

# Study on fate of waterborne pathogens for the safe drinking water supply

Takayuki MIURA

To ensure the microbiological safety of drinking water supplies even in flooding or water shortage which may become larger or more frequent with climate change, behaviors of viruses, bacteria, and protozoa in sources and treatment processes are investigated, and risk management strategies are developed based on the quantitative microbial risk assessment.

## Behavior of waterborne pathogens in water environments

Occurrence and level of viruses, bacteria, protozoa, genetic and chemical markers in raw water (river, lake, reservoir, groundwater) and treatment processes

## Quantitative microbial risk assessment (QMRA)

- Estimation of the infection risk associated with drinking water consumption
- Calculation of the removal and inactivation efficiencies required for treatment processes

## Development of risk management strategies

Proposal of targets, indicators, water quality parameters, and operational conditions for drinking water treatment processes based on the data obtained through the nationwide surveys and QMRA.

## Devices and techniques used in analyses or experiments

- Real-time PCR, LC-MS/MS
- Next-generation sequencing
- Immunoassays (e.g., ELISA, immunostaining)
- Electron microscope

