

Table S1. Summarization of environmental monitoring background data with bacterial load and MRSA prevalence in collected bioaerosol and stool samples.

	Samples No (n)	Concentration detection of odor pollutants				Wind direction		MRSA detection rate (%)		Total bacteria count in air (CFU/m ³)
		Ammonia	Methylamine	Hydrogen sulfide	Mercaptan	Summer	Winter	Bioaerosol	Stool	
Chicken shed 1	3	2-7ppm	5-7ppm	N/D	N/D	south-east	north-west	3/3 (100%)	3/3 (100%)	1.53×10 ³ to 2.63×10 ³
Chicken shed 2	3	2-7ppm	5ppm	N/D	N/D	south-east	north-west, north	3/3 (100%)	3/3 (100%)	1.53×10 ³ to 2.65×10 ³
Exposure plaza	3	3ppm	2.5ppm	N/D	N/D	south-east	north-west, west	3/3 (100%)	3/3 (100%)	7.67×10 ² to 3.04×10 ²

N/D = below detection limit (detection limit for hydrogen sulfide and mercaptan is < 0.05 ppm and < 0.1 ppm)

Table S2. The PCR detecting conditions for strain identification, *Spa* typing, *SCCmec* typing, and enterotoxin characteristics

Target gene	Size	Sequence (5' to 3')	Reaction Materials Final Volume: 25 µl	PCR Condition	Reference
<i>nuc</i> <i>mecA</i>	270 448	nuc-F 5'-GCGATTGATGGTGATACGGTT-3' nuc-R 5'-AGCCAAGCCTTGACGAACTAAAGC-3' mecA-F 5'-CTCAGGTACTGCTATCCACC-3' mecA-R 5'-CACTTGGTATATCTTCACC-3'	DNA: 100-300 ng Primer: 400 nM nuc FR & mecA FR Master mix: 5 µl	Pre-denaturation: 95°C 5 min Denaturation: 94°C 60s Annealing: 55°C 60s Extension: 72°C 60s D.A.E. Cycles: 30 cycles Final extension: 72°C 10 min	[1,2]
<i>Spa</i>	270	<i>Spa</i> -1113F: 5'-TAAAGACGATCCTTCGGTGAGC -3' <i>Spa</i> -1514R: 5'-CAGCAGTAGTGCCGTTTGCTT -3'	DNA: 100-300 ng Primer: 200 nM <i>Spa</i> FR Master mix: 5 µl	Pre-denaturation: 80°C 5 min Denaturation: 94°C 45s Annealing: 60°C 45s Extension: 72°C 90s D.A.E. Cycles: 35 cycles Final extension: 72°C 10 min	https://spaserver.ridom.de/
SCCmec I SCCmec II SCCmec II, III SCCmec III SCCmec III SCCmec I, II, IV	495 284 209 243 414 342	CIF2 F2: 5'-TTCGAGTTGCTGATGAAGAAGG-3' CIF2 R2: 5'-ATTTACCACAAGGACTACCAGC-3' KDP F1: 5'-AATCATCTGCCATTGGTGATGC-3' KDP R1: 5'-CGAATGAAGTGAAGAAAAGTGG-3' MECI P2: 5'-ATCAAGACTTGCATTAGGC-3' MECI P3: 5'-GCGGTTTCAATTCATTGTC-3' RIF F3: 5'-GTGATTGTTTCGAGATATGTGG-3' RIF R9: 5'-CGCTTATCTGTATCTATCGC-3' RIF F10: 5'-TTCTTAAGTACACGCTGAATCG-3' RIF R13: 5'-GTCACAGTAATTCCATCAATGC-3' DCS F2: 5'-CATCCTATGATAGCTTGGTC-3' DCS R1: 5'-CTAAATCATAGCCATGACCG-3'	DNA: 100-300 ng Primer: 400 nM CIF-FR, 200 nM KDP-FR, 200 nM RIFF3R9 400 nM MECI-FR, 400 nM RIFF10R13, 800 nM DCS-FR Master mix: 5 µl	Pre-denaturation: 94°C 4 min Denaturation: 94°C 30s Annealing: 53°C 30s Extension: 72°C 1 min D.A.E. Cycles: 30 cycles Final extension: 72°C 4 min	[3]
SCCmec V	325	Type V-F: 5'-GAACATTGTTACTTAAATGAGCG-3' Type V-R: 5'-TGAAAGTTGTACCCCTTGACACC-3'	DNA: 100-300 ng Primer: 100 nM V-FR Master mix: 5 µl	Pre-denaturation: 94°C 5 min Denaturation-1: 94°C 45s Annealing-1: 65°C 45s Extension-1: 72°C 1.5 min D.A.E.-1 Cycles: 10 cycles Denaturation-2: 94°C 45s Annealing-2: 55°C 45s Extension-2: 72°C 1.5 min D.A.E.-2 Cycles: 25 cycles Final extension: 72°C 10 min	[4]
SCCmec VI	134	ccrB4-F: 5'-CGAAGTATAGACACTGGAGCGATA-3' ccrB4-R: 5'-GCGACTCTCTTGGCGTTTA-3'	DNA: 100-300 ng Primer: 100 nM FR, Master mix: 5 µl	Pre-denaturation: 95°C 10 min Denaturation: 95°C 30s Annealing: 50°C 30s Extension: 72°C 30s D.A.E. Cycles: 40 cycles Final extension: 72°C 5 min	[5]
SCCmec VII SCCmec VIII	473 138	Type VII F: 5'-GTGACGTTGATATTGCAGTGGT-3' Type VII R: 5'-TGAAGAAGTTTGTTCGCGT-3' Type VIII F: 5'- AGCGACGATGAACAACACCGCTACTTACTCAA-3' Type VIII R: 5'-TTGGTTGAGAATGAGAACAGTGGTAAGATC- 3'	DNA: 100-300 ng Primer: 400 nM FR Master mix: 5 µl	Pre-denaturation: 95°C 2 min Denaturation: 95°C 30s Annealing: 54°C 1 min Extension: 72°C 1 min 20s D.A.E. Cycles: 35 cycles Final extension: 72°C 7 min	[6]
PVL	433	PVL-1: 5'-ATCATTAGGTAAAATGTCTGGACATGATCCA-3' PVL-2: 5'-GCATCAAGTGATTGGATAGCAAAAAGC-3'	DNA: 100-300 ng Primer: 400 nM FR Master mix: 5 µl	Pre-denaturation: 94°C 5 min Denaturation: 94°C 40s Annealing: 53°C 40s Extension: 72°C 1 min D.A.E. Cycles: 35 cycles Final extension: 72°C 10 min	[7]

