Self-similar solutions to some chemotaxis system with local sensing

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In this talk, we consider the chemotaxis system with local sensing:

$$\begin{cases} u_t = \Delta(e^{-v}u), \\ 0 = \Delta v + u. \end{cases}$$

This system was introduced to describe a chemotaxis movement taking account of the local sensing effect. It is known that this system resembles the well-known Keller–Segel system. Under suitable setting, they share the same set of equilibria and have the same Lyapunov functional. However, while finite-time blowup solutions can be constructed for the Keller–Segel system, in our system solutions exist globally in time independently of the magnitude of mass and we observe "delayed blowup": infinite-time blowup solutions. In this talk, we will construct some self-similar solutions and discuss their infinite-time blowing up behaviour. This talk is based on a joint work with Takasi Senba (Fukuoka University).

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