



# Airborne Microbial Communities: Monitoring and Health Perspectives

## Abstract



Bioaerosols, or biological aerosols, play important roles in ecosystems, climate change, air quality, and public health. Understanding their sources, spatial and temporal distribution, environmental drivers, and associated health risks is therefore essential. These airborne biological particles—including bacteria, fungi, viruses, pollen, and algae—are ubiquitous in the atmosphere and range in size from 0.01 to 100 μm. Their sources are diverse, originating from water bodies, soil, dust events, plant leaf surfaces, animal feces, human activities, wastewater treatment plants, and agricultural activities.

In this presentation, I will introduce some recent and ongoing research projects, primarily conducted in Toyama, that aim to elucidate the spatiotemporal dynamics of atmospheric microbial communities and their potential health impacts. Our approaches include amplicon sequencing to characterize community structure, quantitative real-time PCR to measure microbial abundance, and culture-based and genomic analyses to investigate specific taxa. We also collected size-segregated air samples and analyzed their chemical composition. These efforts are uncovering relationships between microbial community composition, particle size distribution, regional differences, health effects, and atmospheric particle chemistry.

Given the limited current knowledge and growing interest in bioaerosols, I look forward to discussing and exchanging ideas on these emerging topics. As we confront global challenges such as climate change and emerging infectious diseases, a deeper understanding of the atmosphere’s role in microbial ecology and dispersal is becoming increasingly important.

Date

Online



2026  
**2/20**  
Friday  
17:00 ▶ 18:00

<https://00m.in/CqYXE>



JOIN  
NOW

Language: Japanese

Venue

Hiroshima University, Graduate School of Advanced Science of Matter Build A, 6F Seminar room601-(2)



Presenter

**Dr. Daisuke Tanaka**

Professor  
University of Toyama



TSE Program  
Hiroshima University



Contact

Fumito Maruyama, Ph.D.

E-mail: [fumito@hiroshima-u.ac.jp](mailto:fumito@hiroshima-u.ac.jp)

HP: <https://mge.hiroshima-u.ac.jp/en/>