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SUPPLEMENTARY FIGURES

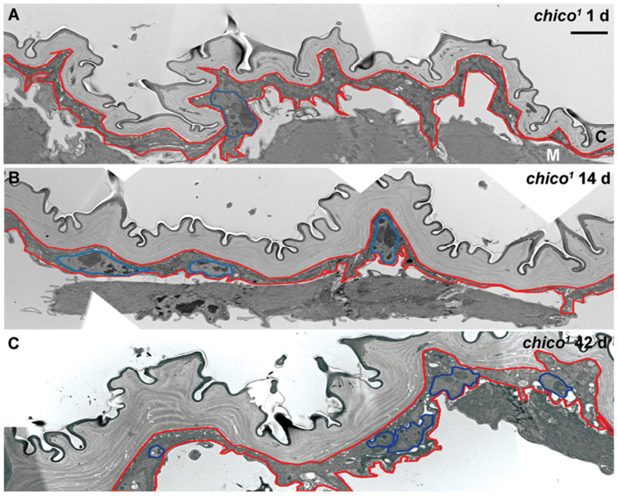

Figure S1. TEM Analysis Reveals Differential Morphology Changes in the Ventral Abdominal Epidermis of *chico^1* Mutants. TEM of transverse sections of ventro-lateral abdominal epidermis of: **A,** *chico^1* 1 d. **B,** *chico^1* 14 d. **C,** *chico^1* 42 d. Comparison of 14 d old *chico^1* samples (B) with age-matched controls (Figure 2C) shows that epidermal thickness is preserved. Red, epidermal boundaries. Blue, epidermal nuclei. c, cuticle; m, muscle. Bars, 2 µm.

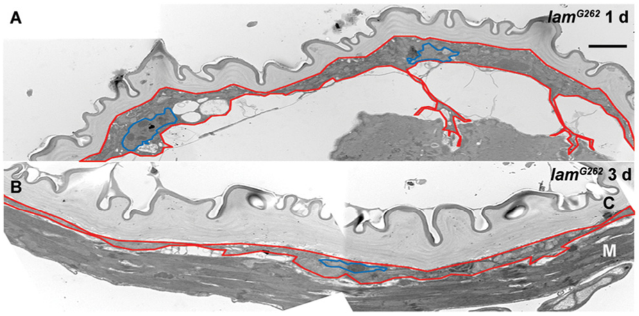

Figure S2. TEM Analysis Reveals Differential Morphology Changes in the Ventral Abdominal Epidermis of *lam^{G262}* Mutants. TEM of transverse sections of ventro-lateral abdominal epidermis of: **A,** *lam^{G262}* 1 d. **B,** *lam^{G262}* 3 d. Note the strongly condensed nuclei in 3 d old *lam^{G262}* mutants. Red, epidermal boundaries. Blue, epidermal nuclei. c, cuticle; m, muscle. Bars, 2 µm.

