Q-AOS 九州大学 アジア・オセアニア研究教育機構 ブラウンバッグセミナー

Brown Bag Seminar No. 260

2026 12.23 (wed.) 12:10 ~ 12:50

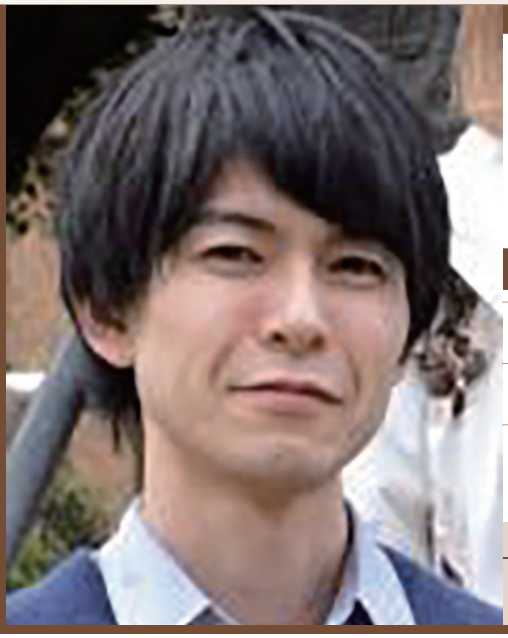
12:10-12:15 ◆ Introduction
12:15-12:40 ◆ Seminar (Presentation)
12:40-12:50 ◆ Q&A

Online (Zoom)
Scan here for Registration

https://us02web.zoom.us/webinar/register/WN_35kQDyckQU2mXq_jFQ8tqw

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High-Speed Spectroscopy for Large-Scale Single-Cell Analysis and Sorting



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
13 CLIMATE ACTION
14 LIFE BELOW WATER

Keywords

Raman spectroscopy
Raman flow cytometry
Single-cell analysis
Metabolic dynamics
Cell sorting

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Kotaro Hiramatsu is Professor in the Department of Chemistry, Faculty of Science, Kyushu University (since May 2025). Born in Hitachinaka, Ibaraki, he received his Ph.D. in Science from the University of Tokyo in March 2016. He was a visiting researcher at the University of Southampton (October 2014–March 2015), a Special Postdoctoral Researcher at RIKEN (April–August 2016), and an Assistant Professor at the University of Tokyo's Research Center for Spectrochemistry (2016–2023). He joined Kyushu University as Associate Professor in October 2023.

His research focuses on developing high-speed molecular spectroscopy and applying it to large-scale single-cell analysis and sorting. He also develops measurement methods that integrate optical sensing with information processing. He was a JST PRESTO researcher from 2018 to 2022 and has conducted research under the JST FOREST program since 2022. Since 2025, he has led the "Photonic Science of Smart Nanoparticles" research area under the Grant-in-Aid for Transformative Research Areas (B) program, advancing bioimaging research using low-energy light. His honors include the Spectroscopical Society of Japan Award for Young Scientists (2024), selection as a NISTEP Nice Step Researcher (2024), and the Young Scientists' Award from the Minister of Education, Culture, Sports, Science and Technology (2025).

Even cells of the same type can differ in what they produce and how they function. This talk introduces a way to use light to read the molecular "fingerprints" inside cells and examine large numbers of cells quickly. Raman spectroscopy allows us to study cells without staining them with dyes. Examples show how individual algal cells differ in their production of the red pigment astaxanthin and how we can track the uptake of carbon and its use to make molecules. We also introduce a technique for selecting cells based on the substances they contain, and discuss how it could help identify useful cells for producing food, fuels, and other products.

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