

**Figure S1. Flow gating strategies for each cell population.**

**Figure S2. Effects of BBR against DSS-induced colitis after pre-treatment with ABX.**

(A) Schematic diagram illustrates the experimental design. (B) DAI changes of each group. (C) Measurement of the length of colons harvested from mice in each group. (D) H&E staining (Bar=200um above, Bar=50um below) sections and histological scores of colon tissue from mice in each group. Data are presented as mean  $\pm$  SD. \* $P$ < 0.05, significantly different as indicated.

**Figure S3. BBR repaired the integrity of intestinal epithelial barrier in colitis mice.**

(A) Paneth staining(Bar=200um above, Bar=50um below) sections of colon tissue from mice in each group. (B) The MLNs and liver FITC-dextran concentrations of mice in each group. (C) The colonic mRNA level of *Muc2* in each group were measured by qPCR. (D) The mRNA levels of *Occludin* and *Zo-1* in Caco2 cells from each group were measured by qPCR. Data are presented as mean  $\pm$  SD. \* $P$ < 0.05, significantly different as indicated.

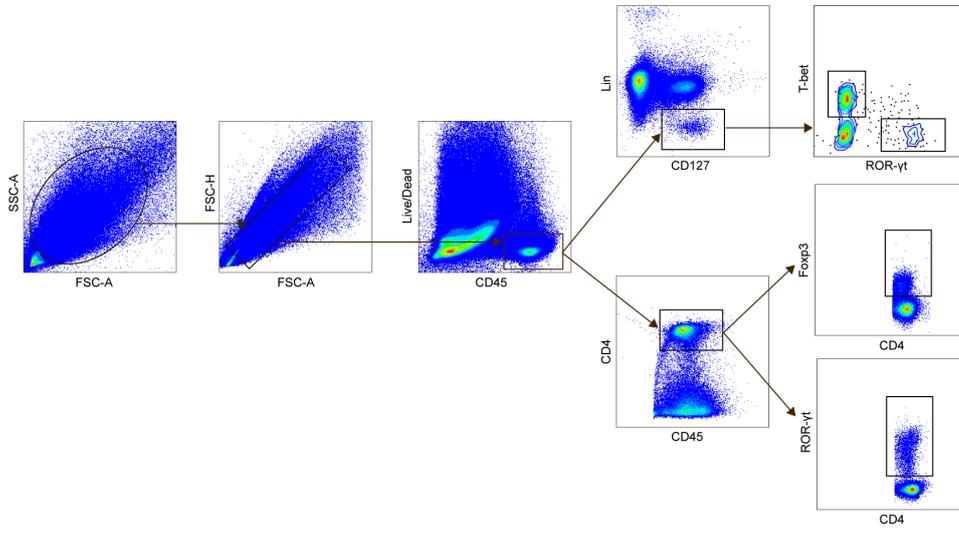
**Figure S4. BBR regulates the expression of cytokines in the colon.**

(A) The concentration of inflammatory cytokines in each group were measured by ELISA. Data are presented as mean  $\pm$  SD. \* $P$ < 0.05, significantly different as indicated.

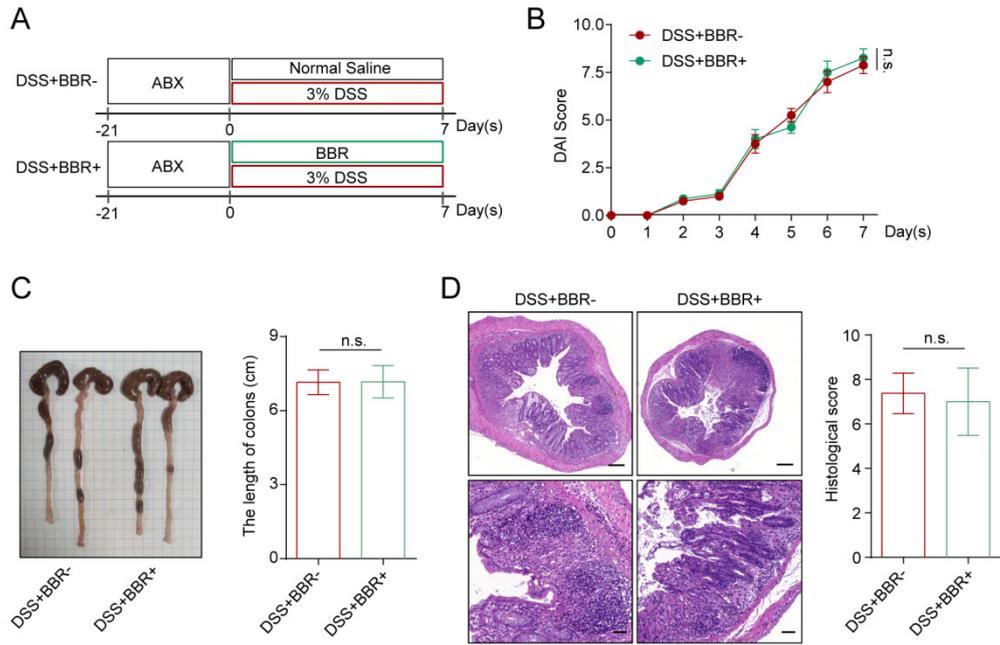
**Figure S5. BBR treatment significantly alter the proteomics of colon tissue.**

(A) Volcano graph of the distribution of the different protein in DSS-BBR- and DSS+BBR- groups, the red dots represents up-regulated proteins and green dots represent down-regulated proteins. (B) Hierarchical clustering of proteins in DSS-BBR- and DSS+BBR- groups. (C) GO biological process analysis in DSS-BBR- and DSS+BBR- groups. (D) KEGG pathways analysis in DSS-BBR- and DSS+BBR- groups.

