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Model of chemotaxis and nonlinear diffusion

We study a parabolic-elliptic system of partial differential equations, which describes the chemotaxis in porous mediums.The general structure of the chemotaxis model in porous mediums is

$$\frac{\partial n}{\partial t} = \nabla \cdot (n^\sigma \nabla n) - \chi \nabla \cdot (n \nabla c), \sigma \geq 0,$$

$$\Delta c = -n, \tag{1}$$

where $n = n(x,t), c = c(x,t), x \in R^d, t \in R^+$.If $\sigma = 0$ we obtain Patlak-Keller-Segel chemotaxis model for the space and time evolution of the density $n = n(x,t)$ of cells and the chemical concentration $c = c(x,t)$ at time t and position $x \in \Omega \in R^d$

$$\frac{\partial n}{\partial t} = \Delta n - \chi \nabla \cdot (n \nabla c)$$

$$\Delta c = -n,$$

where χ is the chemotactic sensitivity of cells [1–3].
Consider stationary case of (1) we obtain the system of differential equations

$$\nabla \cdot (N^\sigma \nabla n) - \chi \nabla \cdot (N \nabla C) = 0, \sigma \geq 0,$$

$$\Delta C = -N. \tag{2}$$

In this report we suggest the scheme of finding of sufficiently conditions of localizations absence in system (1). The method of investigation based on theory of one-parametric nonlinear semigroups $\{T(t)(N,C)^*\}$, where N and C are solutions of system (2).

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