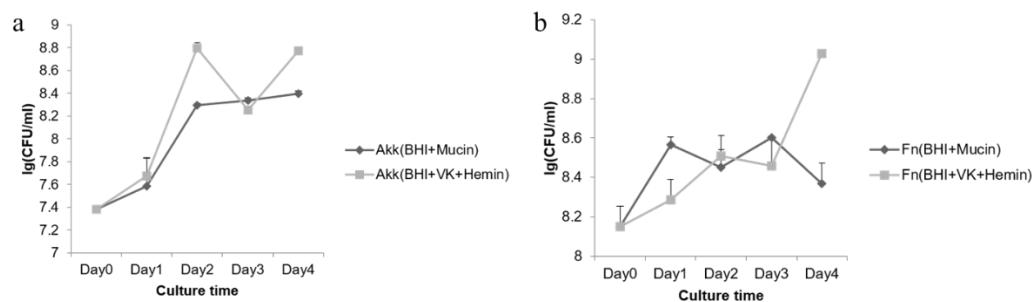
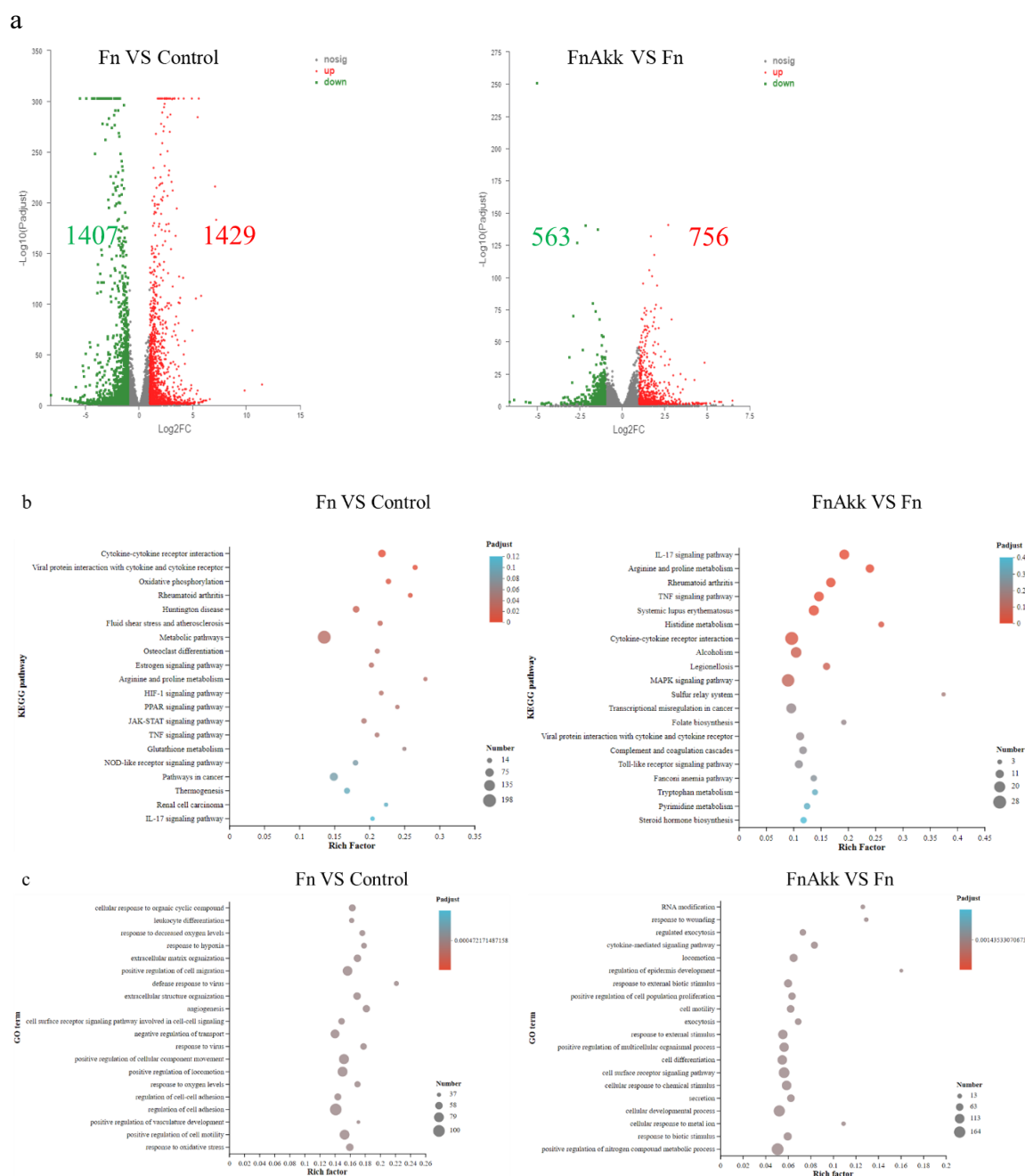


