

A Kinetic Theory Approach to Resolving the Chemotactic Wave Paradox

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Abstract: We study kinetic models for amoebal chemotaxis, incorporating the ability of cells to assess temporal changes of the chemoattractant concentration as well as its spatial variations. After having chosen an appropriate scaling of time and space, we carry out a formal hyperbolic limit, constructing a diffusion term as a higher order correction. The resulting macroscopic equations are coupled with a simple model for production and propagation of the chemoattractant. To test our model, we perform numerical experiments.