

Meeting: 998, Houston, Texas, SS 13A, Special Session on Continuous Distributed Parameters Models in Mathematical Biology.

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Pablo Padilla* (pablo@mym.iimas.unam.mx), IIMAS, UNAM, Circuito Escolar, Cd. Universitaria, 04510 Mexico City, Mexico, and **Elena Alvarez-Buylla** and **Carlos Espinosa**.
Genetic regulatory networks and pattern formation.

We present a dynamic network model that integrates the main genetic regulatory interactions that determine the cell fate during flower development in Arabidopsis. We recover the patterns of gene activation observed experimentally. Based on the previous discrete dynamical system we also derive a Fokker-Planck equation that enables to predict the correct temporal sequence of floral organ formation. Finally, we propose a reaction-diffusion model for the spatio-temporal dynamics of cell differentiation and pattern formation in Arabidopsis in which the reactive term is deduced from the genetic network. (Received March 01, 2004)