

ADVANCED LIFE SCIENCE SEMINAR

Speaker: **Dr. Yuki TSUKADA**

(Graduate School of Science, Nagoya University)

Quantitative approaches to bridge live imaging data and mathematical model -In the case of behavioral neuroscience using *C. elegans*-

ライブイメージングデータと数理モデルをつなぐ定量的アプローチ
-線虫を用いた行動神経科学を例に-

Date: June 5, 2019 17:00-18:00

Venue: Shionogi Innovation Center for Drug Discovery, 1st floor,
Community Hall (N21 W11, Hokkaido Univ.)

北キャンパス・シオノギ創薬イノベーションセンター
(創薬基盤技術研究棟) 1F 産学コミュニティホール

Abstract:

To understand dynamic phenomena in biological processes, both live imaging and mathematical models are powerful and necessary. However, the integration of experimental data and theoretical results is often not easy. I will introduce our quantitative approaches to combine experimental and theoretical methods using image analysis, mathematical modeling, and microscope regulation. Applications of our approaches to the compact neural circuit of thermotaxis in *C. elegans* illustrate how we can understand the mechanisms of information processing in a nervous system. Based on the simultaneously monitored neural activity and behavior, we identified a response function of a main thermosensory neuron AFD and constructed a mathematical model. Then our model depicts how small animals recognize environmental thermal field for their navigation. Thus, our results provide systems neuroscience view of behavioral regulation. I will also share the results of our on-going project about compartmental synaptic perturbation methods at a single synaptic level to extend our approaches.



Graduate School of Life Science

International Graduate Program (IGP)

Contact : Ryota UEHARA, or Takahiro YAMAMOTO (ext. 9238)

ruehara@sci.hokudai.ac.jp