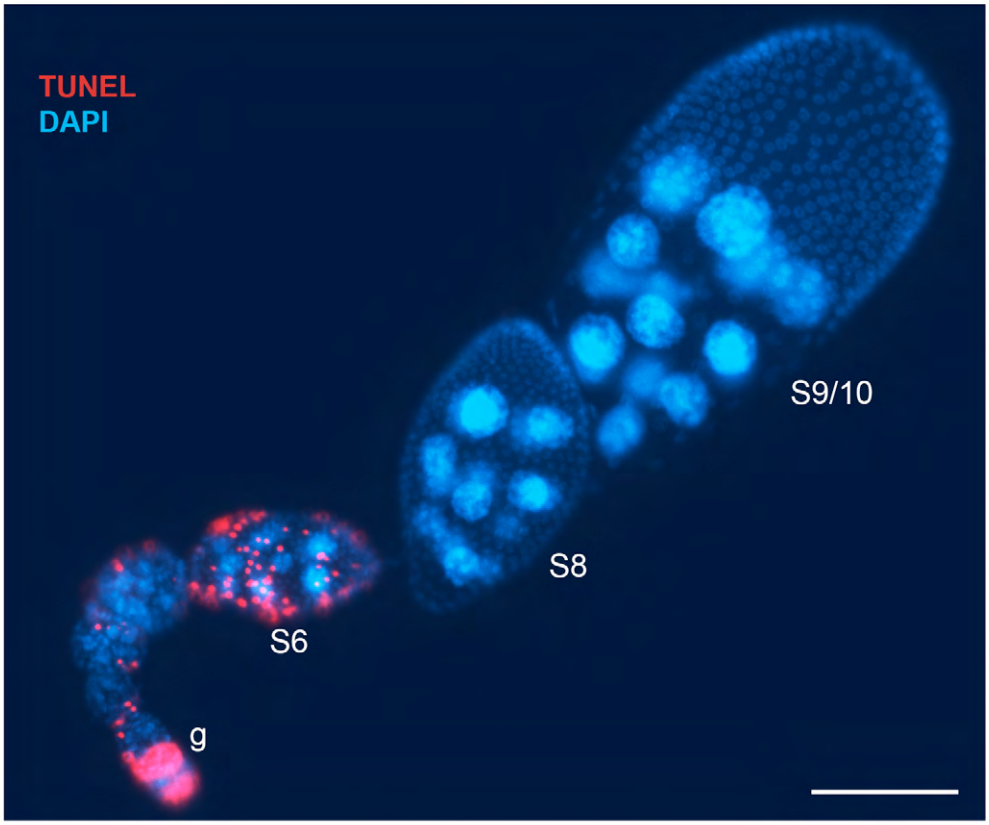

Fig. S1. TUNEL labeling of a D. melanogaster ovariole six hours after IR. Scale bar is 50 microns.

