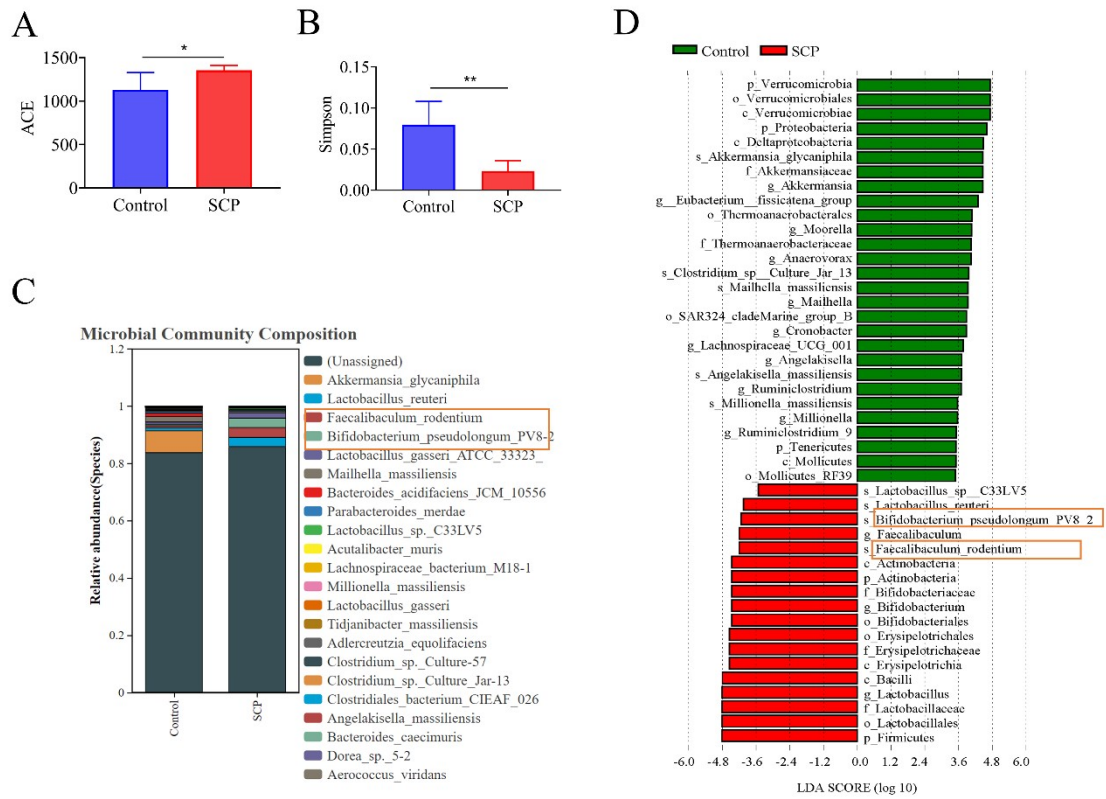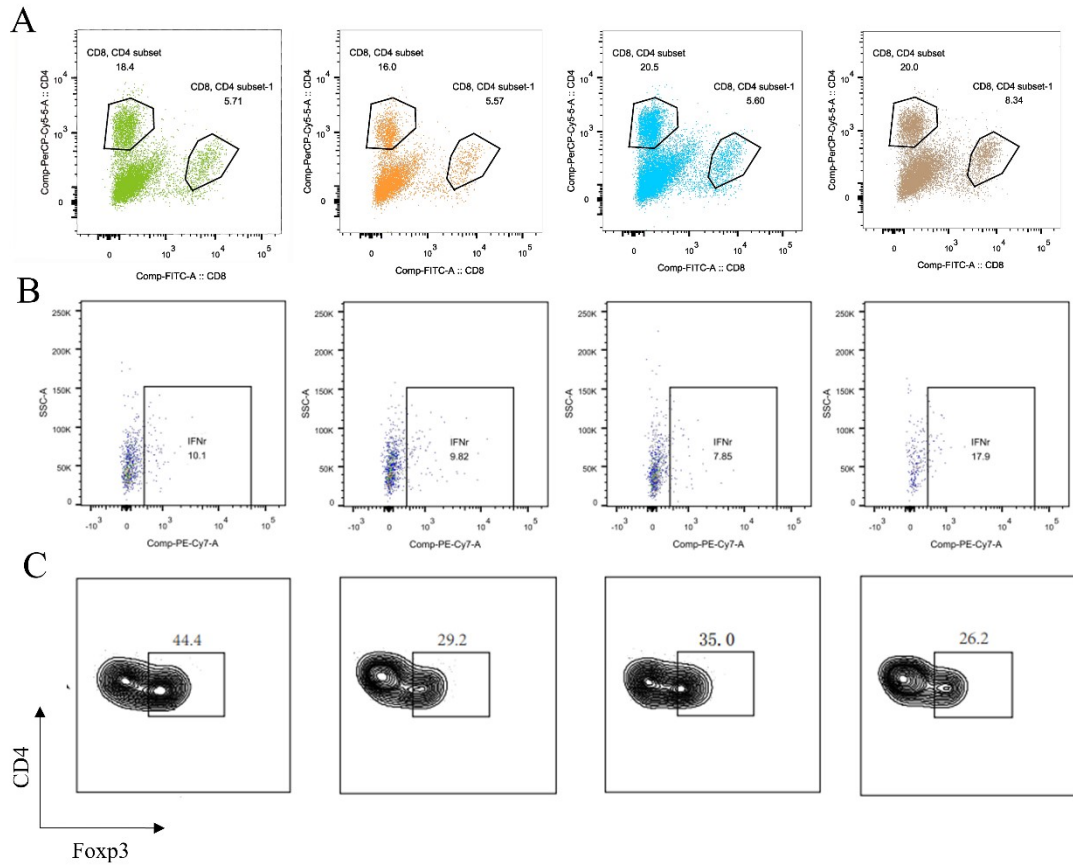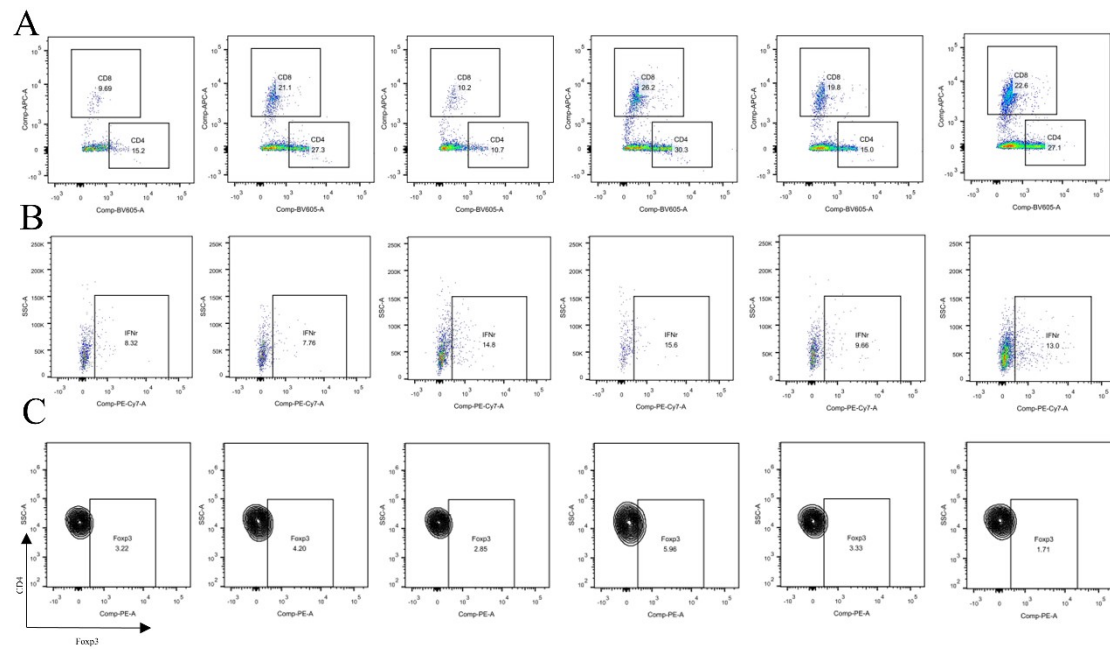Supplementary Figure 1. Representative cytometry plots of CD4+ T cells (A), CD8+ T cells

(B), INF-γ+ CD8+ T cells (C) and Foxp3+ CD4+ T cells (D) in tumor tissues of mice in Control,

Control+anti-PD1, SCP, and SCP+anti-PD1 groups.

Supplementary Figure 2. (A) ACE and (B) Simpson index of gut microbiome in mice treated with or without SCP for ten days. ((C) Relative abundance of bacteria in mice from different groups. (D) LEfse analysis of microbiota of mice from different groups.

Supplementary Figure 3. Representative cytometry plots of CD4$^+$ T cells (A), CD8$^+$ T cells (B), INF-γ$^+$ CD8$^+$ T cells (C) and Foxp3$^+$ CD4$^+$ T cells (D) in tumor tissues of recipient mice transferred with microbiota from different groups followed by anti-PD-1 treatment.

Supplementary Figure 4. Representative cytometry plots of CD4$^+$ T cells (A), CD8$^+$ T cells (B), INF-γ$^+$ CD8$^+$ T cells (C) and Foxp3$^+$ CD4+ T cells (D) in tumor tissues of antibiotic-treated mice and *Bifidobacterium_pseudolongum-* or Faecalibaculum_rodentium-treated mice with or without anti-PD1 treatment.