

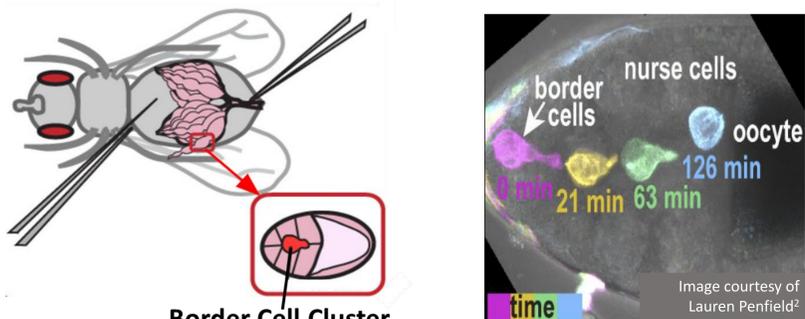


Rho1 and its effectors uniquely modulate border cell cluster texture and mechanics

Emily G. Gemmill¹; Joseph P. Campanale, PhD²; Allison M. Gabbert, PhD³; Noah P. Mitchell, PhD⁴; Kevin Chang⁵; Denise J. Montell, PhD^{1,2}

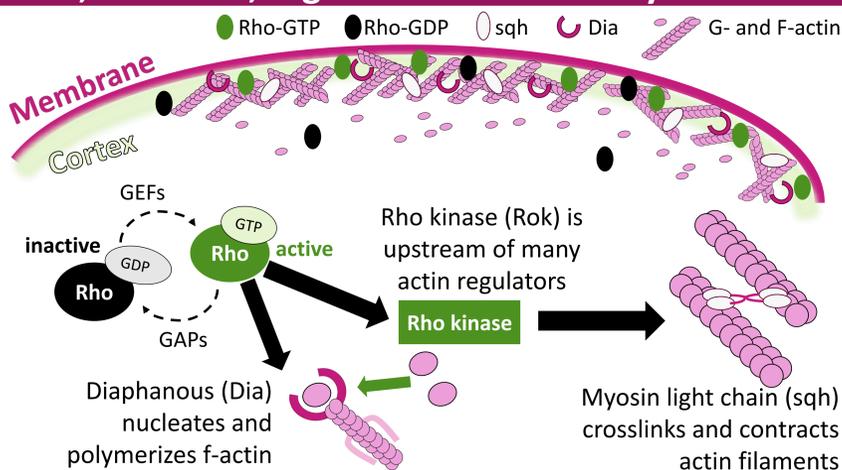
¹Interdisciplinary Program in Quantitative Biology, University of California, Santa Barbara; ²Molecular, Cellular, and Developmental Biology, University of California, Santa Barbara; ³Division of Cardiovascular Medicine and Division of Hemostasis and Thrombosis, Beth Israel Deaconess Medical Center and Harvard Medical School; ⁴Molecular Genetics and Cell Biology, University of Chicago; ⁵Department of Mathematics, University of California, Santa Barbara

Border cell clusters model collective migration



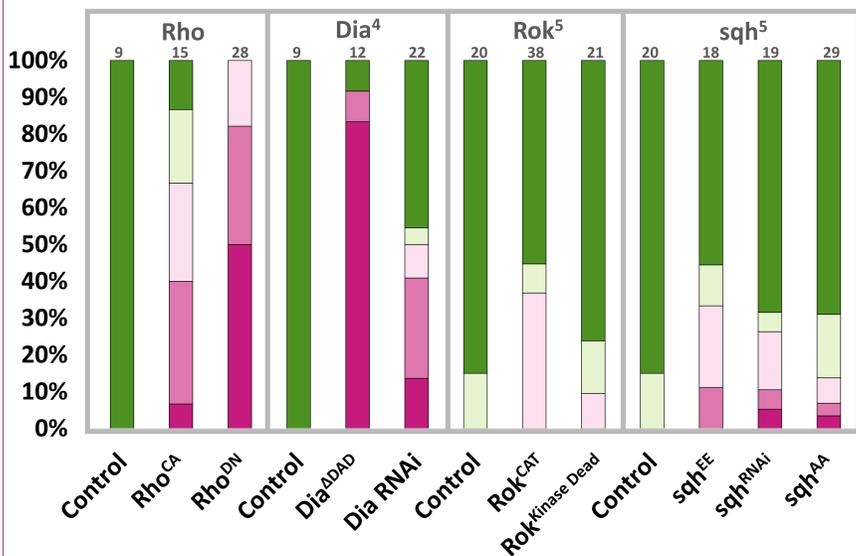
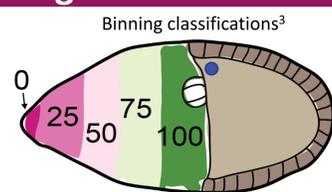
Border Cell Cluster
Border cell clusters are a group of 6-8 cells found in the *Drosophila* ovary¹ that provide an *in vivo* model for collective, confined migration

