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Supplemental information

Aging is associated

with a modality-specific decline in taste

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SUPPLEMENTARY FIGURES

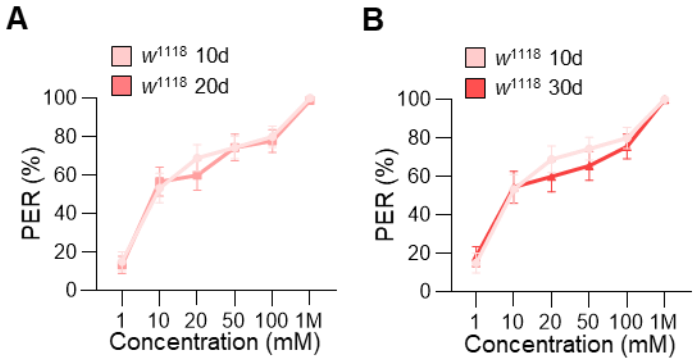

Figure S1. Taste response to sucrose across the lifespan, related to Figure 1. (A) There is no effect on PER to sucrose between 10 day- and 20 day-old w^{1118} flies (two-way ANOVA: $F_{1,328}$ = 0.2469, P = 0.6196; N = 20–30). **(B)** There is no effect on PER to sucrose between 10 day- and 30 day-old w^{1118} flies (two-way ANOVA: $F_{1,333}$ = 0.6482, P = 0.4213; N = 20–30). Error bars indicate ± SEM.

