



Intracellular Pattern Generation: Mechanics meets Biochemistry

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Abstract:

I will present recent advances in our understanding of the coupling of mechanical and biochemical processes for the purpose of forming intracellular patterns. I will discuss in general terms the mechanism of pattern formation in active fluids in which active stress is regulated by diffusing molecular components. I will then present a particular biological example, the polarization of the *C. elegans* zygote, a classic example for mechanochemical coupling. I illustrate how passive advection by actively generated fluid flow is sufficient to drive asymmetry in PAR proteins and thereby acts as a trigger for pattern formation. Our work suggests that passive advective transport in a regulated active material is a general mechanism by which patterns are established in developmental biology.

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