Immunology Seminar

Regulation and breakdown of pulmonary immune system through host-microbe interactions

~ 3D understanding of its interactions and immune regulation~

Assistant Professor Hiroshi Ichise

Dept. Immunology and Cell Biology, Graduate School of Medicie,
The University of Osaka

Date: January 16th (Fri), 2026 Time: 16:00–17:20 (Talk; ~1h, Q&A;~ 20min)
Venue: Seminar Room 134, 1st floor, No.1 Bldg., LiMe Inst. (Bldg. 31) (医生研1号館(構内マップ31番;134室) 1F 会議室)
The seminar will be held on site only

The functions of tissues that make up the human body are maintained through finely tuned interactions among diverse components, including epithelial cells, endothelial cells, immune cells, nerves, the extracellular matrix (ECM), and microbes. Disruption of these interactions can lead to a wide range of diseases. Among all organs, the lung is particularly vulnerable to invasion by pathogens such as bacteria and viruses and therefore serves as the front line of immune defense, involving epithelial cells and numerous immune cell populations. It is also widely recognized—most notably during the COVID-19 pandemic—that the severity of inflammation in lung tissue is the most critical determinant of lethality. However, the immunological mechanisms underlying these processes remain largely unresolved, and how immune responses in lung lead to lethal tissue damage during infection is still poorly understood.

In this seminar, I will discuss a broad range of topics, together with unpublished data, focusing on epithelial injury caused by excessive immune responses and subsequent tissue repair in an influenza infection model (Science, 2025). Furthermore, I will present the development of a novel technology that enables highly multiplexed three-dimensional imaging, allowing visualization of commensal–neuro–immune three-way interactions throughout the entire lung tissue.

(Selected publications)

1. **Ichise, H**, Speranza, E., La Russa, F., Veres, T.V., Chu, C.J., Gola, A., Germain, R.N., Rebalancing Viral and Immune Damage versus Repair Prevents Death from Lethal Influenza Infection. ***Science***,390 (6775): adr4635 (2025).
2. Zhang, W., Emanuel, E.R., Yano, H., Uddin, J., Gaudino, S., Zili Xie, Z., **Ichise, H.**, et al. A neuronal-epithelial circuit promotes sensory convergence and intestinal immunity. ***Nature***, in press
3. **Ichise, H**., Tsukamoto, S., Hirashima, T., Konishi, Y., Oki, C., Tsukiji, S., Iwano, S., Miyawaki, A., Sumiyama, K., Terai, K., Matsuda, M., Functional visualization of NK Cell-mediated killing of metastatic single tumor cells. ***eLife***, 11:e76269 (2022)
4. Konishi, Y., **Ichise, H**., …. . Matsuda, M. Intravital imaging identifies the VEGF-TXA2 axis as a critical promoter of PGE2 secretion from tumor cells and immune evasion. ***Cancer Research***, 81(15):4124–32 (2021)
5. **Ichise, H**., ….. Kawamoto, H., NK cell alloreactivity against KIR ligand-mismatched HLA-haploidentical tissue derived from HLA haplotype-homozygous iPS cells. ***Stem Cell Reports***,9 (3):853–867 (2017)

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Kyoto University Graduate Program for Medical Innovation

LiMe Institute for Life and Medical Sciences Kyoto University

Contact: Masaki Miyazaki, Dept. Immunology
Institute for Life and Medical Sciences,
Kyoto University
E-mail: mmiyazaki@infront.Kyoto-u.ac.jp