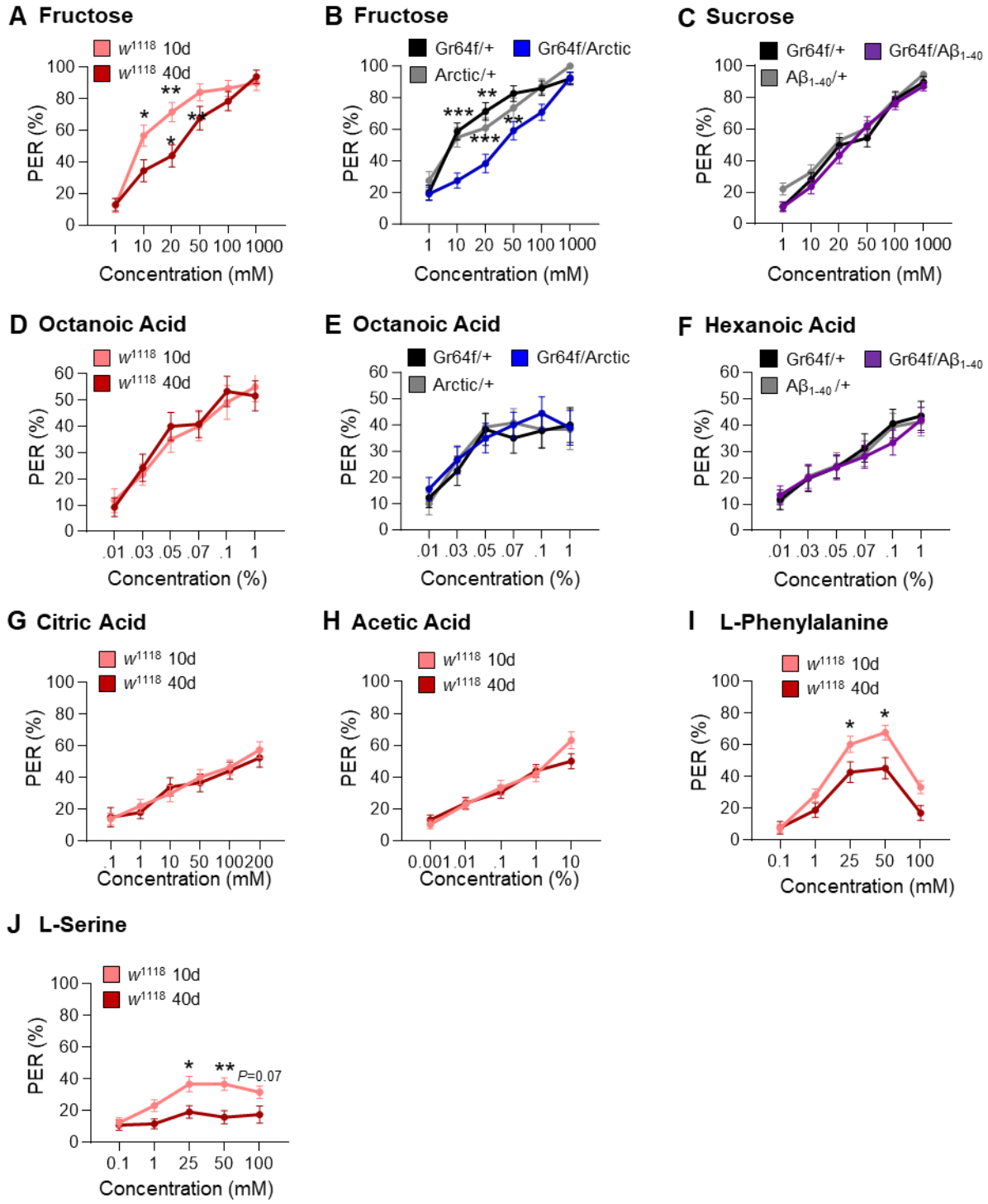

Figure S2. Taste response to additional tastants in aging and AD model flies, related to Figure 1. (A) There is a significant effect of age on PER to fructose in w^{1118} flies (two-way ANOVA: $F_{1,396} = 11.82$, $P < 0.0006$; N = 28–40). **(B)** There is a significant effect of Arctic expression on PER to fructose (two-way ANOVA: $F_{2,726} = 21.54$, $P < 0.0001$; N = 34–50). **(C)** There is no effect of $A\beta_{1\text{-}40}$ expression on PER to sucrose (two-way ANOVA: $F_{2,858} = 2.779$, $P < 0.1232$; N = 47–50). **(D)** There is no effect of age on PER to octanoic acid in w^{1118} flies (two-way ANOVA: $F_{1,468}$ =

0.1367, $P < 0.7117$; N = 40). **(E)** There is no effect of Arctic expression on PER to octanoic acid (two-way ANOVA: $F_{2,582} = 0.2824$, $P < 0.7541$; N = 20–40). **(F)** There is no effect of $A\beta_{1\text{-}40}$ expression on PER to hexanoic acid (two-way ANOVA: $F_{2,800} = 0.1829$, $P < 0.8329$; N = 37–50). **(G)** There is no effect of age on PER to citric acid in w^{1118} flies (two-way ANOVA: $F_{1,492} = 0.2888$, $P = 0.5912$; N = 20–40). **(H)** There is no effect of age on PER to acetic acid in w^{1118} flies (two-way ANOVA: $F_{1,375} = 0.6464$, $P = 0.4219$; N = 38–39). **(I)** There is a significant effect of age on PER to L-Phenylalanine in w^{1118} flies (two-way ANOVA: $F_{1,480} = 19.13$, $P < 0.0001$; N = 39–59). **(J)** There is a significant effect of age on PER to L-Serine in w^{1118} flies (two-way ANOVA: $F_{1,485} = 25.54$, $P < 0.0001$; N = 40–59). Error bars indicate ± SEM. * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

