

## On Cycles in Nonlinear Dynamical Systems of Biochemical Kinetics

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S. Smale has formulated conditions of existence of cycles in phase portrait of one 4-dimensional dynamical system considered as a (very hypothetical) model of interaction of two biological cells. He has indicated that this dynamical system has no connections with any biological experiment.

We study phase portrait of a 6-dimensional nonlinear dynamical system considered as a model of an early stage of morphogenesis of *Drosophila melanogaster*.

Sufficient conditions of existence of an unstable cycle in the phase portrait of this system are described.

We describe other classes of nonlinear dynamical systems modeling some biological processes, and show existence, stability and non-uniqueness of cycles in their phase portraits.