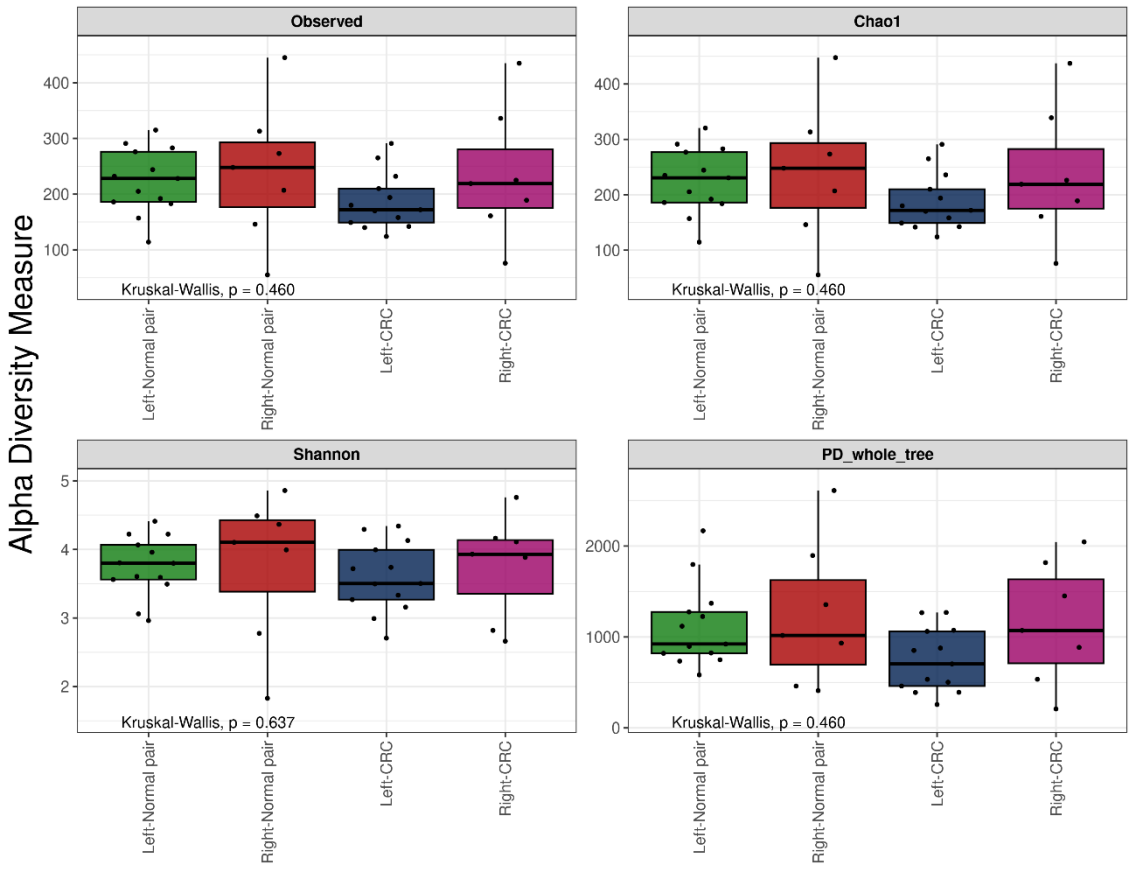


Supplementary Figure 1. The alpha diversity analyses examine the bacterial diversity present in both normal pair tissue and CRC tissue communities. Graphs displaying alpha diversity metrics including observed species, Chao1, Shannon, and phylogenetic diversity (PD) based on the whole tree, with individual samples in each group represented by black dots.



Supplementary Figure 2. Detection of *Fusobacterium* in left-sided and right-sided colorectal cancer tissues using FISH analysis. Representative FISH images comparing *Fusobacterium* colonization between Left-sided (Left-CRC) and Right-sided (Right-CRC) colorectal cancer specimens. Cell nuclei are counterstained with DAPI (blue). *Fusobacterium* probe signals (red arrowheads) demonstrate distinct colonization patterns. Right-CRC exhibits abundant bacterial signals within well-defined glandular structures and crypts of Lieberkühn, while Left-CRC shows sparse bacterial colonization with scattered distribution pattern. Scale bar = 100 μ m.