Rho1, a GTPase, regulates the cortical cytoskeleton

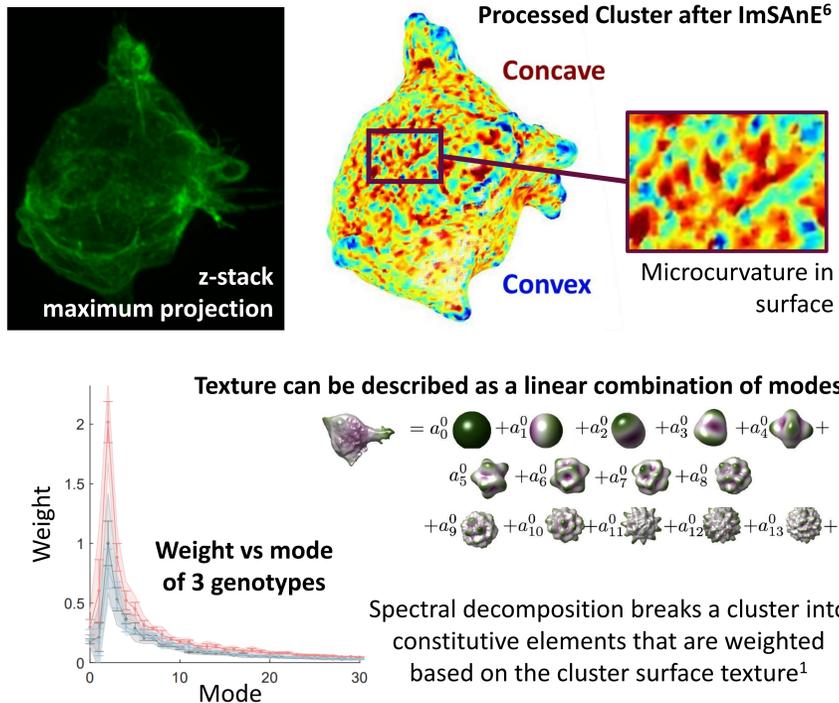


Rho and its effectors induce migration defects

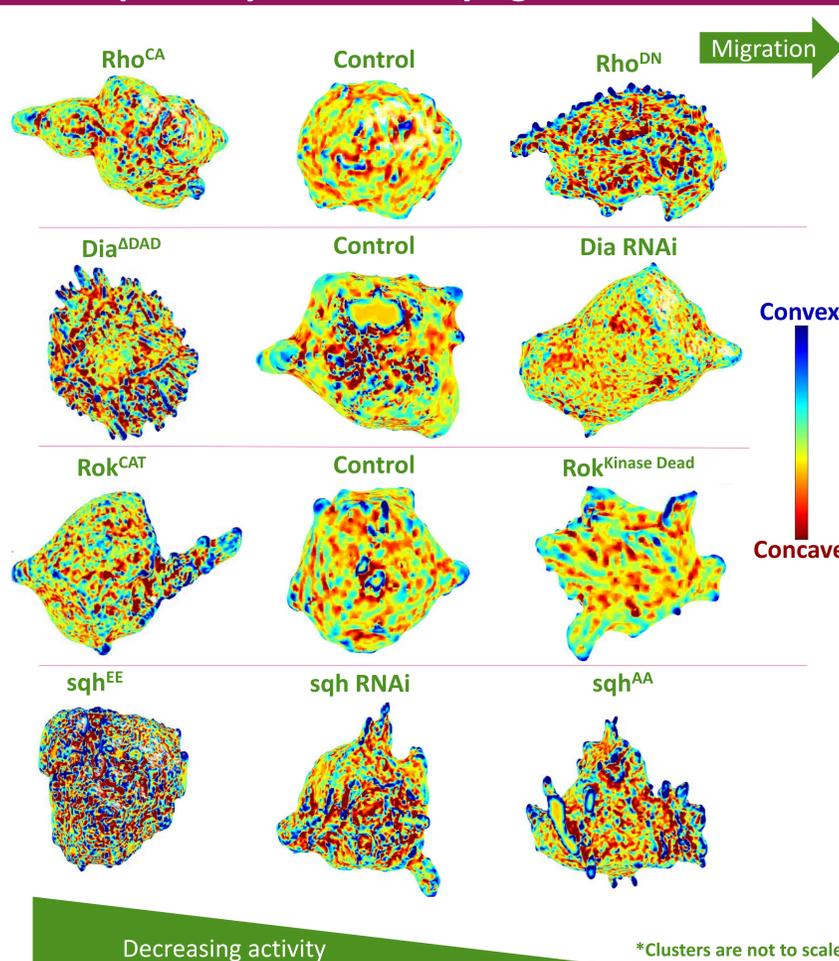
Border cell clusters adhere at the oocyte at stage 10. A cluster is considered to have a defect based on the percent of the migration path that it successfully travels by stage 10.



