



## Atsushi KAWAGUCHI

Faculty of Medicine

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### Theme

● Molecular Virology

**Keyword** Emerging infectious diseases, Avian influenza, SARS-CoV-2, Antiviral drugs

### Highlight

#### Major Scientific Interests of the Group

The research aim of this group is to understand the molecular mechanism of replication and pathogenicity of animal viruses such as influenza virus and SARS-CoV-2. The structure and function of virus-encoded factors and host cell-derived factors involved in virus replication are being studied at the atomic, molecular and body levels. We also focus on the host innate immune responses against virus infection.

#### Projects for Regular Students in Doctoral or Master's Programs

- 1) Identification and characterization of novel factors in virus replication
- 2) Molecular mechanism of host innate immune

responses to virus infection

- 3) Control of virus infections through development of novel anti-viral drugs

#### Study Programs for Short Stay Students (one week – one trimester)

- 1) Molecular mechanism of host factors involved in influenza virus replication
- 2) Action mechanism of anti-virus drugs

#### Other Faculty Member

Assistant Professor Kohsuke KATO

Assistant Professor Takeshi SEKIYA

Assistant Professor Yuji Funakoshi

### Applications and Prospects

- Our projects focus on the molecular mechanism of replication and pathogenicity of emerging infectious diseases. Our findings will contribute the developments of antivirals and new diagnosis system. We also aim to establish animal models to understand the pathogenicity of emerging viruses.

### Literature, intellectual property, work

- 1) Lee S, Ishitsuka A, Noguchi M, Hirohama M, Fujiyasu Y, Petric PP, Schwemmler M, Staeheli P, Nagata K, Kawaguchi A. Influenza restriction factor MxA functions as inflammasome sensor in the respiratory epithelium. *Science Immunol.*, 2019; 4(40): eaau4643.
- 2) Lee S, Hirohama M, Noguchi M, Nagata K, Kawaguchi A. Influenza A virus infection triggers pyroptosis and apoptosis of respiratory epithelial cells through the type I interferon signaling pathway in a mutually exclusive manner. *J. Virol.*, 2018; 92(14): e00396-18.
- 3) Kawaguchi A, Hirohama M, Harada Y, Osari S, Nagata K. Influenza virus induces cholesterol-enriched endocytic recycling compartments for budzone formation via cell cycle-independent centrosome maturation. *PLoS Pathog.*, 2015; 11(11): e1005284.