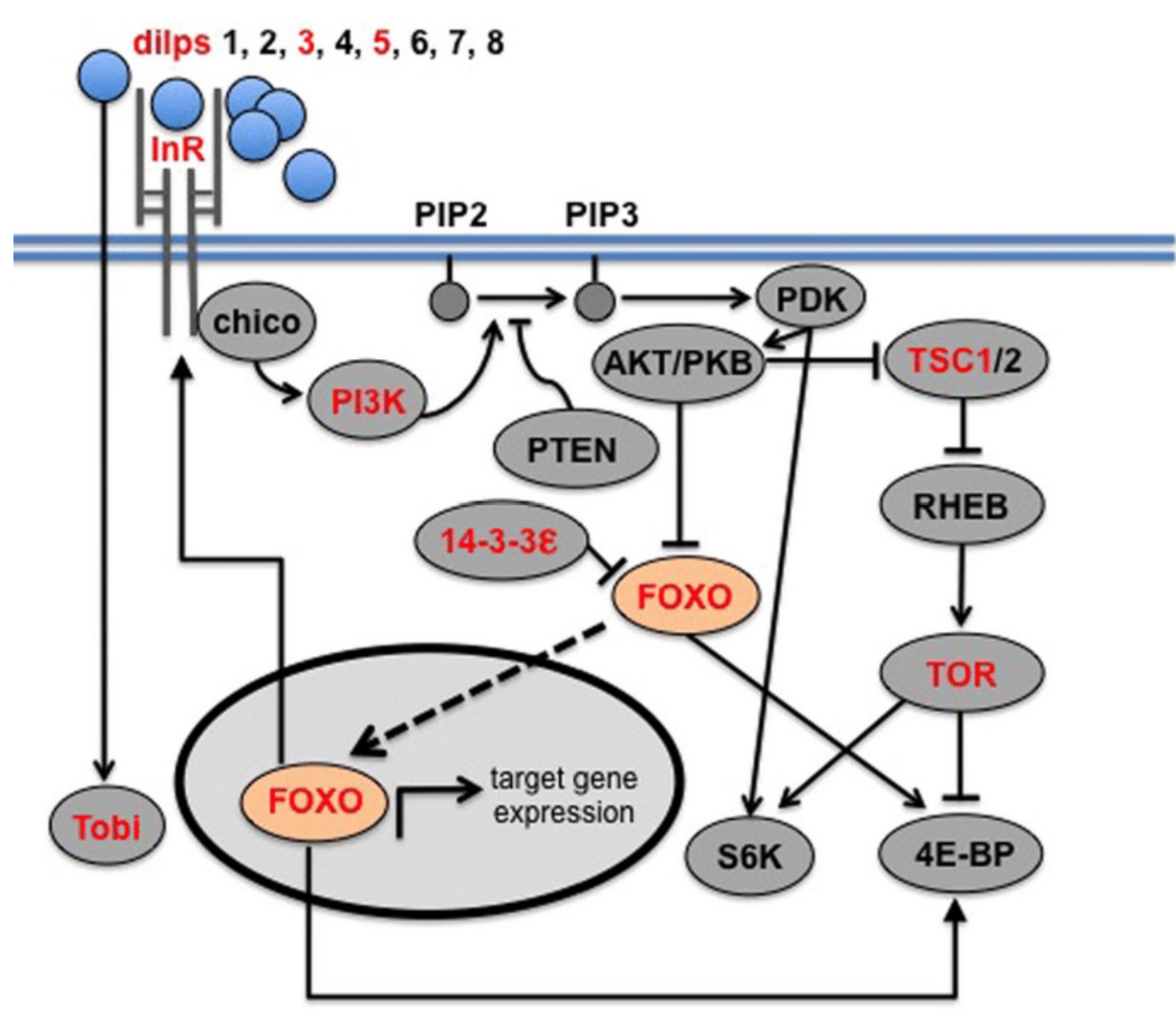


Genetic Annotation and Evolutionary Rate of *CHICO* in *D. rhopaloa* and *D. miranda*



