

BE 159: Signal Transduction and Mechanics in Morphogenesis

Justin Bois

Caltech

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Questions to consider: Goehring, et al., “Polarization of PAR proteins by advective triggering of a pattern-forming system”

Following are some questions that it will be helpful to understand when reading the paper. They are definitely not exhaustive, but useful to help you understand the motivation of the work and the experimental protocols.

1. How can the results of the Mayer, et al. paper serve to inform this paper?
2. How are mechanics and biochemistry coupled in this system?
3. What is a Péclet number? What is its relevance in this paper?
4. The authors used the “feeding method” or RNAi. What is this?
5. What is a spinning disc confocal microscope?
6. Why are the authors so careful in their exploration of the k_{AP} and k_{PA} parameter space? What does this parameter space exploration tell us?
7. What is bistability in the context of the reaction system, and why is it so important?
8. What is meant by “limiting pools” or PAR proteins?
9. What is meant by “passive advection”?