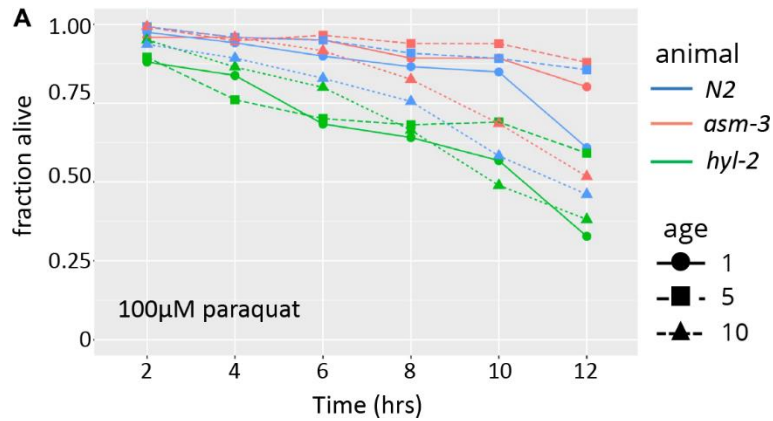
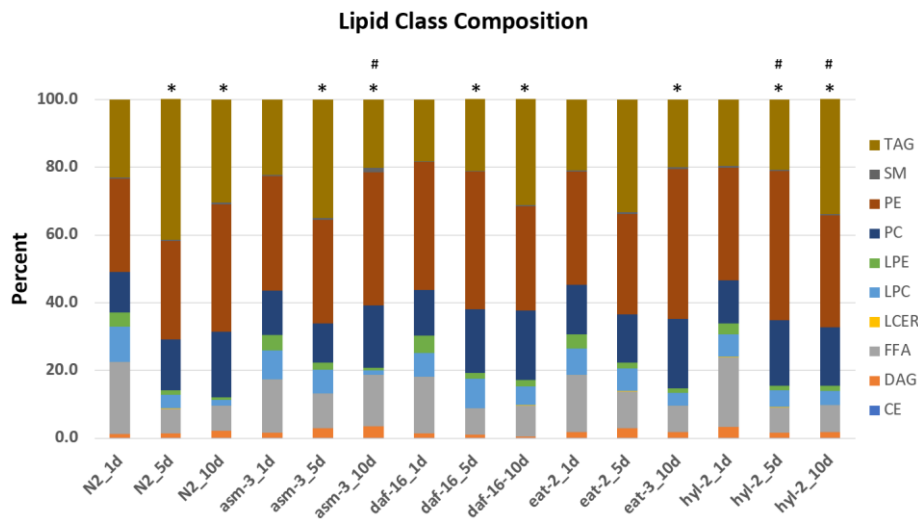