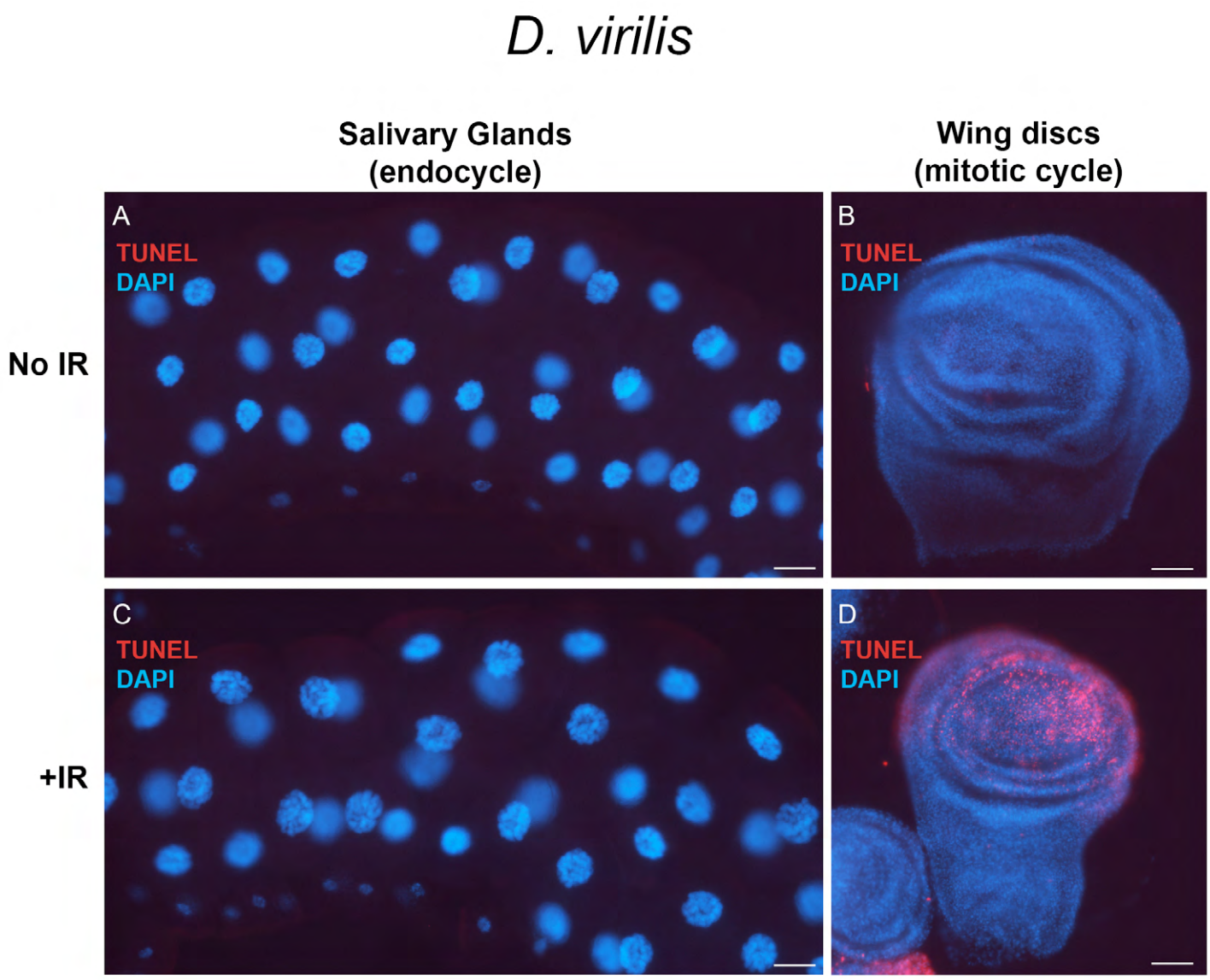

Fig. S2. The repression of apoptosis in endocycling larval tissues is conserved in the genus *Drosophila.* TUNEL labeling of endocycling salivary gland cells (A, C) and mitotic cycling wing disc cells (B, D) from *D. virilis* without (A, B) or with (C, D) ionizing radiation (IR). Scale bars are 50 microns.

