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

| Primers | Sequence (5'-3') | Purpose |
| --- | --- | --- |
| Mutant construction primers | | |
| arcA-F | CAATCCGCAAACGACCAAACCC | Identification of *arcA* mutant |
| arcA -R | GGTAAACGACGGGCTCAGATAG |
| arcA -1 | cg**ggatcc**CTGGCAGGTGCGCTGATAATTC | Amplification of *arcA* upstream sequence |
| arcA -2 | TCAACAACTCGGCACGTGACTGTATGTTATGCATCTCGGCGCCG |
| arcA -3 | CGGCGCCGAGATGCATAACATACAGTCACGTGCCGAGTTGTTGA | Amplification of *arcA* downstream sequence |
| arcA -4 | gg**actagt**GTTACCGCTTAATGGTCTTCGG |
| arcB -F | TAATGGAATGAACCTCGCGGA | Identification of *arcB* mutant |
| arcB -R | CGCGATGCAAATGAAGCCAAT |
| arcB -1 | cccctgcaggtcgacggatccCAAAAATTAATCAATATGTTTGGTGGG | Amplification of *arcB* upstream sequence |
| arcB -2 | tctgttgGTAATACTGCGCCAACAGCCTG |
| arcB -3 | ggcgcagtattacCAACAGATTCAGACCACGACATTAC | Amplification of *arcB* downstream sequence |
| arcB -4 | cggactatagactatactagtTGGATAGTGGATGGATTTTTCCG |
| bcsA-F | TTAAACGTGGCCTCAGTTCG | Identification of *bcsA* mutant |
| bcsA-R | CCTCCGGCAACGTCAAC |
| bcsA-1 | cccctgcaggtcgacggatccGGCCATGACGGAACTGGC | Amplification of *bcsA* upstream sequence |
| bcsA-2 | ggcgttatcatgcCATCGATTATCCTGATATTTAATTGATG |
| bcsA-3 | atcgatgGCATGATAACGCCACGTTTTG | Amplification of *bcsA* downstream sequence |
| bcsA-4 | cggactatagactatactagtGCCGTAGCCGTCCATCCG |
| bcsB-F | GCATTTCCAGTTTGGTTTGCC | Identification of *bcsB* mutant |
| bcsB-R | CGGACTATTGCCACCGGG |
| bcsB-1 | cccctgcaggtcgacggatccCTCAATATTATTCATGCCTCAGCG | Amplification of *bcsB* upstream sequence |
| bcsB-2 | tatccgttcccgcGACAAAACGTGGCGTTATCATG |
| bcsB-3 | ttttgtcGCGGGAACGGATAAAAAATAAG | Amplification of *bcsB* downstream sequence |
| bcsB-4 | cggactatagactatactagtCAATATTTGCAACCCTTCACGC |
| bcsC-F | TGACCGTGACCACATTGC | Identification of *bcsC* mutant |
| bcsC-R | CTGACCGAAGCGCATTT |
| bcsC-1 | cccctgcaggtcgacggatccTAAGACTCCGAGCATGTGGGC | Amplification of *bcsC* upstream sequence |
| bcsC-2 | tttaccCATACGTAGCTCGCTTATTTTTTATCC |
| bcsC-3 | gcgagctacgtatgGGTAAATAAGCATGAGTGACCTGC | Amplification of *bcsC* downstream sequence |
| bcsC-4 | cggactatagactatactagtGAGGGATTCAGGACCACATAACTG |
| bcsD-F | AGCCTGCTTTCTTATGTTGG | Identification of *bcsD* mutant |
| bcsD-R | GAGTAGTAATCTTCCGCAGC |
| bcsD-1 | cccctgcaggtcgacggatccAACGTACAACTGAGCTACGATAACG | Amplification of *bcsD* upstream sequence |
| bcsD-2 | ccggctcaatgCATGCTTATTTACCTCCGAGCC |
| bcsS-3 | ataagcatgCATTGAGCCGGGGGATAAC | Amplification of *bcsD* downstream sequence |
| bcsD-4 | cggactatagactatactagtCCGCCAGTAAGCCGCCCT |
| CarcA-HF | gtcgacggtatcgataagcttCATAACCTCCCAAACGACACCT | Amplification of *arcA* complementary sequence |
| CarcA-BR | cgctctagaactagtggatccGAATCAGCCTTCCAGATCACCG |
| Cfis-HF | CCCaagctt ATCCAGCGTTGGTCA | Amplification of *fis* complementary sequence |
| Cfis-BR | CGggatccAGGAGGCTCGTGTCTGT |
| CohrR-HF | CCCaagcttCCCTGATTGACGAGTCG | Amplification of *ohrR* complementary sequence |
| CohrR-BR | CGggatccCATGTGCAACGTAGAGAAC |
| MCS-F | GGCTCGTATGTTGTGTGG | Sequencing primers of pBBRI-MCS4 |
