

Supplementary figures

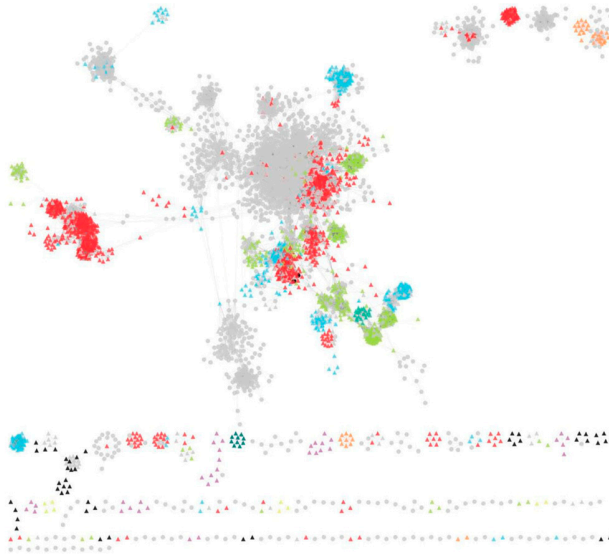


Figure S1. Gene-sharing taxonomic network of viral sequences in this study, including viral RefSeq viruses v85. RefSeq viruses are in triangle shape. Viruses from the *Siphoviridae* family are highlighted in red, *Podoviridae* in cyan, *Myoviridae* in light green, *Microviridae* in orange, *Inoviridae* in purple, *Leviviridae* in yellow, *Fuselloviridae* in dark green, others in black, and unclassified in grey. Each node represents a genome, whereas connecting edges show shared genes between genomes.

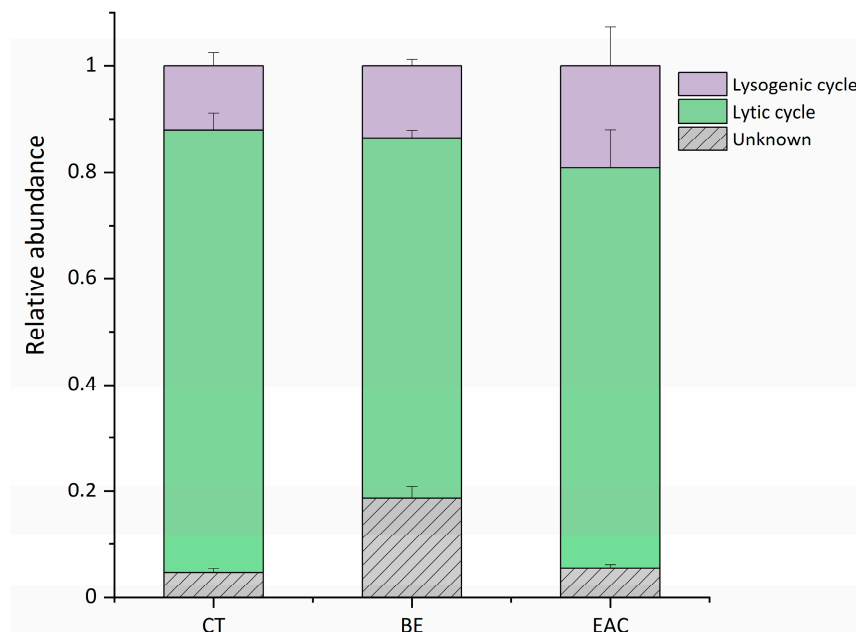


Figure S2. The proportion of lytic/lysogenic replication cycles predicted for the viral contigs from three groups; CT represents stool samples from healthy controls; BE represents stool samples from Barrett Esophagus patients; EAC represents stool samples from Esophageal

Adenocarcinoma patients. Error bars indicate the average \pm SE. Statistical significance was determined by Kruskal-Wallis, Dunn's post hoc test, $p < 0.05$.

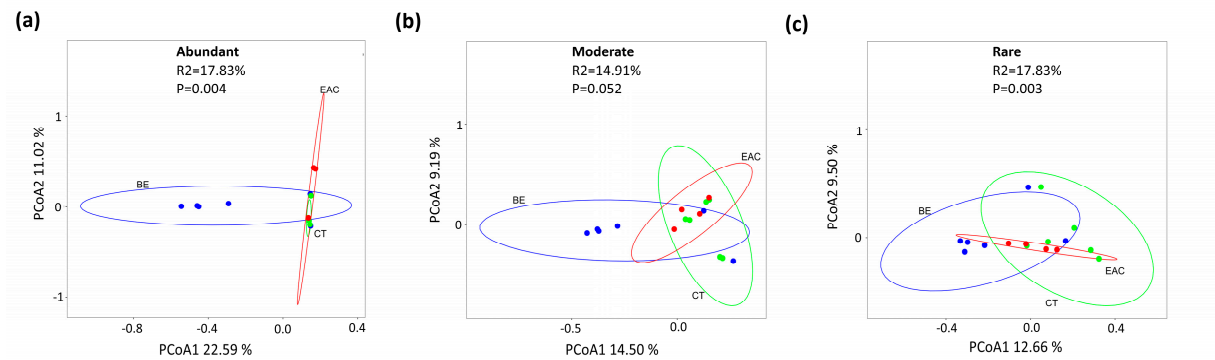


Figure S3. PCoA plot of the viral community composition based on the Bray-Curtis distances in CT, BE, and EAC samples. (a) PCoA plot of the abundant viral community composition (b) PCoA plot of the moderate viral community composition, and (c) PCoA plot of the abundant rare viral community composition. CT represents stool samples from healthy controls; BE represents stool samples from Barrett Esophagus patients; EAC represents stool samples from Esophageal Adenocarcinoma patients. Statistical significance was determined by the PERMANOVA test.

