

An advection-dominated model for chemotaxis

We study the classical model for chemotaxis, the so-called Keller-Segel model, which is a drift-diffusion equation for the cell density coupled with an elliptic equation describing the evolution of the chemoattractant. We consider the case of small diffusivity and investigate the limit as the diffusion coefficient goes to zero. Considering a model where the drift term vanishes at high cell densities leads to a nonlinear equation which allows the formation of shocks in the limit. Moreover, we look at the long term behaviour of solutions.