JIHS
Japan Institute for Health Security

Reporter Phages for Rapid and Specific Bacterial Detection

■ Research Team

- Researcher: Kotaro Kiga
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- Team members: Azumi Tamura et al.
- Target organisms: *E. coli* O157, carbapenem-resistant *E. coli*, and *S. aureus*; potential expansion to other pathogens is under evaluation
- IP status: Patent application filed

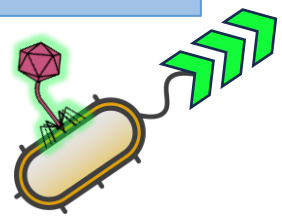
■ Research Concept & Technology

- **Technology platform: Genetically engineered reporter phages**
- A reporter gene is engineered into a phage that specifically infects the target bacterium; infection of viable target cells generates a detectable signal
- Proprietary phages and reporter systems provide both high specificity and ease of use in an in vitro diagnostic format
- The assay is designed for integration into existing culture and antimicrobial susceptibility testing workflows

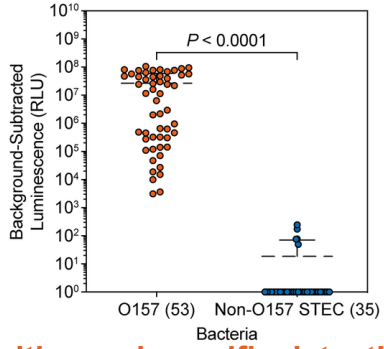
■ Background & Unmet Need

- Early identification of EHEC, CRE, and MRSA supports timely clinical and infection-control decisions
- Simple, rapid detection of target bacteria is needed alongside conventional testing
- The goal is to establish a broadly applicable detection platform for drug-resistant and foodborne bacterial pathogens

■ Project Overview



Rapid detection of bacterial pathogens using reporter phages
Reporter phage infection produces a luminescent signal
Tamura A et al. Commun Biol. 2024;7:535.



Sensitive and specific detection of *E. coli* O157 using a reporter phage

■ Development Plan

- Validate the assay using clinical specimens and bacterial isolates
- Explore development of an in vitro diagnostic (IVD) kit **(Seeking co-development partners)**