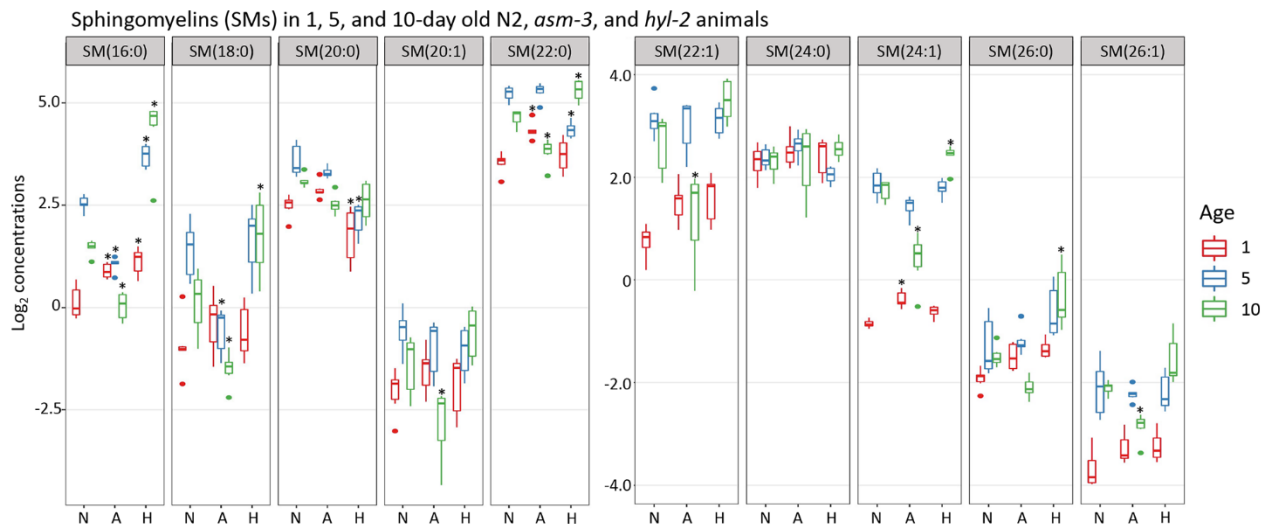
**SUPPLEMENTARY FIGURES**



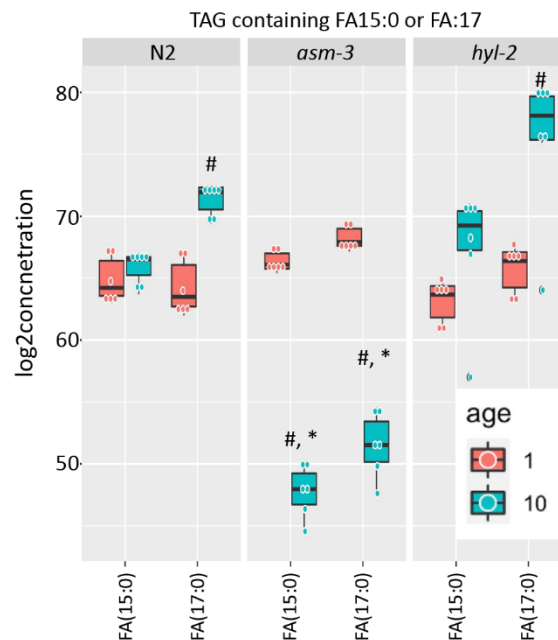
**Supplementary Figure 1. *hyl-2*/ceramide synthase animals show poor response to paraquat.** (A) Survival of 1-, 5-, and 10-day old N2 (blue), *asm-3* (red), and *hyl-2* (green) worms exposed to 100µM paraquat. Worms were treated with paraquat in 96 well plates, and response to agitation was recorded every two hours to determine survival. Each group was done in 6 replicates of 10 worms each.



**Supplementary Figure 2. Lipid class composition changes as animals age.** The percentages were calculated as the proportion of the total lipids (nmol/g of worm tissue (µM)) in each class divided by total lipids in the group. The percentages were then compared to the 1-day N2 animals (\* indicates  $p < 0.05$  compared to N2\_1d). Each 5- and 10- day was also compared to the 1-day group for each strain (# indicates  $p < 0.05$  compared to 1d counterpart). Comparisons were performed using Chi Sq analyses.



**Supplementary Figure 3. Sphingomyelin changes by age in sphingolipid mutants.** The boxplots show log<sub>2</sub> concentrations of respective sphingolipids in N2 (N), *asm-3*/acid sphingomyelinase (A) and *hyl-2*/ceramide synthase (H) animals. For sphingomyelins, the lipid ID does not include the 18:1 fatty acid chain, and LIPIDMAPS nomenclature is reported in Supplementary table 11. For all, n=6 and \* indicates  $p < 0.05$  compared only to N2 animals of the same age (ANOVA and Tukey-HSD tests).



**Supplementary Figure 4. Triacylglycerols containing FA15:0 and FA17:0 are increased in *asm-3*/acid sphingomyelinase mutants.** Total Log<sub>2</sub> concentrations of TAG containing FA(15:0) and FA(17:0) chains were summed for 1- and 10-day old N2, *asm-3*, and *hyl-2* animals (n=6 for each group). When comparing N2 and *asm-3*, there was a significant difference between TAGs containing FA15:0 and FA17:0, and pairwise analyses show significant differences between 10-day concentrations ( $p < 0.000001$  for FA15:0 and  $p < 0.000001$  for FA17:0) but not 1-day concentrations. For comparisons between N2 and *hyl-2*, there was also a significant difference between N2 and *hyl-2* animals, but pairwise analysis did not show significant differences between 10-day concentrations ( $p = 0.93$  for FA15:0 and  $p = 0.11$  for FA17:0). For all, # indicates  $p < 0.05$  compared to 1-day counterpart of the same genotype. \* indicates  $p < 0.05$  compared to N2 counterpart of the same age.