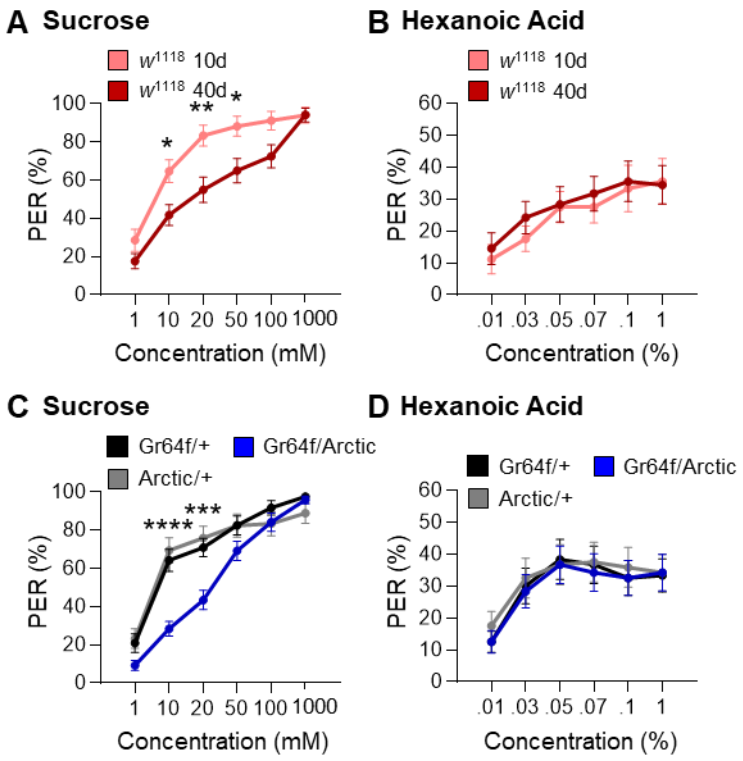

Figure S3. Taste response to sugar, but not fatty acids, is reduced at intermediate concentrations of sucrose and hexanoic acid in aging and AD model male flies, related to Figure 1. (A) There is a significant effect of age on PER to sucrose in w^{1118} flies (two-way ANOVA: $F_{1,472} = 30.77$, $P < 0.0001$; N = 34–40). **(B)** There is no effect of age on PER to hexanoic acid in w^{1118} flies (two-way ANOVA: $F_{1,408} = 0.6961$, $P < 0.4046$; N = 30–40). **(C)** There is a significant effect of Arctic expression on PER to sucrose (two-way ANOVA: $F_{2,678} = 21.98$, $P < 0.0001$; N = 36–40). **(D)** There is no effect of Arctic expression on PER to hexanoic acid (two-way ANOVA: $F_{2,700} = 0.3514$, $P < 0.7039$; N = 38–40). Error bars indicate ± SEM. * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$; **** $P < 0.0001$.

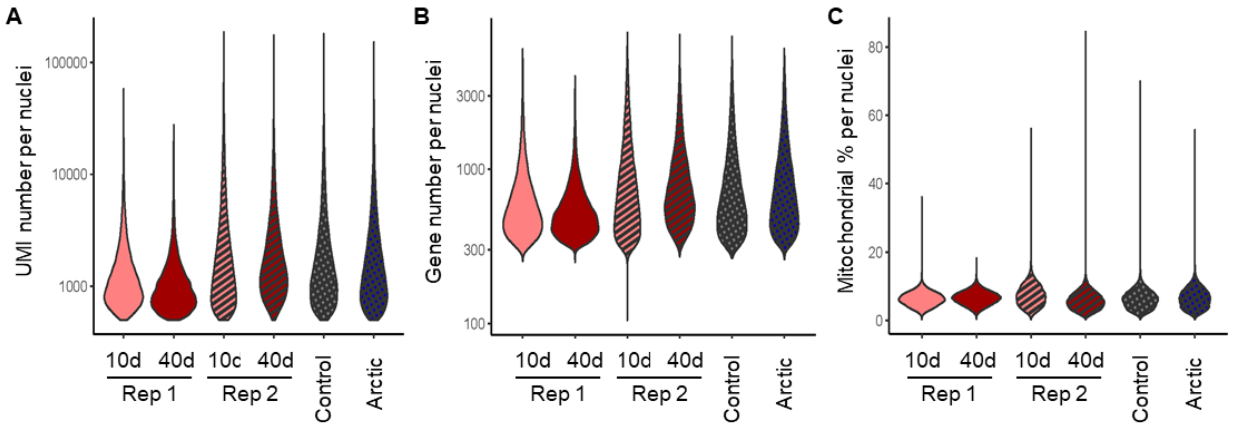

Figure S4. Quality assessment of snRNA-seq results, related to Figure 4. The **(A)** total number of Unique Molecular Identifiers (UMI), **(B)** number of expressed genes, and **(C)** percentage of mitochondrial transcripts are shown for each replicate (rep).

