



## 复旦大学数学科学学院 数学综合报告会

报告题目: On a Signal-dependent Keller-Segel Model for Local Sensing Chemotaxis, Part I

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摘要: We would like to report our recent research on a signal-dependent Keller-Segel model in a series of talks. The model was originally proposed by Keller and Segel in their seminal work in 1971, which models the cellular movements due to a local sensing chemotaxis. The model features a signal-dependent motility which may vanish as the concentration becomes unbounded. Thus degeneracy is the main obstacle in analysis. In our work, we develop a new comparison method based on the nonlinear structure which provides us an explicit point-wise upper bound estimate for the concentration. Then, we study the global existence of classical solutions and discuss the boundedness. Moreover, a critical mass phenomenon as well as an infinite-time blow-up was verified in the two-dimensional setting. The talk is based on my recent joint work with K. Fujie from Tohoku University.

**Part I: introduction of the problem and the new comparison method.**

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