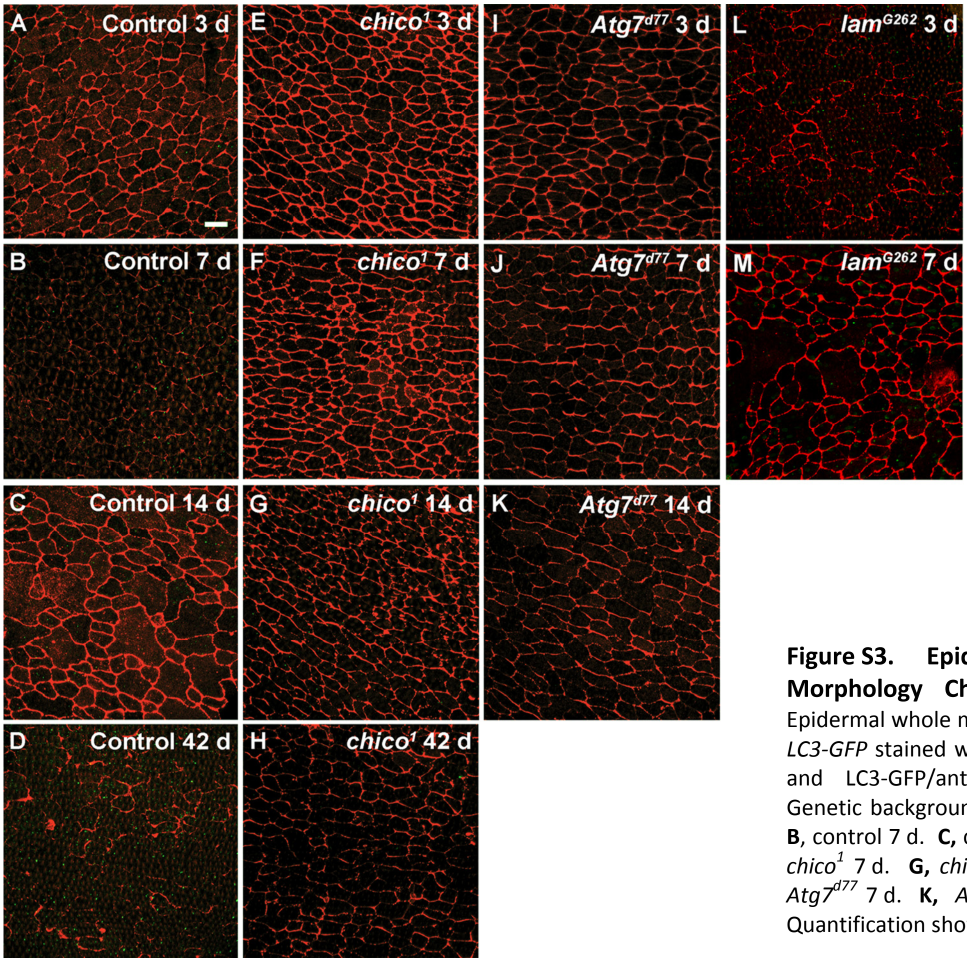

Figure S3. Epidermal Autophagy Correlates with Morphology Changes in the Aging Epidermis. A-L, Epidermal whole mounts of flies bearing *NP2108-GAL4* and *UAS-LC3-GFP* stained with anti-Fasciclin III (red) to label membranes and LC3-GFP/anti-GFP (green) to label autophagosomes. Genetic backgrounds as indicated. Bar, 20 µm. **A**, control 3 d. **B**, control 7 d. **C,** control 14 d. **D,** control 42 d. **E,** *chico*^{1} 3 d. **F,** *chico*^{1} 7 d. **G,** *chico*^{1} 14 d. **H,** *chico*^{1} 42 d. **I,** *Atg7*^{d77} 3 d. **J,** *Atg7*^{d77} 7 d. **K,** *Atg7*^{d77} 14 d. **L,** *lam*^{G262} 3 d. M, *lam*^{G262} 7 d. Quantification shown in Figure 5C.

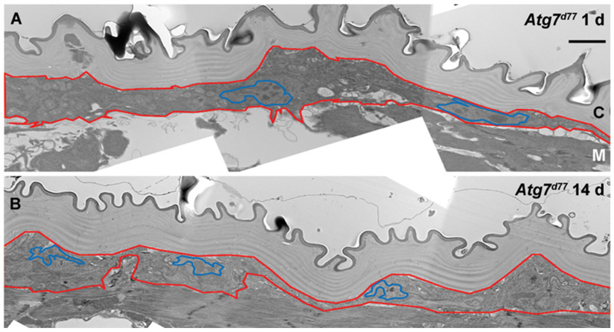

Figure S4. TEM Analysis Reveals Differential Morphology Changes in the Ventral Abdominal Epidermis of *Atg7*^{d77} Mutants. TEM of transverse sections of ventro-lateral abdominal epidermis of: **A,** *Atg7*^{d77} 1 d. **B,** *Atg7*^{d77} 14 d. Comparison of 14 d old *Atg7*^{d77} samples (B) with age-matched controls (Figure 2C) shows that epidermal thickness is preserved. Red, epidermal boundaries. Blue, epidermal nuclei. c, cuticle; m, muscle. Bars, 2 µm.

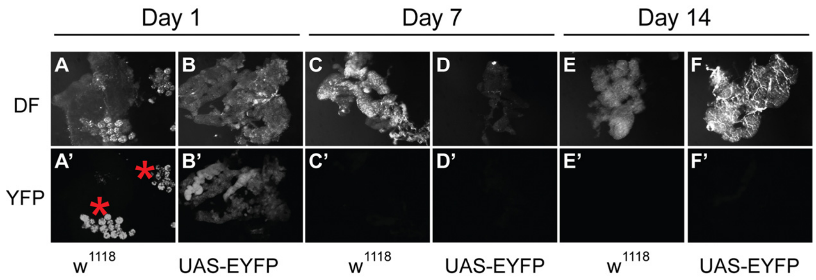

Figure S5. *NP2108-GAL4* expression does not persist in adult fat body. Fat body wholemounts from adult abdomens of the *NP2108-GAL4* driver that was crossed to either control *w*^{1118} animals (A, A', C, C', E, E') or *UAS-2x eYFP* (B, B', D, D', F, F'). Fat body was dissected from animals on days 1 (A,A', B, B'), 7 (C, C', D, D') or 14 (E, E', F, F') and imaged with dark field microscopy (DF; A-F) or fluorescence microscopy to detect eYFP (YFP; A'-F'). Note autofluorescence of lipids on day 1 (asterisks in A').