**Table S1. Primers used in this study**

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| **Primers** | **Sequence 5'-3'** | **Application** |
| *SAUSA300*\_*0192*\_Fw | CCGGAATTCGGCTTTTCAGTGTATTTAGG | deletion of *SAUSA300*\_*0193* (*murQ*) gene in *S. aureus* |
| *SAUSA300*\_*0192*\_Rev | GCCGAGCTCGGTCGTACTATTTTCCATCAC | deletion of *SAUSA300*\_*0193* (*murQ*) gene in *S. aureus* |
| *SAUSA300*\_*0194*\_Fw | CCGAGATCTGTTAAACGAGCAATCAGAG | deletion of *SAUSA300*\_*0193* (*murQ*) gene in *S. aureus* |
| *SAUSA300*\_*0194*\_Rev | GCCGATATCCTAATGCGGCACCTACTTG | deletion of *SAUSA300*\_*0193* (*murQ*) gene in *S. aureus* |
| *SAUSA300*\_*0193*\_test\_Fw | GTTATTGTAATAATCCAGCAGTAG | verification of *SAUSA300*\_*0193* (*murQ*) gene deletion in *S. aureus* |
| *SAUSA300*\_*0193*\_test\_Rev | CACCCAACAAATCTGTCTGTCG | verification of *SAUSA300*\_*0193* gene (*murQ*) deletion in *S. aureus* |
| pRB474\_*0193*\_Fw | GAGAAGCTTGAGCCGAATGATACATTTG | cloning of *SAUSA300\_0193* (*murQ*) in pRB474 in *S. aureus* |
| pRB474\_*0193*\_Rev | GGCGAATTCCCTCCTAAGGTTGTCTATCTC | cloning of *SAUSA300\_0193* (*murQ*) in pRB474 in *S. aureus* |
| pRB474\_*0193*\_test\_Fw | GTCTTTCGACTGAGCCTTTC | sequencing of pRB474-*murQ* in *S. aureus* |
| pRB474\_*0193*\_test\_Rev | GCTAGAGCGGCGGATTTGTC | sequencing of pRB474-*murQ* in *S. aureus* |
| *SAV0190*-up-Fw | ATAATGAATTCATAATAGGTACGAAACGCTTAC | deletion of *SAUSA300\_0192* to *SAUSA300\_0195* genes |
| *SAV0190*-up-Rev | AATTAGAGCTCTAATCAGTTAAAGCCTGTTCATTG | deletion of *SAUSA300\_0192* to *SAUSA300\_0195* genes |
| *SAV0190*-do-Fw | AATATGTCGACCTTGATAATTACCGGAAGCATC | deletion of *SAUSA300\_0192* to *SAUSA300\_0195* genes |
| *SAV0190*-do-Rev | TATAAGATATCGTGTAATTTTGTTTGCGGTAACG | deletion of *SAUSA300\_0192* to *SAUSA300\_0195* genes |
| pJM103*ybbI*1\_Fw | GCCCGGGTGCTTCCCGCTTTTGAGC | deletion of *ybbI (murQ)* gene in *B. subtilis* |
| pJM103*ybbI*1\_Rev | GCGGGATCCCATGAGGATGCCCCCTGTT | deletion of *ybbI* (*murQ*) gene in *B. subtilis* |
| pJM103*ybbI*2\_Fw | GCGGGATCCTGATAAGGAGAGAACTAG | deletion of *ybbI* (*murQ*) gene in *B. subtilis* |
| pJM103*ybbI*2\_Rev | GAAGCTTTCCTGAATGGCTTGAATGG | deletion of *ybbI* (*murQ*) gene in *B. subtilis* |
| A\_Fw\_Cluster1 | GCCTGAACACTTGCCCGAGCTCCAATCA | verification of *ybbI* (*murQ*) gene deletion in *B. subtilis* |
| C\_Rev\_Cluster1 | CGTCACTTGAATTGGCTAAGGCGC | verification of *ybbI* (*murQ*) gene deletion in *B. subtilis* |
| pJMOp-XmaI-Fw | AGCTGCCCGGGTTCCGGCGTGTAAAAGTAAA | deletion of *murQRP* operon in *B. subtilis* |
| pJMOp-BamHI-Rev | CAGCTGGATCCGTGAAAACAAAGACACTGTT | deletion of *murQRP* operon in *B. subtilis* |
| pJMOp-BamHI-Fw | AGCTTGGATCCGAGGATGCCCCCTGTTTTAA | deletion of *murQRP* operon in *B. subtilis* |
| pJMOp-HindIII-Rev | CAGCTAAGCTTTCCAATCATTCACGCTCACC | deletion of *murQRP* operon in *B. subtilis* |
| pX-*murQ*\_Fw | CGCGGATCCATGTCAGAACCATTA | Integration of *ybbI* gene in in the *amiE* site of 168 ∆*ybbI* mutant |
| pX-*murQ*\_Rev | CGCGGATCCTCATGGATGGTAATGTTC | Integration of *ybbI* gene in in the *amiE* site of 168 ∆*ybbI* mutant |
| Up*4307*FwE | CCGAATTCGACGTCGACCTCCTC | deletion of *SCO4307* (*murQ*) gene in *S. coelicolor* |
| Up*4307*RevH | GCAAGCTTCATGTCACTCCCCACC | deletion of *SCO4307* (*murQ*) gene in *S. coelicolor* |
| Nlo*4307*FwH | CCAAGCTTATCCTGGTCCTGCTGG | deletion of *SCO4307* (*murQ*) gene in *S. coelicolor* |
| Nlo*4307*RevB | AAGGATCCGAACTCAAGGGCCGTG | deletion of *SCO4307* (*murQ*) gene in *S. coelicolor* |
| Kn*4307*Fw | TCACCCAGAAGATGCT | verification of *SCO4307* (*murQ*) gene deletion in *S. coelicolor* |
| Kn*4307*Rev | CTTCAGAATCGCACAC | verification of *SCO4307* (*murQ*) gene deletion in *S. coelicolor* |

Enzyme restriction sites are underlined