| MCS-R | AGCTGGCGTAATAGCGAAGA |
| pKNG-F | GACACTGAATACGGGGCAAC | Sequencing primers of pKNG 101 |
| pKNG-R | CCCCTGGATTTCACTGATGA |
| ArcA protein expression primers | | |
| pET32a-arcA-BamHI-F | gccatggctgatatcggatccATGCAGACCCCCCACATTCT | Prokaryotic expression of ArcA |
| pET32a-arcA-HindIII-R | ctcgagtgcggccgcaagcttTCAGCCTTCCAGATCACCGC |
| pET32a-arcB-BamHI-F | gccatggctgatatcggatccGAAGAGTCTCGCCAGCGCC | Prokaryotic expression of ArcB |
| pET32a-arcB-HindIII-R | ctcgagtgcggccgcaagcttTCATTTTTTTTCAGCCTCCGA |
| pET32a-arcA∆REC-F | gccatggctgatatcggatccCTGCTGTCCCGCACCATG | Prokaryotic expression of ArcA∆REC |
| pET32a-arcA∆REC-R | ctcgagtgcggccgcaagcttTCAGCCTTCCAGATCACCGC |
| pET32a -F | TAATACGACTCACTATAGGG | Sequencing primers of pET32a |
| pET32a -R | GCTAGTTATTGCTCAGCGG |
| RT-qPCR primers | | |
| 16s1369F | CGGTGAATACGTTCYCGG | Reference gene of qRT-PCR |
| 16s1541R | AAGGAGGTGATCCRGCCGCA |
| ohrR-F | TGGCGATGAACAAGTTATATC | qRT-PCR of *ohrR* |
| ohrR -R | ACCAGCATCACCAGATAC |
| fis-F | AACTCTCAGGCTCAGGTA | qRT-PCR of *fis* |
| fis-R | CTCATACAGGTCATTCACATC |
| slyA-F | CAAAGGGTTAATTACCCGACA | qRT-PCR of *slyA* |
| slyA-R | ATCTAATATTTCGCCGCGTG |
| bcsA-F | TGACGCTGATACTGATTA | qRT-PCR of *bcsA* |
| bcsA-R | ACATAGAACTCGGCAATA |
| bcsB-F | AATCTGACGGTGAATAAG | qRT-PCR of *bcsB* |
| bcsB-R | TGACTCTTGATATTGTTGT |
| bcsC-F | CAATGGGATGATGGATAG | qRT-PCR of *bcsD* |
| bcsC-R | GGACAATACCTGATTCAT |
| bcsD-F | AGAATGTGAAGAGCAATA | qRT-PCR of *bssS* |
| bcsD-R | TGACCGTAACTGTAATAG |
| zmsA-F | CAGGATTATCAGTCAGTAGA | qRT-PCR of *zmsA* |
| zmsA-R | GTGCTCATTGCTATTCAG |
| bssS-F | TACCGTTGACAGTTATGA | qRT-PCR of *bssS* |
| bssS-R | GCCTCAAGGATAGAGATAA |
| FhlC-F | GCGATAAGCCTTGATAAC | qRT-PCR of *fhlC* |
| FhlC-R | GAACATCCACTCTTCCAT |
| FhlD-F | GGATTCTTGTGTTAATAGC | qRT-PCR of *fhlD* |
| FhlD-F | GGGTATCAATGAGGAAAT |
| FliA-F | CGCCACTCATCGTAAGAA | qRT-PCR of *fliA* |
| FliA-R | ACATCTCGTTAGAGGAATATCG |
| FliG-F | AAACGAACAGAAAGCCATT | qRT-PCR of *fliG* |
| FliG-R | TCACCACCACCGATAATC |
| FliM-F | ATCAAGATTCAGCCGTAT | qRT-PCR of *fliM* |
| FliM-F | CTTCAGGTGTATCAGGTT |
| DNA sequence amplification of promoters | | |
| zmsA-F | ATTCAGTGCTGCTGTGGTTTC | Amplification of *zmsA* promoter region sequence |
| zmsA-R | TCCGACAATTGCAATGTCACTTG |
| OhrR-F | CTGAACTGGGTGAGCGTCTG | Amplification of *ohrR* promoter region sequence |
| OhrR-R | CATGTGACTCCTTTGAGTGGATTATATTC |
| slyA-F | AGCCGACCCTGTTTTAATCG | Amplification of *slyA* promoter region sequence |
| slyA-R | CAACGAAGGCTGTTCTATTCCAATC |
| fis-F | GCAGAGTGTTTCCATTCCCG | Amplification of *fis* promoter region sequence |
| fis-R | AGTTCTGTCAGCTCTTTTTCTGTTTAC |
| bssS-F | TTATGCCGCCTCGAATAACC | Amplification of *bssS* promoter region sequence |
| bssS -R | CACAAGCGGGTGCGTTTG |
| bcsA-F | ACCACCGCAAAGGTTCTTAC | Amplification of *bcsA* promoter region sequence |
| bcsA-R | CATCGATTATCCTGATATTTAATTGATG |
| PelE-F | TTTCTGGTGACGCTGATTGC | Amplification of *pelE* promoter region sequence |
| PelE-R | CATCCTTGCAGCCCCCATAC |
| \* The underlines are the site of restriction endonuclease | |  |