**Supplementary Information**

Supplementary information below contains supplementary materials and methods as well as legends for supplementary figures that are referenced throughout the main text.

**Table S1. qPCR primers targeting 16S and stress genes**

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| --- | --- | --- |
| Primer name | Primer target | sequence |
| F5 | XH001 16S | 5’-GCGGAGCATGCGGATTA-3’ |
| R3 | XH001 16S | 5’-AACGTGCTGGCAACATAGGG-3’ |
| STRS1F | Potassium efflux system KefA protein | 5’-AAGACGTACGCCGTGCTCGTCATC-3’ |
| STRS1R | Potassium efflux system KefA protein | 5’-GTGCCGAGTTGAGTCGTCGTTAGC-3’ |
| STRS7F | Potassium uptake protein | 5’-CTGATCCTTGCATTCGTGG-3’ |
| STRS7R | Potassium uptake protein | 5’-GGACGAGCGCGAGTTAACG-3’ |
| STRS2F | Heat shock protein 60, GroES | 5’-AAGGAGAAGCCGCAGGAAG-3’ |
| STRS2R | Heat shock protein 60, GroES | 5’-GTCGTACTTGACCTCGGTGC-3’ |
| STRS3F | Chaperone protein DnaJ | 5’-ACGGTAAGAAGACCGTGACG-3’ |
| STRS3R | Chaperone protein DnaJ | 5’-GAATCTGAACGTCCACGTGC-3’ |
| 0867F | Universal stress family protein | 5’-GAGGGAATGGATACTGCGAT-3’ |
| 0867R | Universal stress family protein | 5’-GTGGAGAACTCGATGAGCAG-3’ |
| 0069F | NADPH-quinone reductase | 5’-ATGTCCAACGTGCTGATTGT-3’ |
| 0069R | NADPH-quinone reductase | 5’-ACTCCGGATAGAGGTCATCG-3’ |

**Supplementary Methods**. This section contains detailed procedure regarding disaggregation of coculture, XH001 cell quantification, re-attachement of TM7x to XH001, isolation of mRNA, construction of cDNA, and qPCR of key stress genes.

*Disaggregation of micro-aggregated XH001/TM7x*

XH001/TM7x coculture tends to form micro-aggregates and in order to accurately quantify the cell length and branch points, we attempted to disperse the micro-aggregates using different reagents, including complexing agents: EDTA, EGTA, sodium pyrophosphate, sodium citrate and sodium potassium tartrate, sugars: D-glucose, L-arabinose, L-fucose, D-galactose, D-mannose and N-acetyl-glucoseamine, denaturant: urea and formamide, detergents: SDS and Triton x-100, hydrolytic enzymes: proteinase K and lysozyme, and reducing agent: L-cystein. We also tried physical separation including vigorously pipetting or mild sonication. Sonication was carried out by using 60 Sonic Dismembrator (Fisher Scientific) with power output setting between 2-3. Our data demonstrated that only mild sonication resulted in dispersed cells, although we observed that a small amount of cells also lysed during the sonication, particularly the longer and swollen cells (data not shown). Therefore, quantification in Figure 2 is an underestimation of cell length and branching.

**Supplementary Reference**

Pfaffl, M.W. (2001). A new mathematical model for relative quantification in real-time RT-PCR. Nucleic Acids Res. *29*, e45.