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

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| **Primer name** | **Sequence (5′ to 3′)a** | **Application or target** |
| DoeAFDoeAR | AACATATGATTGAACGCGACGACATTAAGCTTAGCCCCGTATTCGGGT | *doeA* gene |
| DoeBFDoeBR | AACATATGGCCATACAGTGGGATCATTAAGCTTTGCTCGTTCCTTAACGTCA | *doeB* gene |
| doeAmutF1doeAmutR1 | TTAGATCTGCATGGATTTGGAACCGGACATTGGTACCAGTTCGTCGATTCGGCGTT | upstream and 5′-fragment of *doeA* for deletion of the gene |
|  doeAmutF2doeAmutR2 | TACCGCGGACGAAGGTTACATCATCATTGAGCTCTCCAATCGGCATAGG | downstream and 3′-fragment of *doeA* for deletion of the gene |
| doeBmutF 1doeBmutR1 | ATAGATCTATGGAGTAGTTCAAAATTCGGCTTGGTACCGGACATGACGGCCACA | upstream and 5′-fragment of *doeB* for deletion of the gene |
| doeBmutF 2doeBmutR2 | TTGGGCCCTTTCGCTTTAATCGGCACTTGAGCTCTGTTGTGGCCGAAATTGAGTAC | downstream and 3′-fragment of *doeB* for deletion of the gene |
| DoeA(HSG575)DoeA(HSGstop) | TTGGATCCTGATGGAGGAGATATTATGATTGAACGCGACGACATGACTCAAGCTTTCAAGCCCCGTATTCGGGTTTC | for cloning of the *doeA* in pHSG575 |
| ectABC\_F(Sac)ectABC\_R(Vsp) | AGAGCTCAGGAGTATTTATATGTTGCCTGATAATTAATCCTCTCTTACTTCGTGGAT | for cloning of *ectABC* operon |

a Restriction enzyme recognition sites are underlined