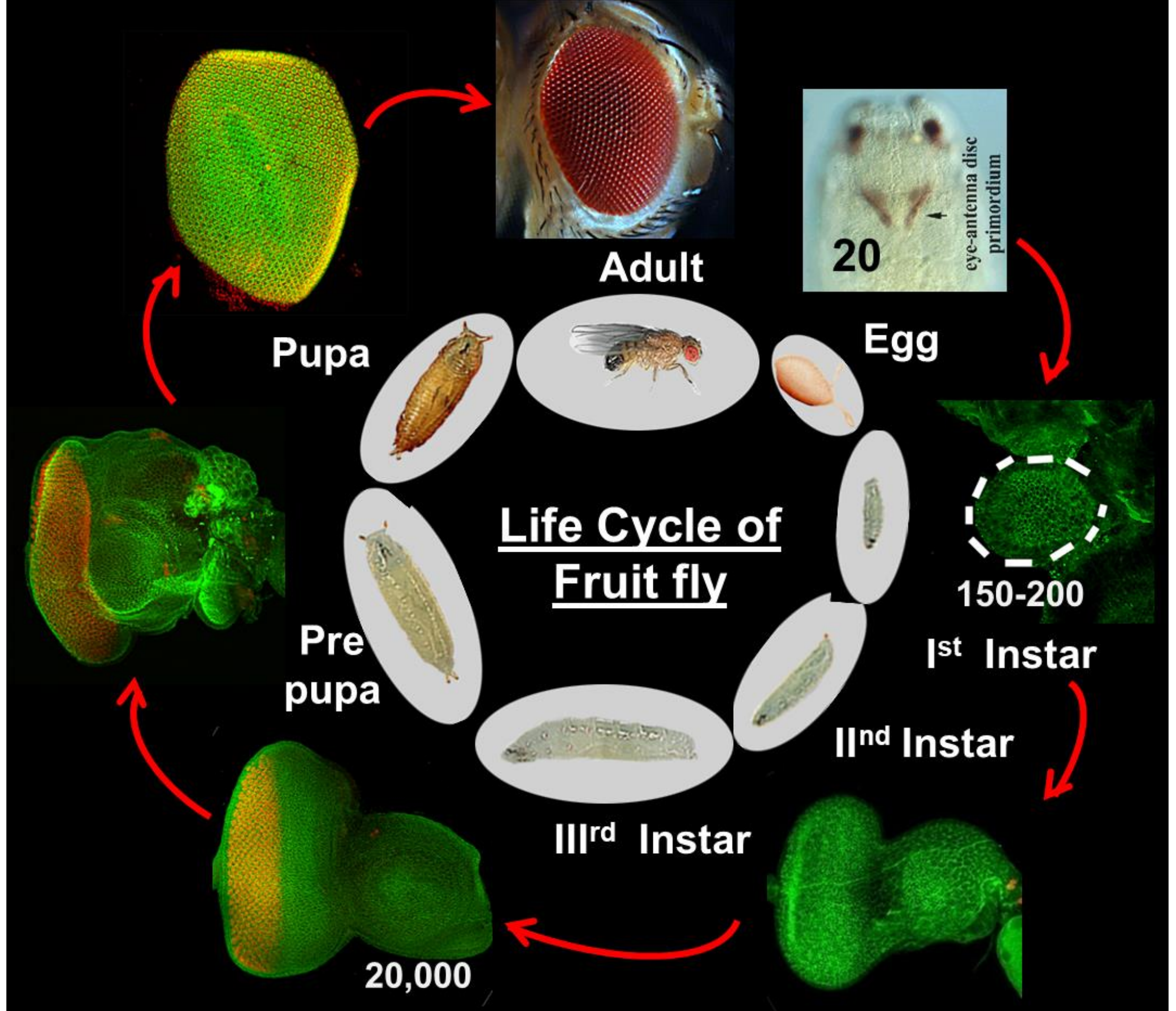


Evans et al., 2009

Anticipated results and advantages

- Transient expression patterns that are missed while performing antibody-based or reporter assays can be identified.
- This information can be used to spatiotemporally express transgenes in specific cells or time points using temperature sensitive Gal80 systems.
- It can be used to track cell lineages during development.

Drosophila eye development



Acknowledgements

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