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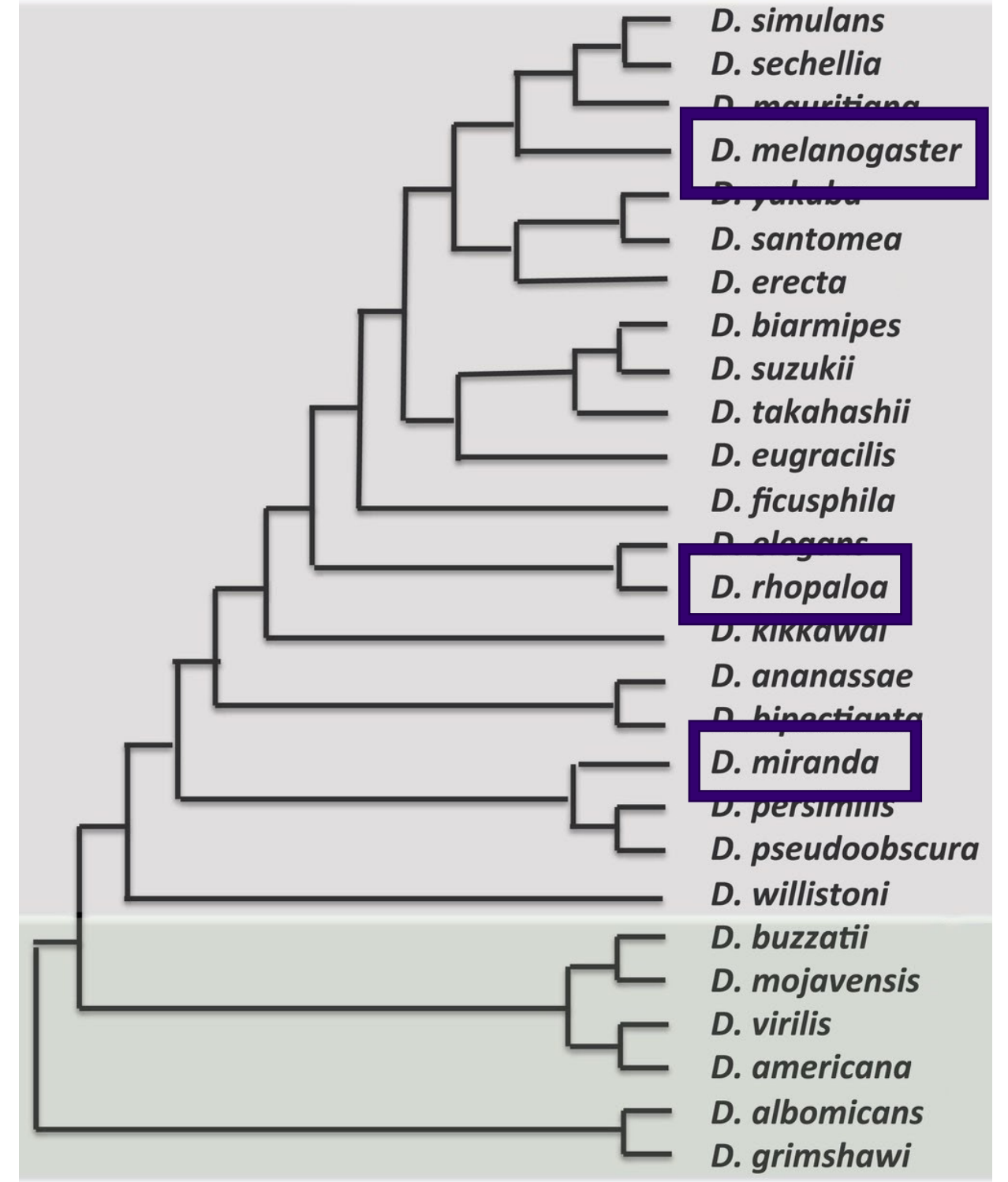
CHICO Background



- Insulin Signaling Pathway functions to regulate glucose metabolism and other aspects of homeostasis.
- *CHICO* encodes for co-receptor protein that communicates a signal that is passed on to phosphoinositide 3-kinase (PI3K).

Research Objectives

- Analyze the evolution of the *CHICO* gene in three different *Drosophila* species, including *D. melanogaster* (reference), *D. rhopaloa*, and *D. miranda*.
- Through comparing distant relatives within the *Drosophila* species, we will be able to analyze the evolutionary rate of the *CHICO* gene.



