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Do Recurved Sensory Organs in Drosophila Form Through a Turing-Type Bifurcation? HUIFENG ZHU, Department of Physics University of Houston — We study the recurved bristles on *Drosophila* wing margin of wild-type and mutant.The expression levels of the *achaete-scute* complex protein determine the epidermal or neural fate of a pro-neural cell. In wide-type flies, the development ends in a state where a recurved bristle grows out nearly every fifth cell. Recent experiments have shown that the frequency of recurved bristles can be changed by adjusting the mean concentrations of the zinc-finger transcription factor *Senseless* and the micro_RNA miR-9a. With reduced levels of miR-9a, mutant flies grow regular organization of recurved bristles, but with a lower periodicity. We argue that the characteristics of bristle organization are signatures of a Turing-type bifurcation which emerges from a uniform background in reaction-diffusion process, in continua. In contract, fly wing margin consists of a discrete array of cells with possible cross-species interactions. Further, proteins do not diffuse between cells. We argue that the intracellular actions can play the role of diffusion in a discrete cell array. However, the analogs of diffusion coefficients can be positive or negative. Intracellular actions should give a conserved cell number periodicity. We introduce a simple model to study pattern formation in such cellular arrays based on intracellular actions. Also, we observe that periodicity both in length and cell numbers from different group of flies.

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