**Table S1. Oligonucleotide primers used in this study.**

|  |  |
| --- | --- |
| **Primer** | **Sequence (5’ to 3’)** |
| **For qRT-PCR** |
| *pnpR*-497F*pnpR*-685R*pnpC1*-277F*pnpC1*-456R*pnpB*-275F*pnpB*-441R*pnpA*-539F*pnpA*-742R*pnpC1b*-117F*pnpC1b*-279R*pnpC2b*-565F*pnpC2b*-811R*pnpDb*-987F*pnpDb*-1180R*pnpAb*-514F*pnpAb*-719R 16S-1310F16S-1466R*crc*-111F1*crc*-273R1*crcZ*-32F1*crcZ*-186R1*crcY*-64F2*crcY*-267R2**For Disruption***pnpC1*-F*pnpC1*-RC1T (712) FC1T (1702) RC1b1777FC1b2807RpJQ51FpJQ383RC1b5754FC1b6936R*ins2*-F-TYB-320F*ins2*-F-TYB-789R*ins2*-R-TYB-1200F13*ins2*-R-TYB-1851R13*ins2*-YZ1-140F*ins2*-YZ1-1892R*ins2*-YZ2-30F*ins2*-YZ2-360R3566-F3566-RpJQMCS-3566FpJQMCS-3566R3566T-F3566T-R | GCATGTCACCCCAATACGCAATCGCGCAACAGGTGAACCTAGACACACCTTTGGCAGCGGACCTTTGATGGTTTGCATGAACACGCTACCCACCTCCATCCCTTATGCCACGGGAAAATCGGCCTGACGTCTTCAGCCTCGGAGATGTCGCTCAGAACTCCAAACCCGAGCTTGAGGAACTCCACACCGGTCAATCGCCAGTTTTTTCGTCGGACATCTGGACGACCGTGTACTGAGCTACAGCTGAAACGCACCACGGTAAGCATCTGGGGGTGAGTATCTCGGCCTCGGACAATGCAACTCGACTGCGTGAAACCGTGGTAACCGTCCTCACTCGATGACCCAGCTTTCCTTGCAGGTAACGCCCGTAGCAAGACGAAACGGCTCACGCTCGATCCAACCAGTTCAGGCCAGAGGCGTAGCAAGCAGATTTGTCAGCCTGTCCTGGTGTCTTGTTCTCGGAAGGGATTAACTGTTGTCGTCGCCTGTGTATTGCGAGTACCGATGACGCTCGGCGAGGAACCCAGTTTGATCGTCAAAAACGGCCGGTCGAGGAAAATGTCGGCGGGAATCAGGTTTTCCCAGTCACGACGTTGTAACCTCACTCATTAGGCACCCCAGCATCAAGGCTCGCAGGAAATCAAGCGCGGTTACTGGTCTAGAGCCATCCCGATTGAACTCTTGGCTAACGCACCTTAGTTAGCCAAGAGTCTAAAGACGTCCACGGAGCTCAGTAGATTGATGACTTGCGGTGACCTGATAGCTGCCGCAATCGCTTCACGGTTTCAAGGCTGCGGTAGCGAAACTCTAGGTGCGCTGTCGGTACTACATGCTATTACACCGATTGCCAGGTATCGGTCTGGTAGTCCTTTTCCCAGTCACGACGTCACTCATTAGGCACCCCAGCCCTGTTGTTTTGTCGCGGGTAGTAACGGGAGAT |
| **For validation of operon prediction** |
| pnp-*orf2*-1034F | AGAAATGGTGGCGAGTATCC |
| pnp-R-1623R | ATGAACTGCTCCAACTGCTG |
| pnp-R-2252F | ATTCCGGTGTTGCCAGAGTAC |
| pnp-C1-2831R | TGCCAAAGGTGTGTCTAGCT |
| pnp-C1-2978Fpnp-C2-3323Rpnp-C2-3907Fpnp-D-4516Rpnp-D-5356Fpnp-E-5684Rpnp-E-6381Fpnp-C-7001Rpnp-C-7392Fpnp-X1-7710Rpnp-X1-7738F2pnp-X2-8287R2pnp-X2-8177Fpnp-B-8775Rpnp-B-9041Fpnp-A-9611Rpnp-A-10560Fpnp-*orf3*-11177Rpnp-Ab-20558Fpnp-*iclR*-21077Rpnp-*pnpR1*-19135Fpnp-Ab-19741Rpnp-C*1*b-2178Fpnp-C*2*b-2679Rpnp-C*2*b-3204Fpnp-Db-3823Rpnp-Db-4880Fpnp-Eb-5283Rpnp-Eb-6062Fpnp-Cb-6574Rpnp-Cb-7122Fpnp-X*1*b-7300Rpnp-X*1*b-7228Fpnp-X*2*b-7825R | AACCATCAAAGGTCCGCTGTAGCCATAGAAAAAGCCCCAGCGACAAGGACGAAGGCAATCAAGTAACGGAAGCAGGCAGCTTGAAACCGACGAAGAAGCGTCGGCAGGCTTTGGTAGACAATACACTCGGCGGCACATTCACCTTGCCGTCACACTTCTGTGTAGGCGAGATGCTTGACGAGAGCCTTCATTGTCGGTGGACCCACAGAGCCCATTTGCGATCCACCCTTACCTCCACACGGCAAAGTCCTGATGTGTGCCCCAGGAAACCACCATCACCAGAGCAGCGTGACCTCAACATCGACAACGACCACACCCTCAAAAGGTGCTGGACGAGTATTC GTGTCGATCTGAAAAGCCTGGCTGACCGAACTCAACGAACGATAGCATCAAGGAAGCG TGGTGATGACCGACTTTGCCAGGATGAGGGTGAAACGTCGCTCAGAACTCCAAACCC ATGGGGTGGACTGGCTTTCGGACGAGCCGGAAGTTCATCAATGCGGGTGATCAACGATCACCGTGGTGCGTTTCAGCCAGGCGTTCGATCTCTTCGGTGGGTGCATTGTTGTACGAGGGTGTCCGACAACAAAACGATGATTTGTCCGCCGATGAACGCAAATGCGCCTGATGCCACCGATCATCCCGATCCAGGCGTATTGGCACTGA |