



Supplementary Fig. 1. Two plasmid systems used for the production of butyrate. (A) Structure of constructed plasmid vectors and preparation of butyrate-producing recombinant atEc strain. Plasmids pKM212-*ter-crt-tesB* and pKA312-*hbd-atoB* were used for the production of butyrate and transformed into atEc strain. Bacterial strains and plasmids used in this study were described in Supplementary Table 1. All bacterial strains used for the mice group were incubated with appropriate antibiotics and pre-cultured in 25 mL test tubes containing 10 mL LB medium at 37°C, 16 hours in a rotary shaker at 220 rpm. One milliliter of 16 hours culture was used to inoculate 250 mL flask containing 100 mL LB medium, recombinant microbial strains were induced by 0.05 mM isopropyl-β-D-thiogalactopyranoside (IPTG) when the absorbance (OD600) reached about 0.4. Afterward, induced culture cells were harvested at the absorbance (OD600) reached about 1, and 1 mL of each culture medium was washed twice and suspended with 1 mL PBS solution. (B) Butyrate production in recombinant atEc strains. Butyrate productions from bacteria were measured using HPLC (Agilent, Palo Alto, CA, USA) as the previous report.⁷ Butyrate-atEc strain was used to DSS-induced colitis mouse model. atEc, atypical *Escherichia coli*-treated; DSS, dextran sulfate sodium DSS-treated.