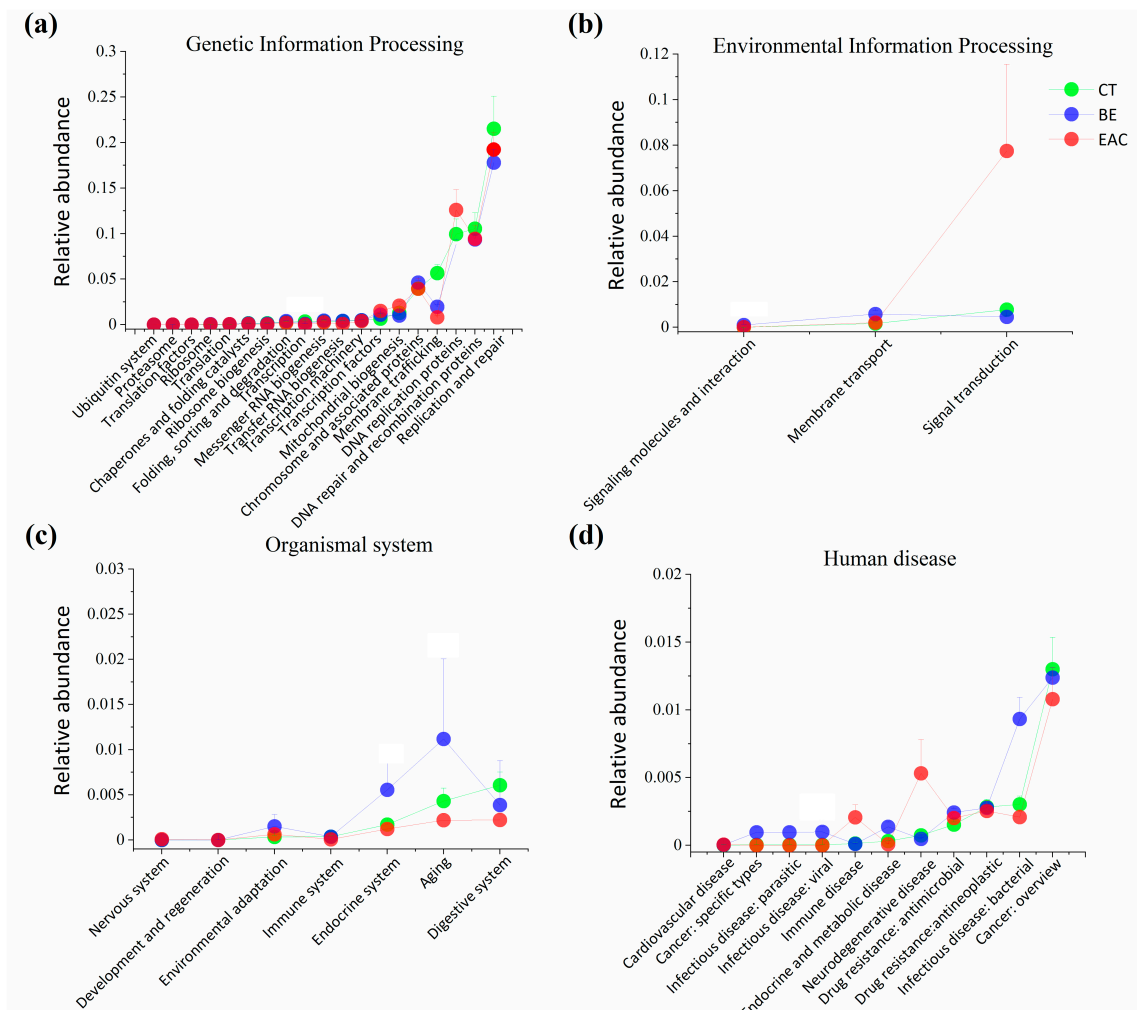


Figure S4. The relative abundance of different functional traits in viral sequences **(a)** The relative abundance of Genetic information processing; **(b)** The relative abundance of Environmental information processing; **(c)** The relative abundance of Organismal system; **(d)** The relative abundance of Human disease. CT represents stool samples from healthy controls; BE represents stool samples from Barrett Esophagus patients; EAC represents stool samples from Esophageal Adenocarcinoma patients. Error bars indicate the average \pm SE. Statistical significance was determined by two-way analysis of variance [ANOVA], Tukey's post hoc test, $p < 0.05$.

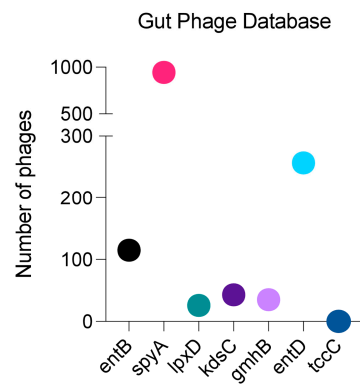


Figure S5. The number of phages that contained the identified AMGs of this study in the Gut Phage Database (GPD).