

Chemotactic clustering with discontinuous advection

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Bacterial chemotaxis describes the ability of single-cell organisms to respond to chemical signals. In the case where the bacterial response to these chemical signals is sharp, the corresponding chemotaxis model for bacterial self-organization exhibits a discontinuous advection speed. This is a key challenge for analysis. We propose a new approach to circumvent the discontinuity issue following a perturbative approach, where the shape of the cellular profile is clearly separated from its global motion. As a result, we obtain exponential relaxation to equilibrium with an explicit rate. This is joint work with Vincent Calvez (Université Claude Bernard Lyon 1, France).

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