RESEARCH REPORT - No. 1504 FY 2015–2016

Title of research project	Space-time genomic comparative analyses about circulation of antimicrobial resistant bacteria between livestock and human
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Name of principal research Investigator（PI）	Yoshichika Arakawa

【Abstract】

To elucidate the mode of transmission of antimicrobial resistance genes between livestock and human, we performed a space-time genomic comparative analyses using more than 100 plasmidic genome data we newly obtained in this study, together with the genome data deposited in the open genome databases.

It was suggested that IncI1 plasmid carrying *bla* CTX-M-8 gene first originated in chicken and transmitted to human through retail chicken meat. Mcr-1,plasmid-mediated colistin resistance gene located IncI2 plasmid, detected in *Escherichia coli* recovered from a domestic chicken meat sample purchased in Nagano Prefecture in Japan in 2016 may have first emerged outside of Japan many years before it was introduced to Japan, but the plasmid gradually changed in its genomic structure after its introduction, suggesting the spread in this country.

Since the genomic structure of plasmids mediating various antimicrobial resistance genes have become very divergent and complicated, we need to develop new algorisms for more effective genetic analyses on the relatedness of the antimicrobial resistance genes and plasmids recovered in *E. coli* isolates from livestock and human. In conclusion, we succeeded in making clear the genetic relatedness of IncI1 plasmid carrying *bla* CTX-M-8 gene that initially originated in chicken in southern America and is considered to be spreading globally via chicken meat.