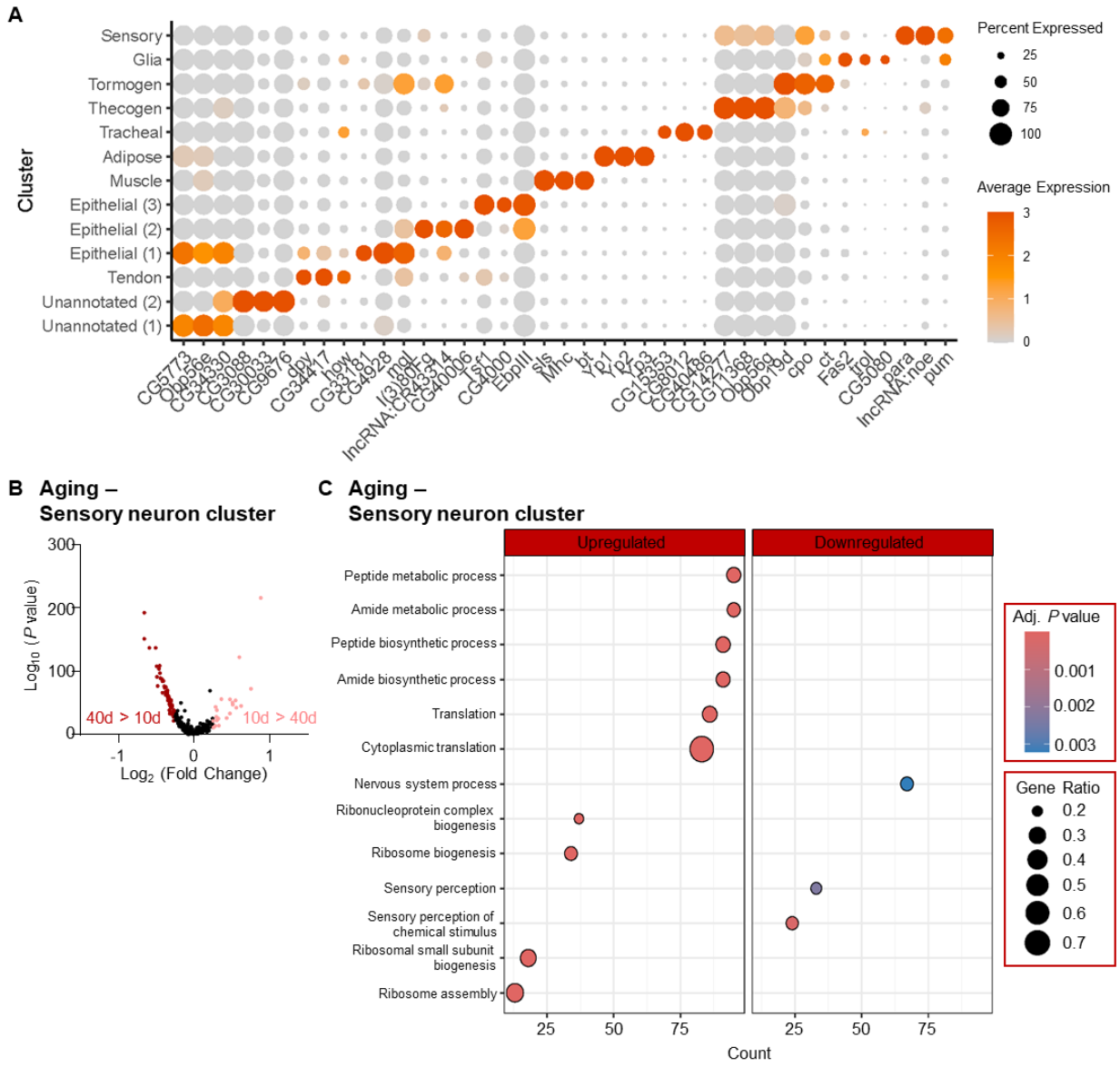

Figure S5. snRNA-seq clustering and differential gene expression analysis, related to Figure 4. (A) Dot plot of the top 3 marker genes in each cluster based on log fold-change in expression. **(B)** Volcano plot depicting differentially expressed genes within the sensory cluster between 10- and 40-day-old flies. **(C)** Gene Ontology (GO) analysis of the differentially expressed genes identified in **(C)**.

