

# Online Seminar on Chemotaxis

Date: 19th of April 2024 17:00 – 18:00 in “Seoul–Tokyo” hour  
10:00 – 11:00 in “Central EU (summer time)” hour  
16:00 – 17:00 in “Beijing” hour

Speaker: Tatsuya Hosono (Tohoku University)

Title:

Global existence and boundedness of solutions to the 4D fully parabolic chemotaxis system with indirect signal production

Abstract:

This talk deals with the Cauchy problem for the 4-dimensional fully parabolic chemotaxis system with indirect signal production, and aims to discuss initial conditions for solutions to exist globally in time or to be bounded uniformly in time. To begin with, we present that solutions with initial mass below  $(8\pi)^2$  exist globally in time. The value  $(8\pi)^2$  is known as the 4-dimensional threshold value for the initial mass determining whether the blowup of solutions occurs or not. Nevertheless, the proof of global solutions on the whole space  $\mathbb{R}^4$  provides only time-dependent estimates unlike the one on a bounded domain, due to the unboundedness of  $\mathbb{R}^4$ . In order to establish time-independent estimates, we introduce a suitably designed energy functional, so that a condition on the initial mass ensuring the boundedness of solutions is discussed. This talk is based on a joint work with Philippe Laurençot (CNRS & Université Savoie Mont Blanc).

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Seminar website: <http://www.math.tohoku.ac.jp/~fujie/OSC.html>

Organizers: Jie Jiang (jiang@apm.ac.cn) and Kentaro Fujie (fujie@tohoku.ac.jp)