**Supplementary** Fig. S1**.** Megaplasmid pangenome of *C.butyricum* F1-b and F1-5 compared with reference strain *C. butyricum* KNU-L09 (accession no. NZ\_CP013252).

Beginning from the inside outward, the following features are represented: GC content (black); GC skew (green and purple); *C. butyricum* KNU-L09 plasmid (red); *C. butyricum* F1-b plasmid (green); *C. butyricum* F5-b plasmid (blue); transport genes (shown in green font), putative mobile element (shown in purple font), phage genes (shown in black font) and CRISPR-Cas (shown in light-blue font).

**Supplementary** Fig. S2.Phylogenetic tree of 2 *C. butyricum* isolates identified in this study with 16 *C. butyricum* strains from NCBI.