Hypothesis

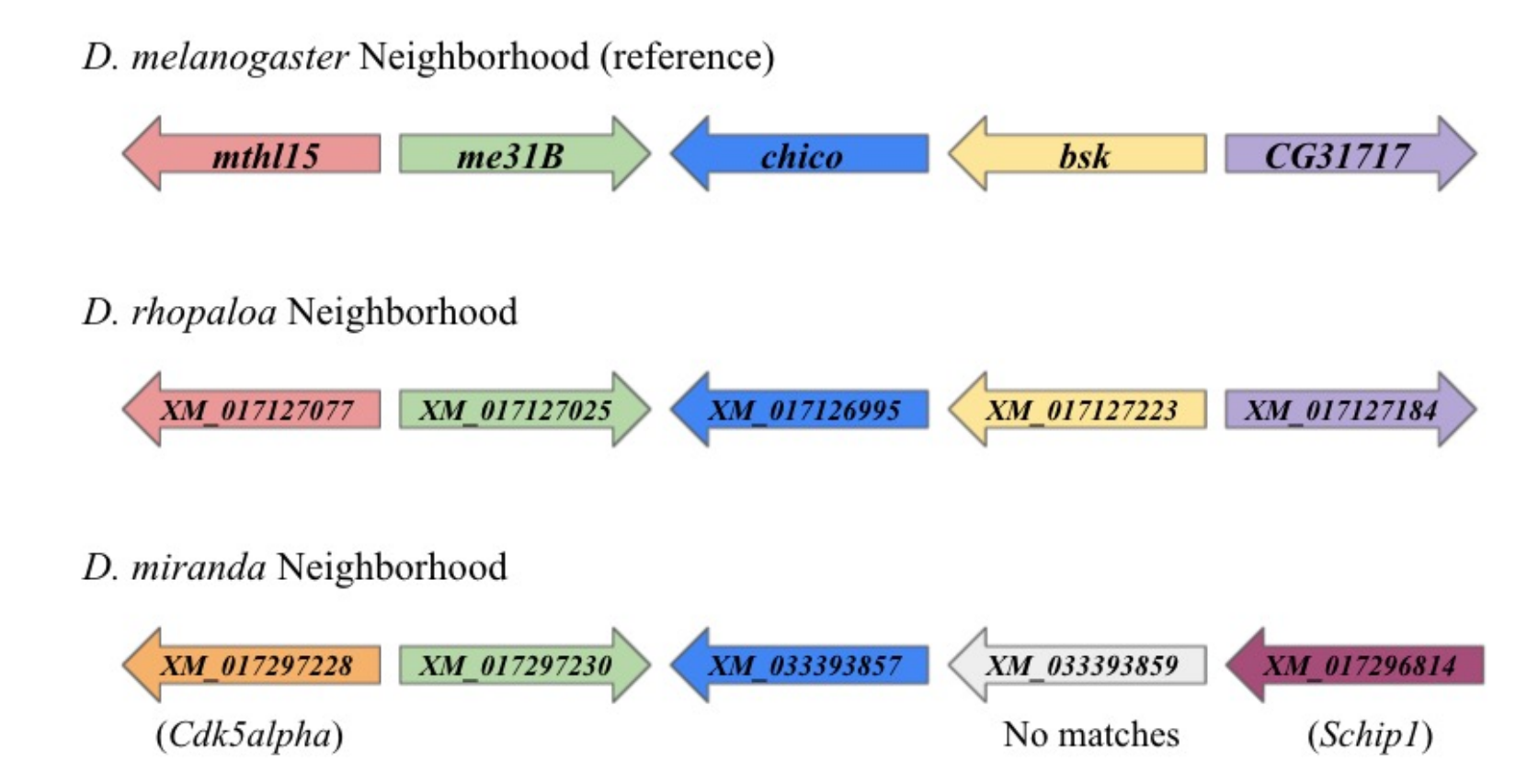
Evolutionary rates are directly impacted by the location of the gene (for my project *CHICO*, and for others the *P10* and *FOXO* genes) in the insulin signaling pathway and the phylogenetic distance of the *Drosophila* species.

Experimental Design

- 1st: Analyze genomic neighborhoods.
- 2nd: Annotate coding DNA sequence of *CHICO* in target species.
- 3rd: Align encoded amino acid sequences.
- 4th: Analyze evolutionary distances with *D. melanogaster CHICO* using MEGA X.