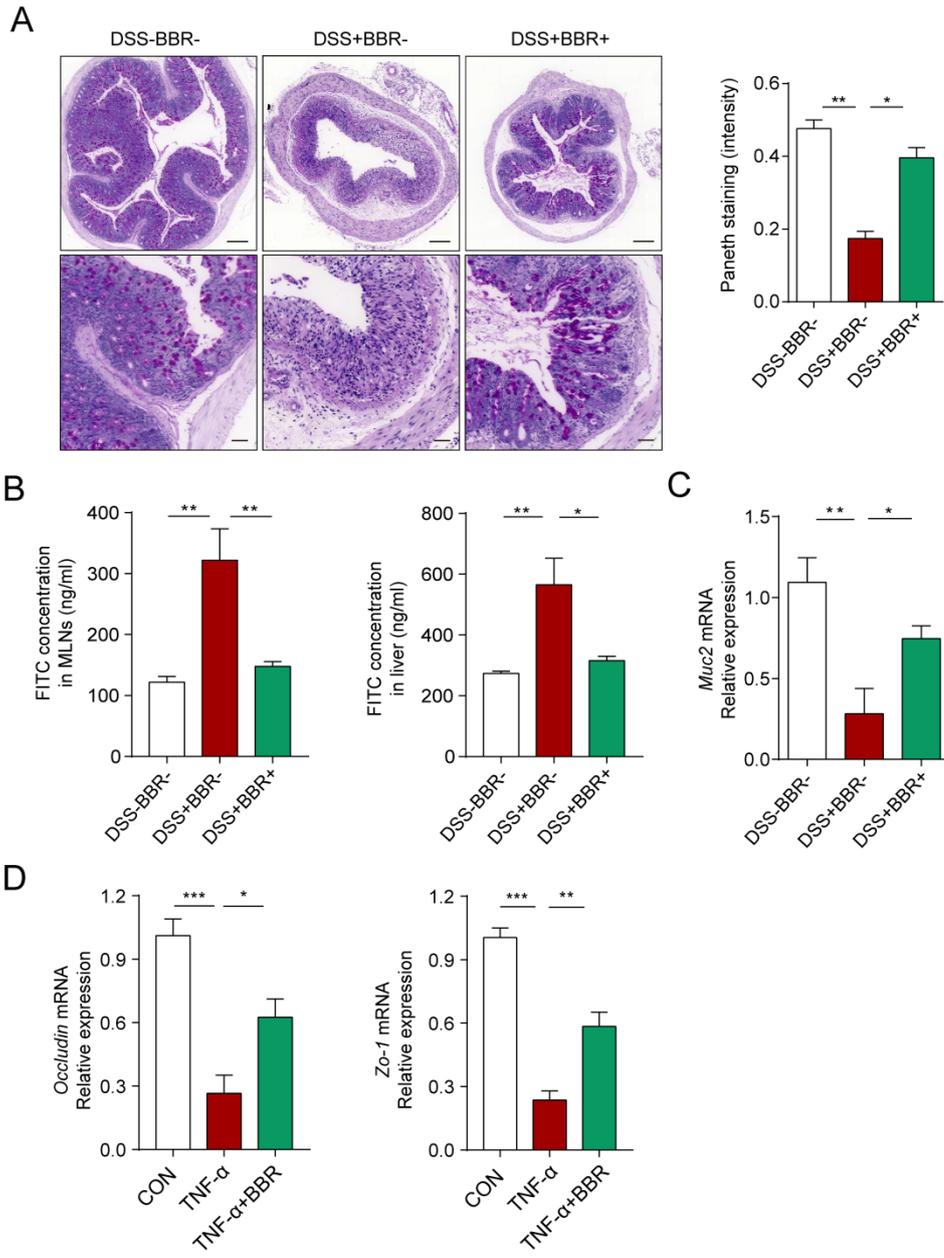
**Figure S1**



**Figure S2**

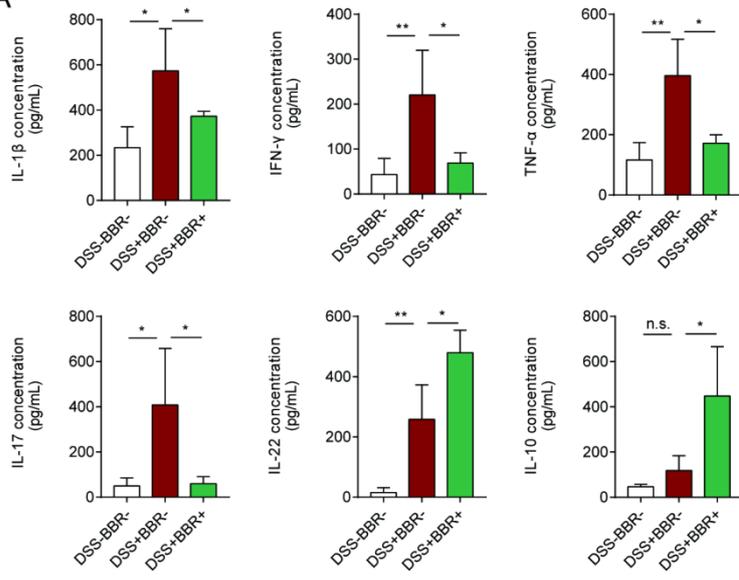


**Figure S3**



**Figure S4**

**A**



**Figure S5**

