Introduction:
Impairment of intestinal mucosal barrier function is the initiating factor of sepsis. In order to explore the effect of lactic acid bacteria on intestinal barrier function impaired by sepsis, it is necessary to establish sepsis and lactic acid bacteria ecological models. However, how to construct these models is still unclear.

Methods:
Co-cultures with a gradient of lactic acid bacteria and Caco-2 cells were constructed. The symbiotic state was observed under an inverted microscope and lactate dehydrogenase (LDH) toxicity tests, transepithelial electrical resistance (TEER) tests and Western blots were used to determine effective concentrations of lactic acid bacteria in monolayer cell models. Lipopolysaccharide (LPS) was used to treat cells, and Cell Counting Kit-8, quantitative reverse transcription PCR (RT-qPCR) and enzyme linked immunosorbent assays (ELISA) were used to determine the appropriate concentration for sepsis models.

Results:
The number of living cells decreased significantly when the MOI (number of lactic acid bacteria/cell number) reached 8 (Figure 1a b). The release of LDH indicated that damage to cells began to increase when the MOI exceeded 10 (Figure 2a b). At an MOI of 0.5, resistance values began to increase over time, whereas resistance values began to decrease when the MOI reached 10 (Figure 3). As the number of lactobacilli increased, the expression of tight junction protein increased and then decreased (Figure 4a b c). In sepsis model experiments, the cell survival rate began to decrease once the concentration of LPS exceeded $10^4$ ng/ml (Figure 5). RT-qPCR results showed that $10^2$ ng/ml LPS significantly increased inflammatory cytokines (Figure 6), and ELISA results consistently showed that TNF-α and IL-6 increased significantly when LPS concentrations reached $10^2$ ng/ml (Figure 7a b).

Conclusion:
It is feasible to construct a cell monolayer model of lactic acid bacteria and LPS. The appropriate MOI of lactic acid bacteria is 0.5 and the optimal concentration of LPS is $10^2$ ng/ml.
Results