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Mathematical analysis of a PDE model describing chemotactic *E. coli* colonies

Abstract

We consider an initial-boundary value problem describing the formation of colony patterns of bacteria Escherichia coli. This model consists of reaction-diffusion equations coupled with the Keller-Segel system from the chemotaxis theory in a bounded domain, supplemented with zero-flux boundary conditions and with nonnegative initial data. We answer questions about the global in time existence of solutions as well as on their large time behavior. Moreover, we show that the solutions of a related model may blow up in finite time. This is joint work with R. Celinski, G. Karch and M. Mimura.