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**Some structures of the solution set for a stationary system of chemotaxis.** (English)

Zbl 0999.35031

[Adv. Math. Sci. Appl.](#) 10, No. 1, 191-224 (2000).

Summary: Some structures of the solution set for an elliptic boundary value problem describing the stationary state of the Keller-Segel system are presented. First, we control the blow-up of solutions. Then, some facts on existence and non-existence of the solution are proven. We also study the linearized stability. These theorems provide us with an expected bifurcation diagram for the disc region. This result is richer than that conjectured through numerical computation in the early 1980s, and explains the reason for the discrepancy between the conjecture on the non-stationary Keller-Segel system at that time and a recently proven theorem.

**MSC:**

[35J65](#) Nonlinear boundary value problems for linear elliptic equations

[47J30](#) Variational methods involving nonlinear operators

[35J20](#) Variational methods for second-order elliptic equations

Cited in **32** Documents

**Keywords:**

[Keller-Segel system](#); [blow-up of solutions](#); [existence](#); [stability](#)