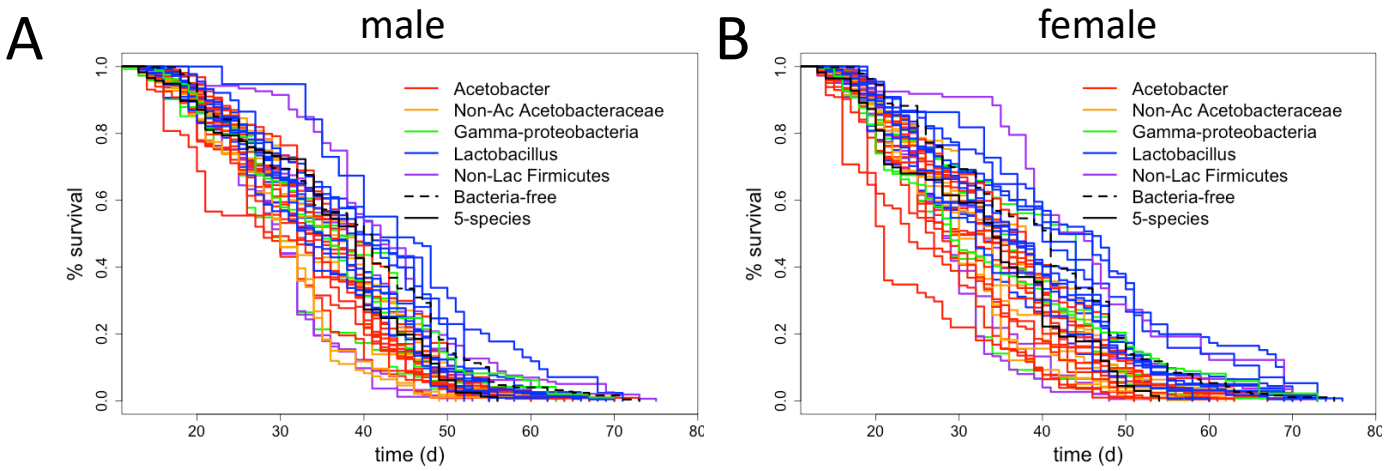

Figure S1. Kaplan-Meier plots for Figure 1. Kaplan—meier plots of lifespan for a) male and (b) female flies that were mono-associated with the different bacteria as summarized in Figure 1.