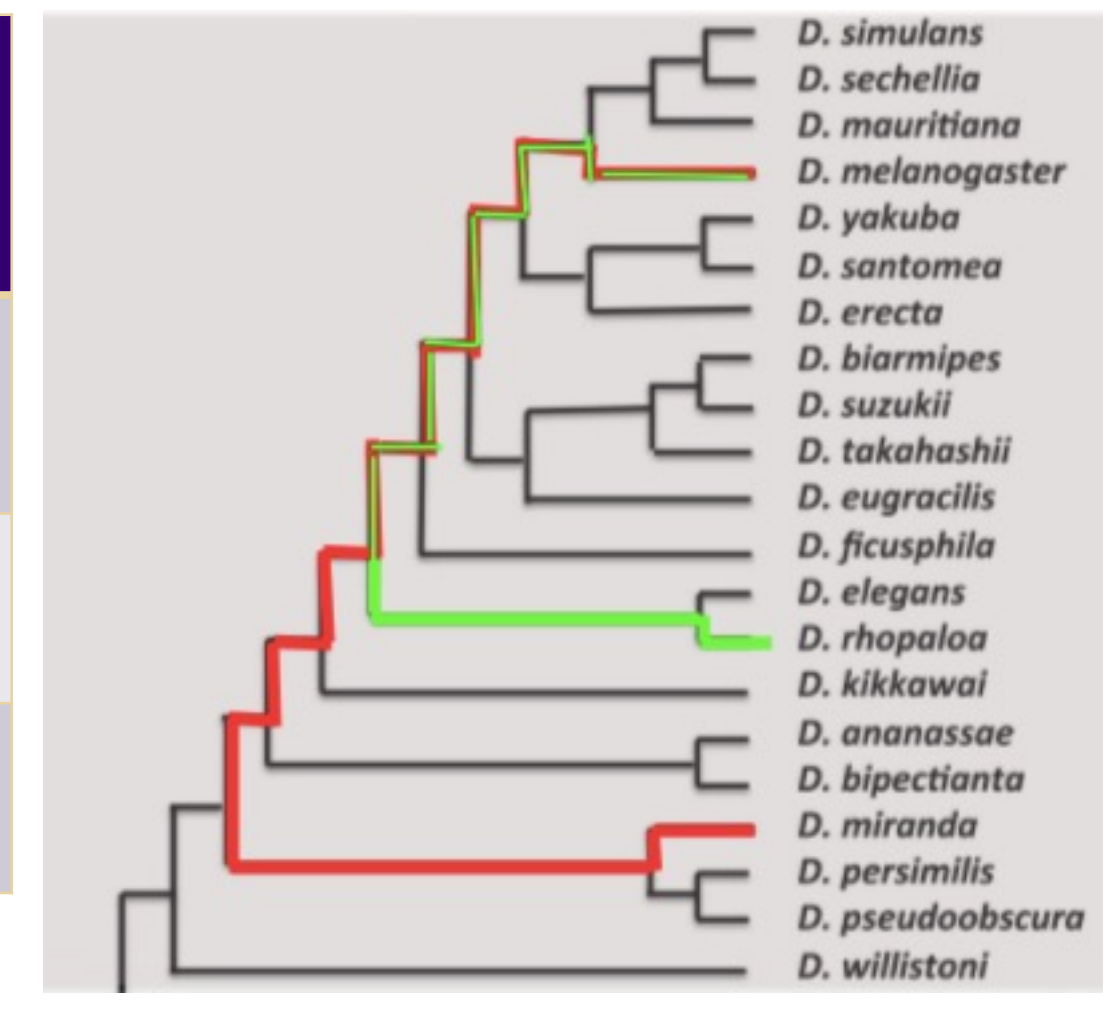
Results

We were successful in identifying these orthologs and was able to annotate the coding DNA sequence of those orthologs.

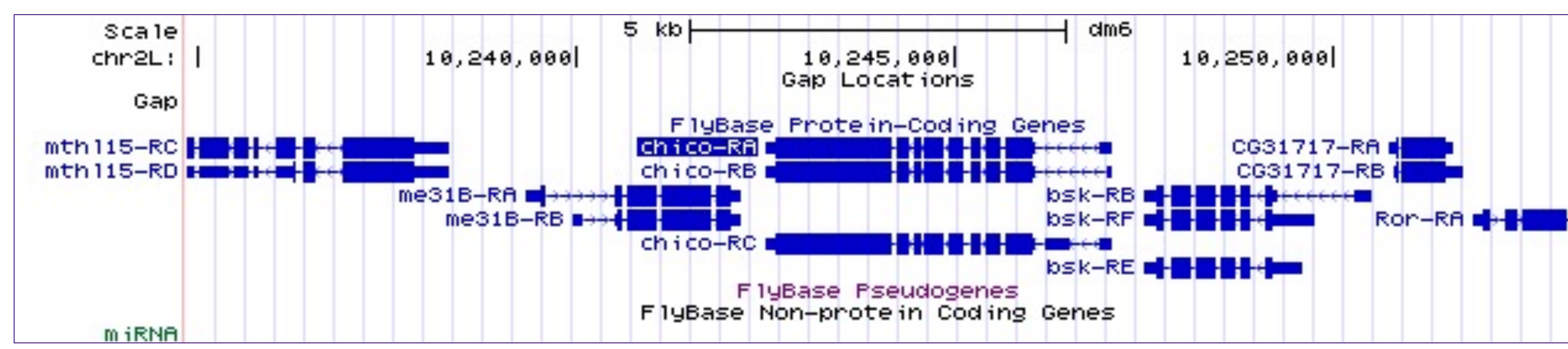


MEGA X Alignment Analysis

Drosophila Species	Per Amino Acid Substitution Rate
<i>D. melanogaster</i>	0 (Reference)
<i>D. rhopaloa</i>	0.156
<i>D. miranda</i>	0.363



Shown to the right: The genomic neighborhood of *CHICO* in *D. melanogaster*.



Conclusion

The *CHICO* ortholog in *D. miranda* had higher rates of substitution than *D. rhopaloa*, as predicted by phylogenetic distance. In the future, we hope to be able to compare *CHICO* to the *P10* and *FOXO* genes.