Quantitative Biology > Other Quantitative Biology

Fluctuation-driven Turing patterns

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Models of diffusion driven pattern formation that rely on the Turing mechanism are utilized in many areas of science. However, many such models suffer from the defect of requiring fine tuning of parameters or an unrealistic separation of scales in the diffusivities of the constituents of the system in order to predict the formation of spatial patterns. In the context of a very generic model of ecological pattern formation, we show that the inclusion of intrinsic noise in Turing models leads to the formation of "quasi-patterns" that form in generic regions of parameter space and are experimentally distinguishable from standard Turing patterns. The existence of quasi-patterns removes the need for unphysical fine tuning in the application of Turing models to real systems.

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