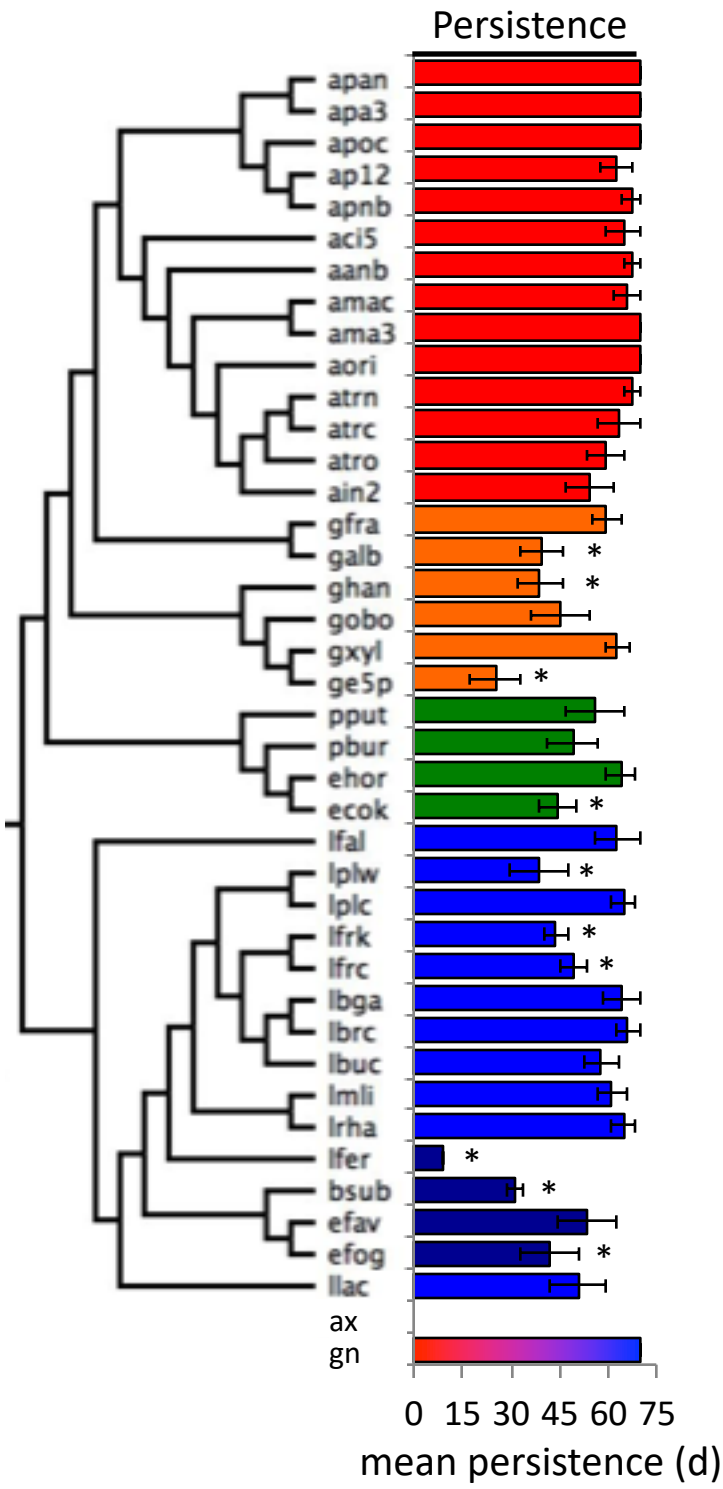

Figure S2. Inferred mean persistence of bacteria in flies throughout the lifespan experiment. Error bars are shown as standard error of the mean. Asterisks indicate significantly different persistence than in flies reared with a 5-species gnotobiotic community ('gn'). Bacteria-free ('ax'). Other 4-character designations are from Table 1.