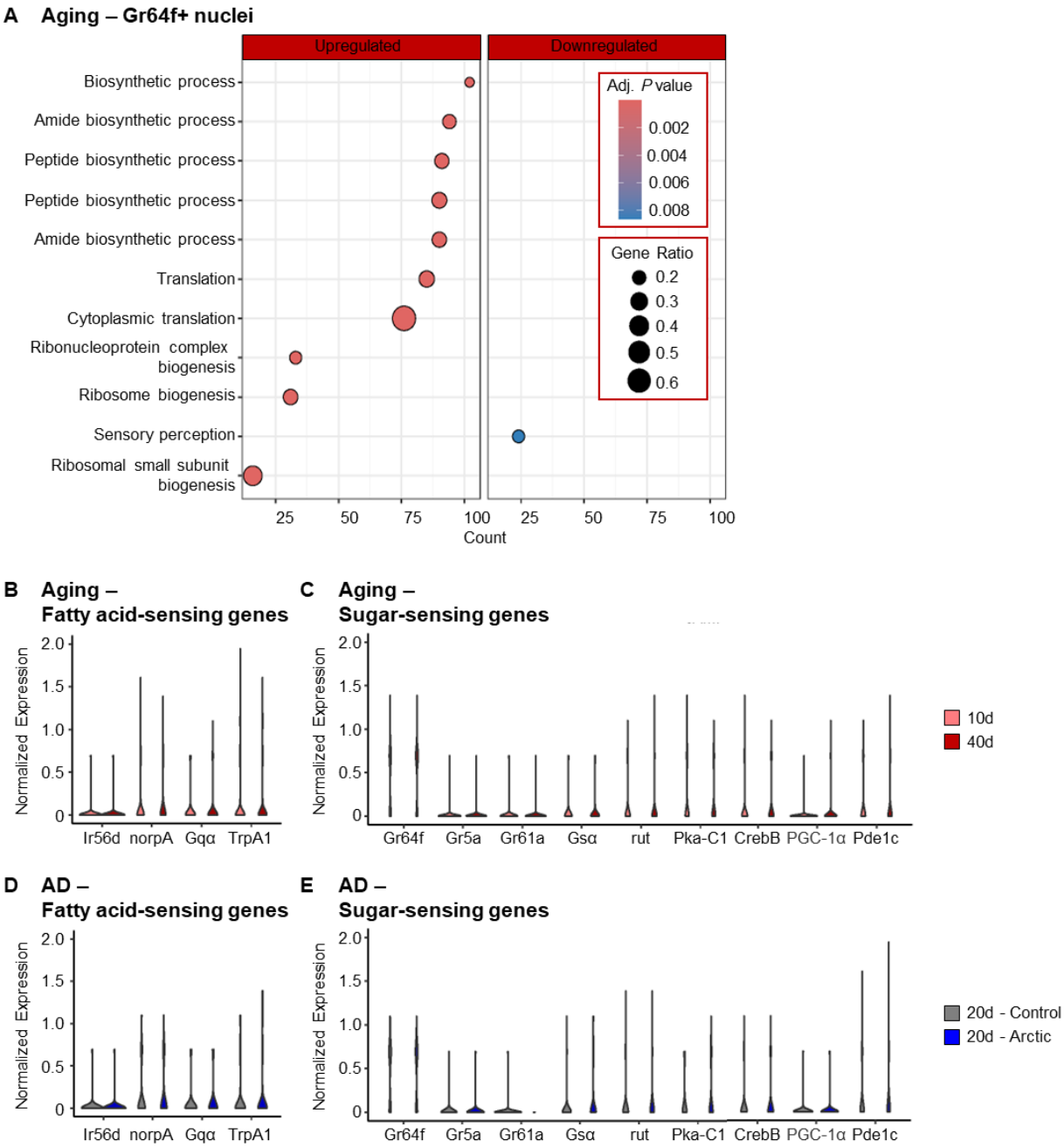

Figure S6. *Gr64f+* gene ontology and differential expression analysis in aging and AD model flies, related to Figure 4. (A) Gene Ontology (GO) analysis of the differentially expressed genes identified in *Gr64f+* 10- and 40 day-old flies. **(B, C)** Gene expression of candidate genes associated with the **(B)** *Phospholipase C* signaling and **(C)** cAMP signaling pathways between the 10- and 40-day-old groups. There were no significant differences in gene expression. **(D, E)** Gene expression of candidate genes associated with the **(D)** *Phospholipase C* signaling and **(E)** cAMP signaling pathways between the Control and *Arctic*-expressing groups. There were no significant differences in gene expression.