	entA-F: 5'-TTGGAACGGTTAAAAACGAA-3'		
	entA-R: 5'-GAACCTTCCCATCAAAAACA-3'		Pre-denaturation: 94°C 5 min
	entB-F: 5'-TCGCATCAAACGACAAACG-3'		Denaturation: 94°C 1 min
	entB-R: 5'-GCAGGTACTCTATAAGTGCC-3'		Annealing: 2 min
entA	121 entC-F: 5'-GGAGGAATAACAAAACATGAAGG-3'		Extension: 72°C 1 min
entB	478 entC-R: 5'-AAAGGCAAGCACCAGGATAC-3'		D.A.E. Cycles: 35 cycles
entC	459 entD-F: 5'-TGGTGGTGAAATAGATAGGAC-3'	DNA: 100-300 ng	Final extension: 72°C 5 min
entD	384 entD-R: 5'-TGAAGGTGCTCTGTGGATAAT-3'	Primer: 400 nM	Annealing Temp.
entE	495 entE-F: 5'-TGGTAGCGAGAAAAGCGAAG-3'	Primer FR	entA: 50°C
tsst-1	271 entE-R: 5'-TGTAATAATGCCTTGCTGAA-3'	Master mix: 5 µl	entB: 55°C
eta	464 tsst-1-F: 5'-CTGGTATAGTAGTGGGCTG-3'		entC: 59°C
etb	200 tsst-1-R: 5'-AGGTAGTTCTATTGGAGTAGG-3'		entD: 51°C
	eta-F: 5'-TTTGCTTTCTTGATTGGATTTC-3'		entE: 55.5°C
	eta-R: 5'-GATGTGTTCCGTTTGATTGAC-3'		tsst-1: 54°C
	etb-F: 5'-ACGGCTATATACATTCAATT-3'		eta: 54°C
	etb-R: 5'-TCCATCGATAATATACCTAA-3'		etb: 50.9°C

[8]

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