**Table.S1 Bacteria strains and plasmids used in this study**

|  |  |  |
| --- | --- | --- |
| **Strains and plasmids** | **Relevant characteristics** | **Source or reference** |
| **Strains** | | |
| *L. paracasei* L9 | Host strain | Isolated from the feces of healthy  Yang *et al*., 2015 |
| *E.coli* DH5α | F-ϕ80d*lac*ZΔM15, Δ (*lacZYA–argF*) U169, *deoR, recA1, endA1, hsdR17* (rK-, mK-), *phoA, supE44, λ- , thi-1, gyrA96, relA1.* Host strain for pUC vectors | TIANGEN |
| L9mleS- | *L. paracasei* L9 with *mle*S gene interrupted | This work |
| **Plasmids** | | |
| pUC19EM | Suicide plasmid carried a EmR cassette, derivative of pUC19 AmpR, EmR | Yang *et al*., 2017 |
| pUCmleS | pUC19EM containing partial sequence of *mle*S | This work |