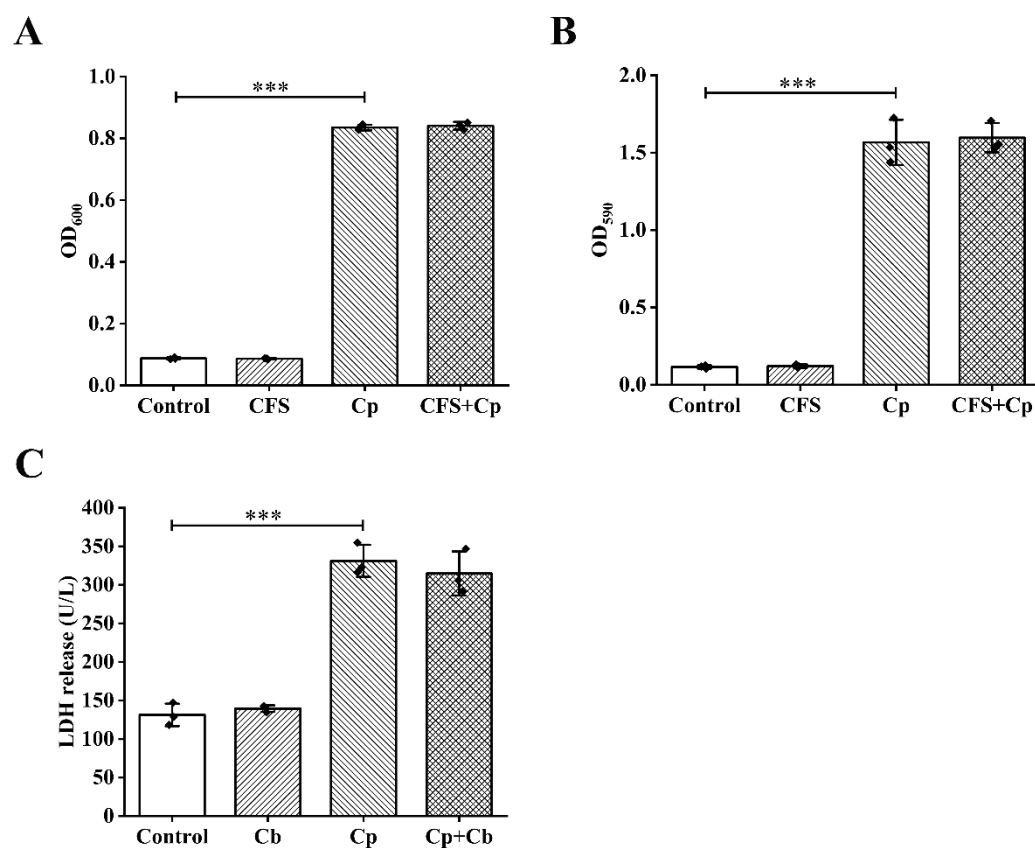
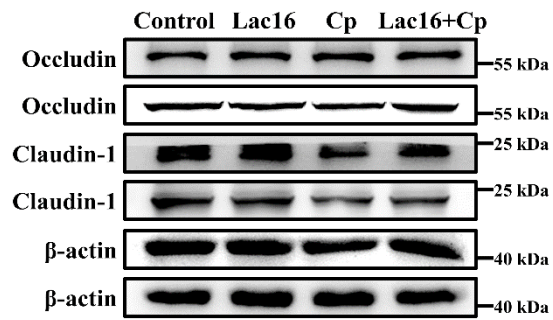
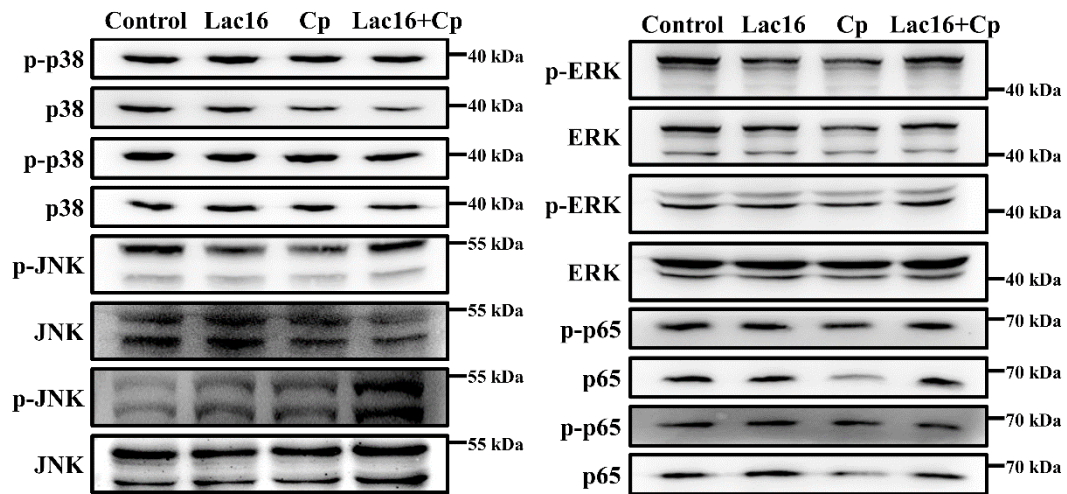


**Figure S1.** Agar well diffusion assays of different probiotics on *C. perfringens*. (A) *B. licheniformis*. 1 and 2: Luria-Bertani (LB) broth; 3 and 4: *B. licheniformis* fermentation supernatants. (B) *B. coagulans*. 1 and 2: LB broth; 3 and 4: *B. coagulans* fermentation supernatants. (C) *L. plantarum* Lac16. 1 and 2: MRS broth; 3 and 4: *L. plantarum* Lac16 fermentation supernatants. (D) *C. butyricum*. 1: 100  $\mu$ g/mL of ampicillin; 2: RCM broth; 3-5: *C. butyricum* fermentation supernatants.



**Figure S2.** Evaluation of antibacterial effect of *C. butyricum*. (A) The growth of *C. perfringens* in different groups was measured by OD<sub>600</sub> after 12 h of incubation. (B) Biofilm formation was measured by OD<sub>590</sub>. (C) Concentrations of LDH in the supernatants of IPEC-J2 cells infected with *C. perfringens* for 1 h. Data are presented as the means  $\pm$  SD for n = 3; \*  $P < 0.05$ , \*\*  $P < 0.01$ , \*\*\*  $P < 0.001$  ( $t$  test).

**A****B**

**Figure S3.** The rest of protein bands in the manuscript. (A) The rest of protein bands in panel D of Fig. 4. (B) The rest of protein bands in panel A of Fig. 7.