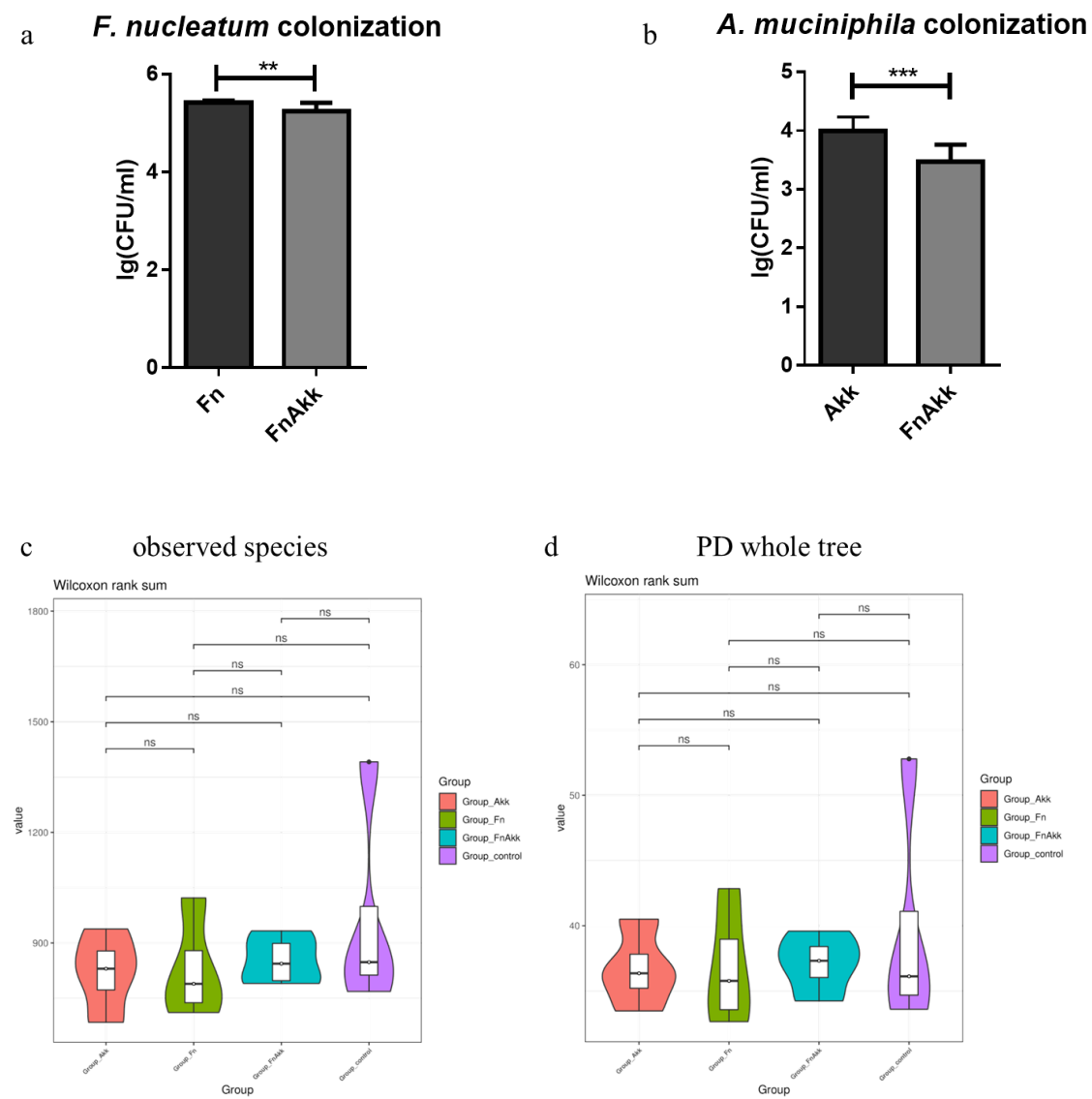


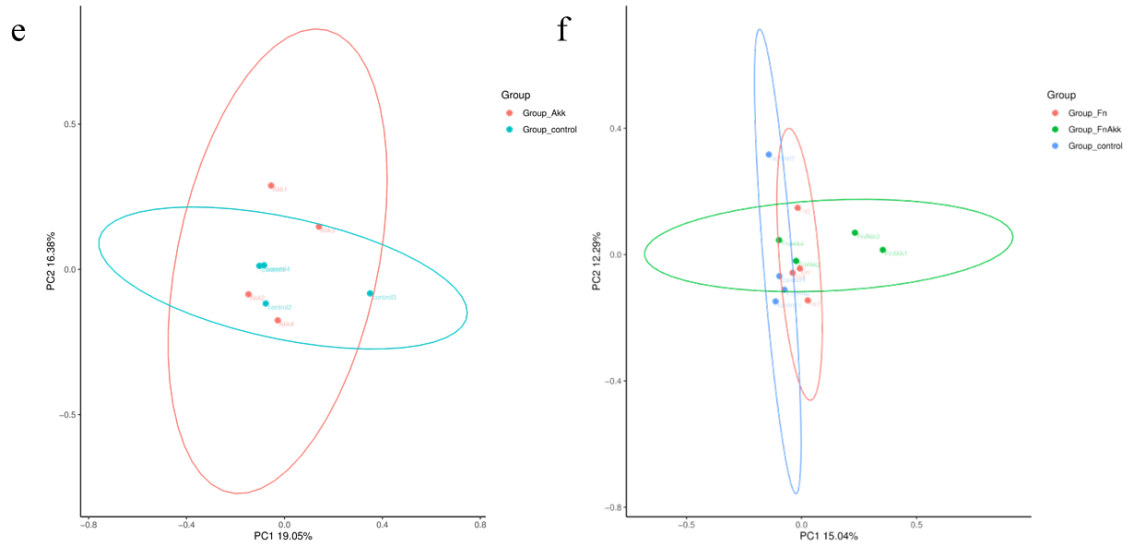
Supplementary figure 1 A. muciniphila inhibits the growth of *F. nucleatum* in a planktonic or biofilm state. a. The amount of *A. muciniphila* in two media. **b.** The amount of *F. nucleatum* in two media. Data are shown as the mean $\pm$ SD.



Supplementary figure 2 A. muciniphila inhibits the inflammatory effect on

gingival epithelial cells caused by *F. nucleatum* via inhibiting expression of TLR/MyD88/NF- κ B pathways and inflammatory factors secretion. **a.** Gene expression of human GECs treated by bacteria for 24h (abscissa and ordinate values are logarithmic: multiple of the difference in gene expression, ordinate: statistical test value of the difference in gene expression, red dot: significantly upregulated gene, green dot: significant downregulation gene, gray dot: non-significantly different gene); **b-c.** KEGG and GO functional enrichment analysis of human GECs treated by bacteria for 24h (abscissa: Rich Factor, ordinate: KEGG and GO term, color represents P_{adjust} , bubble size represents the number of genes in the pathway);





Supplementary figure 3. *A. muciniphila* inhibits *F. nucleatum*-induced periodontitis in BALB/c mice. a-b. Colonization of *F. nucleatum*(a) and *A. muciniphila*(b) in the Fn group and the Fn+AKK group; **c-d.** α diversity analysis of oral plaque samples: observed species(c) and PD whole tree(d); **e-f.** PCoA analysis of oral plaque samples. AKK vs Control (e); Fn +AKK, Fn vs Control (f). Data are shown as the mean $\pm$ SD. Statistical significance was determined by Wilcoxon rank-sum test and Student-Newman-Keuls test. *: $P < 0.05$, **: $P < 0.01$, ***: $P < 0.001$, ns: not significant.