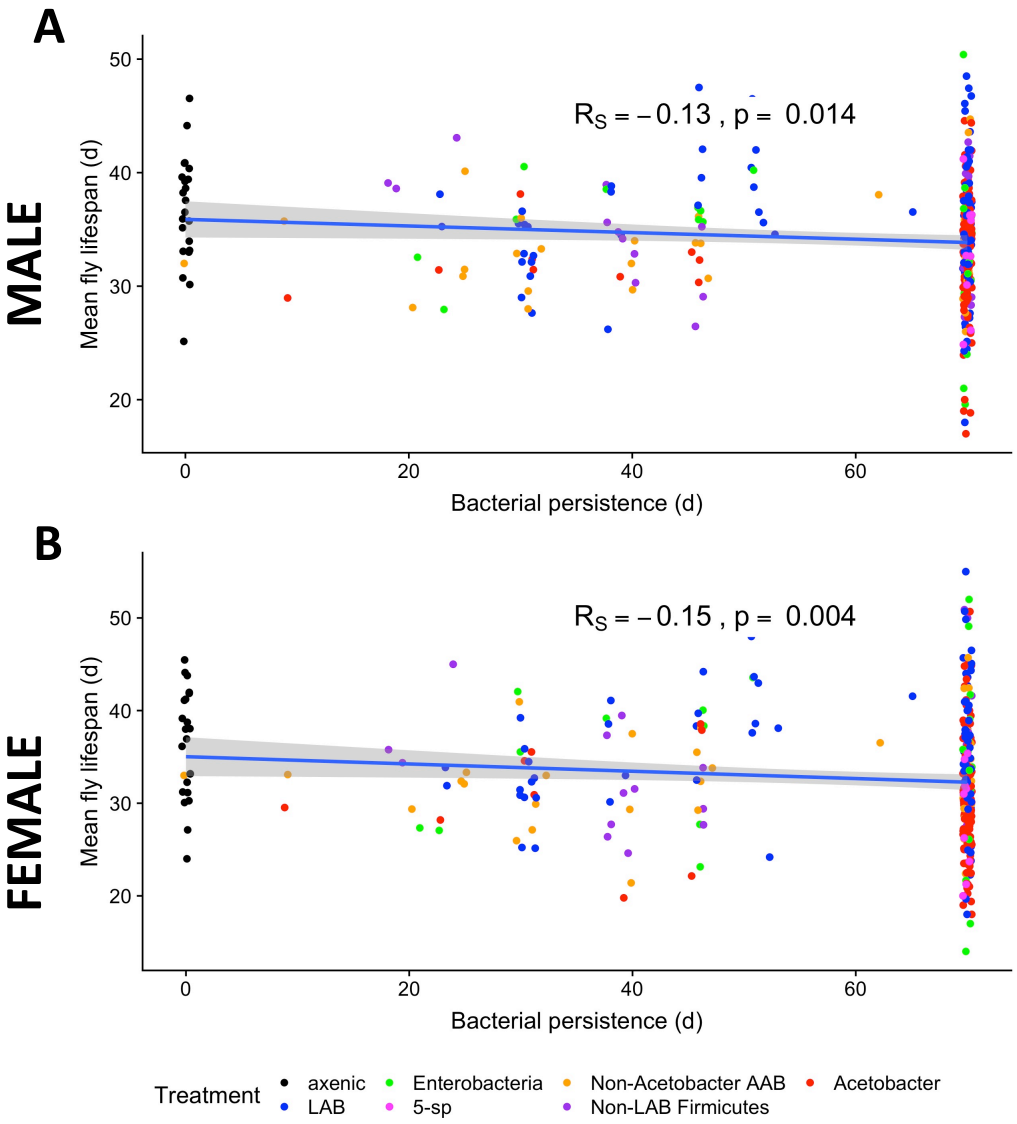

Figure S3. Correlations between bacterial persistence and *D. melanogaster* lifespan are shown in A) male and B) female flies. Individual vials from all replicates of treatments are shown. Bacterial persistence was calculated as the number of days that bacteria could be detected in F1 offspring of the flies being tested for lifespan. Mean lifespan was calculated as the number of days to death of all flies that died. R_s = Spearman's rho; p = p-value.

