

**Behavioral analysis of exploration and dispersal in
*Drosophila***

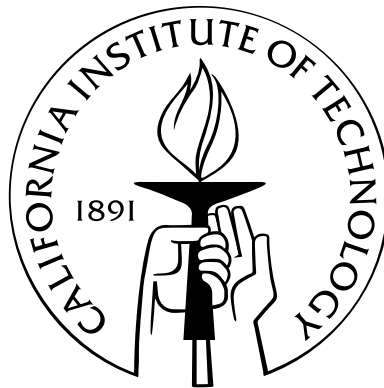
Thesis by

Jasper Chen Simon

In Partial Fulfillment of the Requirements

for the Degree of

Doctor of Philosophy



California Institute of Technology

Pasadena, California

2010

(Defended August 28, 2009)

© 2010

Jasper Chen Simon

All Rights Reserved

To my parents and grandparents, who got me this far.

Acknowledgements

I owe much gratitude to my advisor, Michael Dickinson, who pushed me to become a better scientist, a clearer communicator, and a more careful thinker. I would also like to thank the rest of my committee: Paul Sternberg, Seymour Benzer, Christof Koch, Pietro Perona, and Ralph Greenspan, for their time and helpful suggestions. Working with the late Seymour Benzer was inspiring, and his curiosity was contagious. I will never forget the casually intense discussions of politics, food, and culture that each week were the prologue to his lab's group meeting; nor will I forget the times he invited me into his personal lab space to work late into the night. He is truly missed.

I thank Paul Sternberg, David Anderson and Gilles Laurent for inviting me to carry out rotations in their labs during the first two years of my studies. In addition to getting a chance to experience the differing research programs in each of their respective labs, during these rotations I met many of the folks who guided and helped me during my graduate tenure. I would especially like to thank Nadeem Moghal, René Garcíá, Gary Schindelman, Cheryl Van Buskirk, John "DeMo" DeModena, Tim Lebestky, Mark Zylka, Walter Lerchner, Anne Hergarden, Liming Wang, Glenn Turner, Ben Rubin, Alex Bäcker, Vivek Jayaraman, Ofer Mazor, Sijin Cassenaer, Maria Papadopoulou, Anusha Narayan, Bill Ja, David Walker, Dan Tracey, and Greg Suh.

I would also like to thank Mark Konishi, Erin Schuman, and Elliot Meyerowitz for supporting my efforts in starting the animal behavior interest group (ABIG), and

Allyson Whittaker for helping me pull ABIG off. I thank all of the speakers from on and off campus who shared their work and ideas during the group's seminar series.

Thank you fellow Dickinson fly wranglers for a warm, meaningful, and mind-expanding graduate school experience. My experience would not have been as exceptional had it not been for the guidance, support, and camaraderie of Will Dickson, Mike Reiser, Allan Wong, Gaby Maimon, Gwyneth Card, Andrew Straw, Kristin Branson, Wyatt Korff, Seth Budick, and Alice Robie.

I could not have started nor finished this body of work without my family, old friends, and the many friendships born during my time at Tech. I am especially grateful to the following folks: Gaby Mosconi, Mike Vondrus, Rob Lander, Ian Shapiro; my parents who have supported me in every way possible – and are at this moment watching over my daughter as I finish writing this dissertation; my brother and sister out-law who were always there when I needed advice or a reality check; and finally, I would like to thank my wife for reading the many early drafts of the papers making up this thesis, double-checking my math, and adding purpose to my life as I move forward...