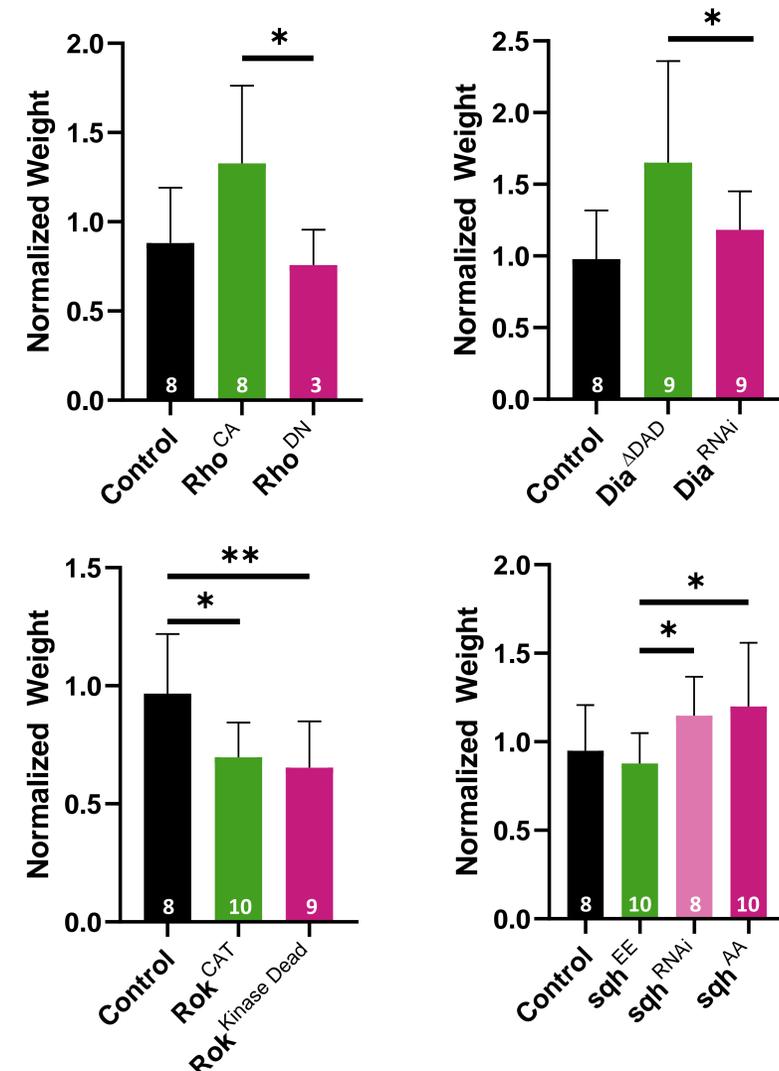
Spectral decomposition quantifies surface texture



Rho pathway induces varying surface textures



Modulating Rho and effector activity alters texture



Mean with standard deviation; *p < 0.05 and **p < 0.005 when analyzed using Brown-Forsythe and Welch ANOVA tests

Conclusions and future directions

- Rho and its effectors work together to regulate texture, all in unique ways, indicating phenotypic plasticity.
- Future work will seek to understand the molecular mechanism behind texture, as well as the network architecture of texture regulation.
- Upstream phenotypes may be recreated by adding downstream effectors, which will be the subject of future research.
- Additional Rho effectors are being tested to see if they modulate texture.

Acknowledgements

