**Supplementary Figure Legends**

**Figure S1. Expression of *GeneSwitch GAL4* in the ovariole of lines #1774, #2261, and #2305. (A-F)** Ovarioles of one-week (W)-old *GeneSwitch GAL4 #1774>gfp* (A, B), *#2305>gfp* (C, D), *#2261>gfp* flies(E, F) without RU486 (A, C, and E) and with RU486 (10 µg/ml) feeding for two days (B, D and F). Ovarioles are labeled with 1B1 (red; fusomes), LamC (red; terminal filament [TF] and cap cell nuclear envelopes), and GFP (gray). #1774 and #2305 drivers are expressed in follicle cells of mid-stage egg chambers; #2261 is expressed in the germline and polar cells (arrows). Scale bar is 10 µm.

**Figure S2. Effects of RU486 on egg production.** Egg number per female per day is shown for flies fed with 0, 0.36, 3.6 and 7.2 mM RU486 for 5 days. Error bars, standard deviation. \*, *P*<0.05.

**Figure S3. Expression of *GeneSwitch GAL4* is decreased in aged niches of #1774 and #2112, and is leaky in aged escort cells of #2126. (A-R)** One-(A, D, G, J, M and P), 5- (B, E, H, K, N and Q) and 8-week (W)-old (C, F, I, L, O and R) *GeneSwitch GAL4 #1774>gfp* (A-F), *#2112>gfp* (G-L), and *#2126>gfp* germaria (M-R) without RU486 (A-C, G-I, and M-O) or with RU486 (3.6 mM) feeding for two days before dissection (D-F, J-L, and P-R). Germaria are labeled with 1B1 (red; fusomes), Lam C (red; terminal filament [TF] and cap cell nuclear envelopes) and GFP (green). Inserts only show the GFP channel of cap cell (A-L) or escort-cell regions (M-R) (gray). White dashed lines encircle GSCs; yellow lines indicate the junction between GSCs and cap cells, and brackets indicate TFs. Scale bar, 10 µm.

**Figure S4. Induction of Dilp2 expression by *GeneSwitch GAL4* #2261 in the aged niche delays GSC loss. (A-D)** 5-(A and B) and 8-week (W)-old (C and D) *GeneSwitch GAL4 #2261>dilp2* germaria of flies without RU486 (A and C) or with RU486 (3.6 mM) (B and D) for five days before dissection. Germaria are labeled with 1B1 (red; fusomes), Lam C (red; terminal filament [TF] and cap cell nuclear envelopes) and Vasa (green; germ cells). White dashed lines encircle GSCs; yellow lines indicate the junction between GSCs and cap cells. Scale bar, 10 µm. **(E)** GSC numbers in #*2261>dilp2* at 1, 5, and 8 weeks after eclosion. #*2261>dilp2* flies were fed without or with RU486 for five days before dissection. The left Y-axis shows percentage (%) of germaria carrying 0, 1, 2, 3 or more than 3 GSCs, and the right Y-axis shows average (avg.) number of GSCs per germarium. Number of germaria analyzed are shown above each bar. \*, *P*<0.05; \*\*, *P*<0.01; \*\*\*, *P*<0.001. Error bars are SEM. Data were analyzed by Student’s *t*-test according to average number of GSCs per germarium.

**Figure S5. Overexpression of Dilp2 in aged ovaries causes abnormal ovarian morphology. (A-F)** 5- (A, C, E) and 8-week (W)-old (B, D, F) *GeneSwitch GAL4 #2261/+* ovarioles of flies without RU486 feeding (A and B), and *#2261>dilp2* flies fed with RU486 for two (C and D) or five days (E and F) before dissection. Overexpressing *dilp2* in the 8-week-old niche for two or five days causes egg chambers to occur side-by-side in the ovariole (asterisks); meanwhile, overexpressing *dilp2* in 5-week-old niche results in abnormal ovariole morphology, possibly due to stronger GAL4 activity compared to that in 8-week-old niche. Asterisks mark egg chambers placed side-by-side in the ovariole. Ovarioles were stained with 1B1 (red; fusomes), Lam C (red; terminal filament and cap cell nuclear envelopes) and Vasa (green; germ cells). Scale bar, 10 µm.