Supplementary material

Table S1 The characteristics of collection methods

Collection methods	Advantage	Disadvantage	Corresponding sampler	References
Solid impact sampling	Suitable for high concentration sampling	Not suitable for low temperature or long time	Six-stage Andersen sampler	Chen, 2018
Liquid capture sampling	Reduce microbial damage	Only for short-term collection of samples	AGI-30 sampler	Wang, 2002
Centrifugal sampling	Simple structure; Small size; Low noise	The gas production is not constant	RCS centrifugal air microbial sampler	Xue et al., 2007
Cyclonic sampling	Continuous or long-term sampling	Reentrainment problems	Two-stage micro cyclone sampling device	Du, 2006
Electrostatic sampling	Reduce the impact on microorganisms	Low microbial survival efficiency	EAS aerosol electrostatic sampling device	Han et al., 2008
Filter sampling	High capture efficiency; Easy operation	Easy block for membrane aperture	Portable large flow air sampler	Li, 2003

Chen P (2018). Design and application of microbial aerosol sampler. Zhejiang University

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Table S2 The characteristics of airborne resistance genes determination methods

Methods	Fundamentals	Characteristics	References
qPCR	Primer amplification; quantify by standard curve	High sensitivity, good accuracy, safe and fast process	Xue et al., 2017
High-throughput qPCR	Specific primer amplification; quantify by standard curve	Hundreds of genes are detected at the same time; Massive data analysis	Yu et al., 2018
Droplet digita PCR (ddPCR)	Direct counting	Slightly higher accuracy; High price	Jiang et al., 2016
Southern blot	Isotope labeling	Fast and accurate; Cumbersome operation procedures	Jin et al., 2017
High-throughput sequencing	The number of sequencing indicates the abundance of genes.	Large processing capacity; Reliance on the integrity of existing databases	He et al., 2014

He X M (2014). Studies on airborne microorganism pollution detection method and application in a wastewater treatment plant. Harbin Institute of Technology

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Xue Y G, Liu F, Wang L P, Jiang X D, Wang Q, Shi X L, Jin S, Jiang Y (2017). Progress in research on antibiotic resistance genes in aerosols: take farms and hospitals as examples. Asian Journal of Ecotoxicology, 12: 27–37

Yu T, Xie Y, Chen X Q, Chen X Q, Li K K, Wei L H (2018). Advances in application of high-throughput sequencing in pathogenic microbial resistance. Chinese Journal of Microecology, 30: 739–744

Table S3 Nutritional broth medium formula

Substance	Concentration (g/L)
Peptone	10
Beef powder	3
NaCl	5

Operation: Prepared in ultrapure water and autoclaved at 121 ℃ for 30 min

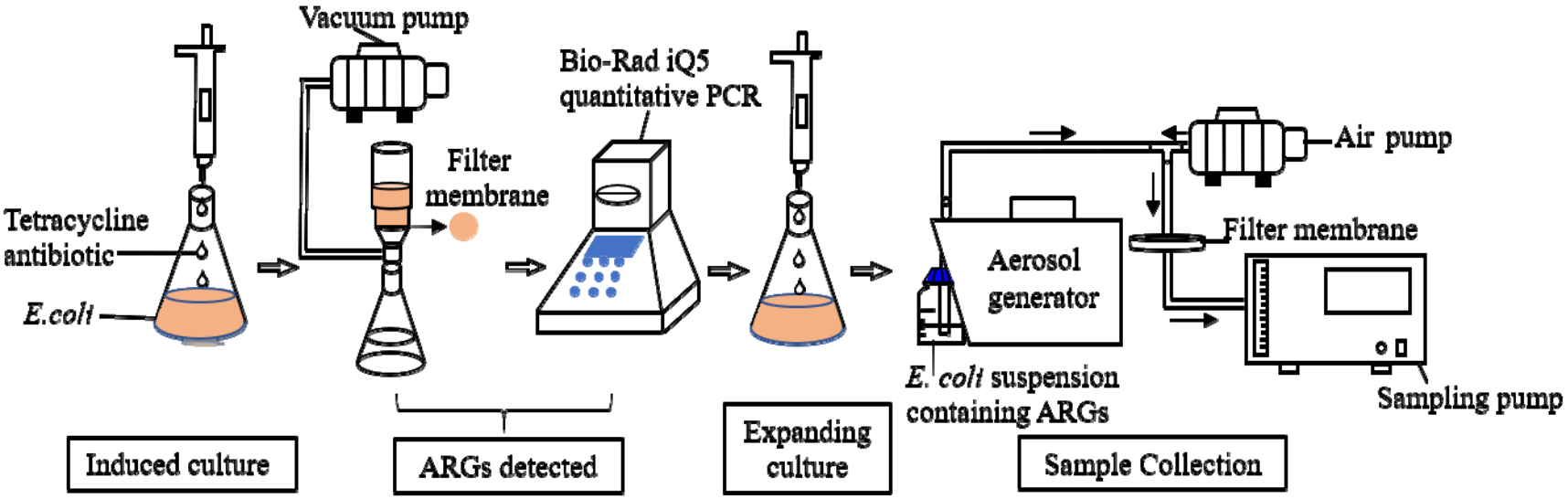

Fig. S1 Generation of airborne *Escherichia coli* containing tetracycline resistance gene