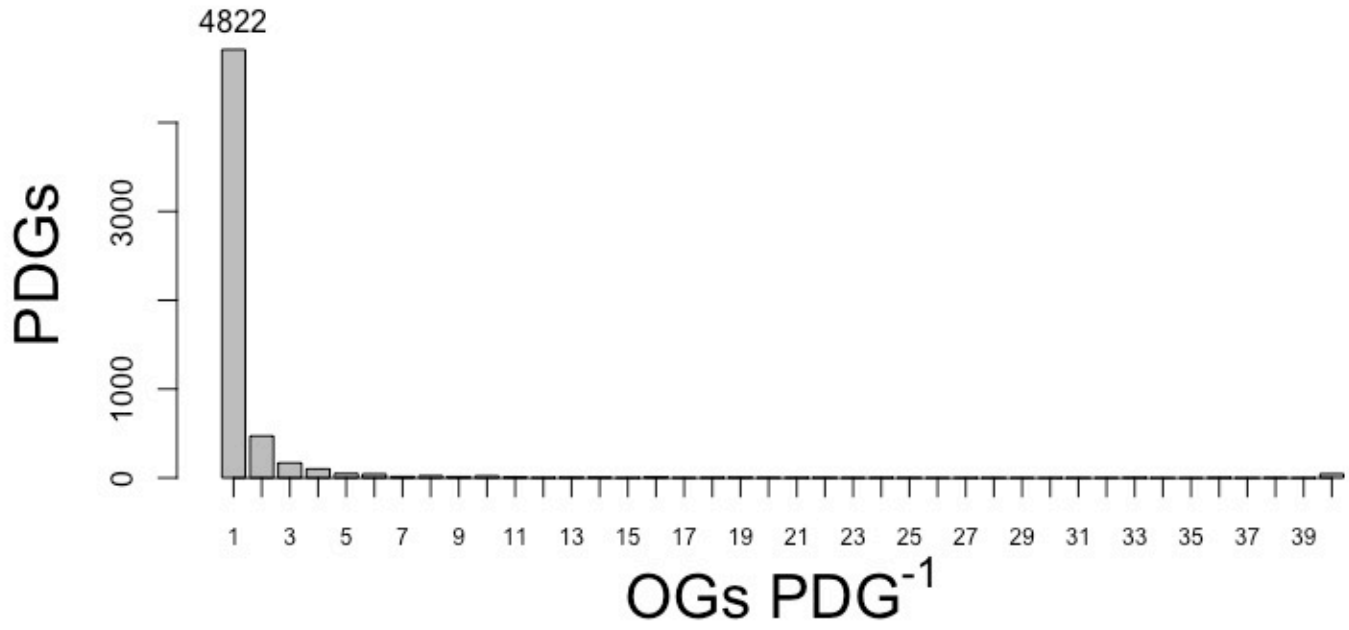

Figure S4. Histogram of orthologous groups (OGs) per phylogenetic distribution group (PDG)

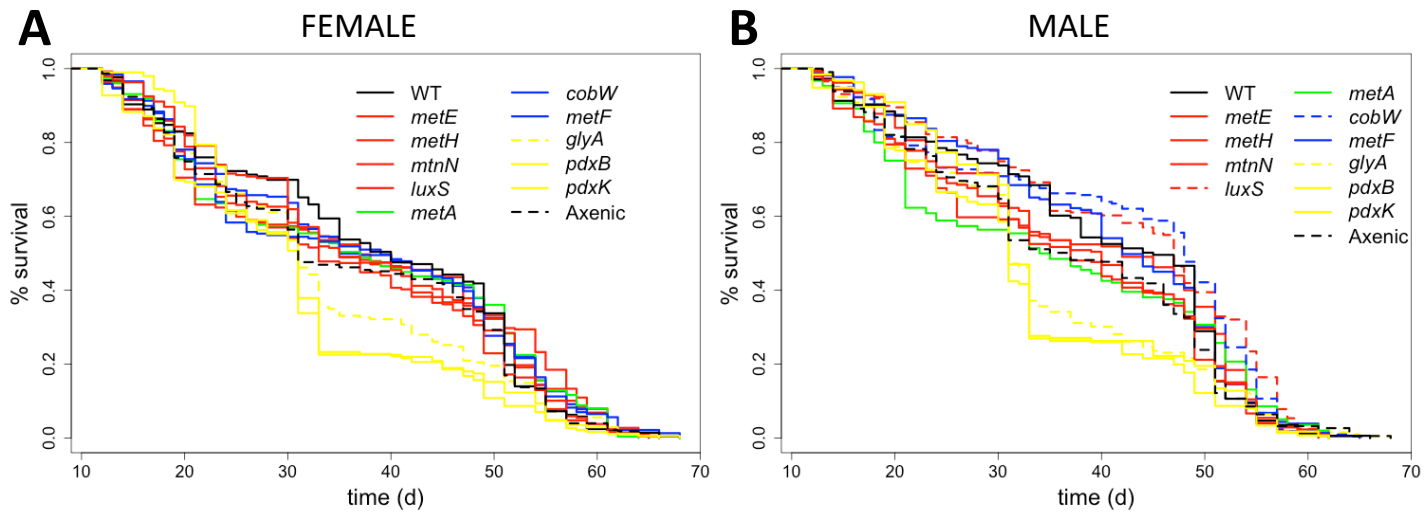

Figure S5. Kaplan-Meier plots of the data shown in Figure 2B-C. A) Female; B) Male flies. Coloring follows the same patterns as in Figure 2. Treatment names are as in Figure 2 except Axenic = Ax.