



**Figure S1.** Microbial diversity analysis among different giant panda groups:  
 (a) Species-level  $\alpha$ -diversity statistics, where  $P < 0.05$  indicates statistical significance;  
 (b) PCoA of species-level microbial community composition;  $R^2$  and  $P$  values were calculated using PERMANOVA based on centroids;  
 (c) PCoA generated using HUMAnN functional profiles.