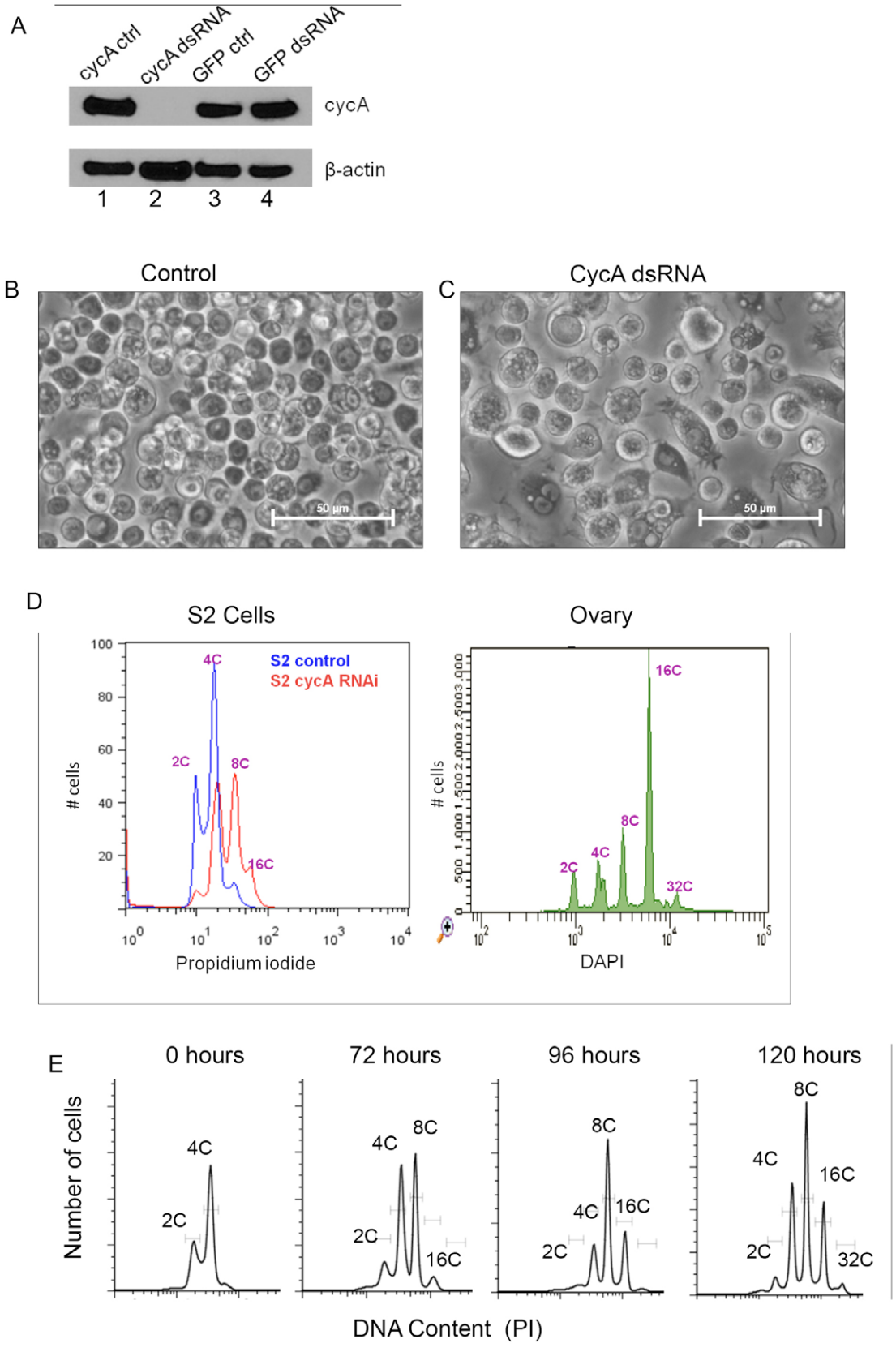

Fig. S3. *Cyclin A* knockdown in *Drosophila* tissue culture cells induces endocycles. (A) Cyclin A protein is not detectable by Western blot 72 hours after treatment of S2 cells with Cyclin A double-stranded RNA (dsRNA) (lane 2). Controls cells were either mock treated (lanes 1, 3) or treated with dsRNA against GFP (lane 4). β-actin was used as a loading control. (B-C) 72 hours after treatment, control cells continue mitotic proliferation (B), while cells treated with CycA dsRNA ceased proliferating, had no evidence of mitosis, and increased in cell and nuclear size (C). (D) Flow cytometry analysis of S2 cell nuclei 72 hours after treatment with CycA dsRNA (red) revealed that they were polyploid with quantum doublings of diploid genome content. Control S2 cells at 72 hours (blue). The profile of genome doublings in S2 cells resembles that of endocycling follicle cells from the ovary (right panel, green). (E) Time course of S2 cell polyploidization at different times after a single CycA dsRNA treatment.

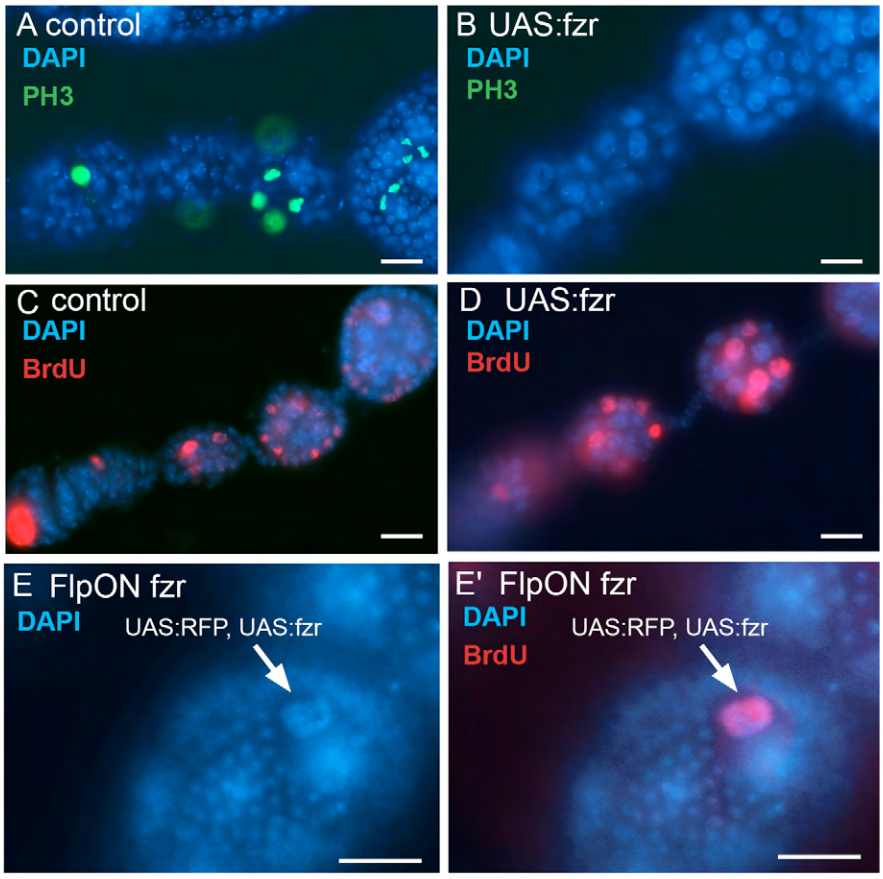

Fig. S4. Overexpression of *fzr* induces precocious endocycles in follicle cells. (A, B) Anti-PH3 and DAPI labeling in control (A) or *hsp70:GAL4 ; UAS:fzr* ovaries after five heat treatments (B). (C, D) BrdU labeling in control (C) or *hsp70:GAL4 ; UAS:fzr* ovaries after five heat treatments (D). (E, E') FLP-On follicle cell clone expressing RFP and fzr. Scale bars are 15 microns.

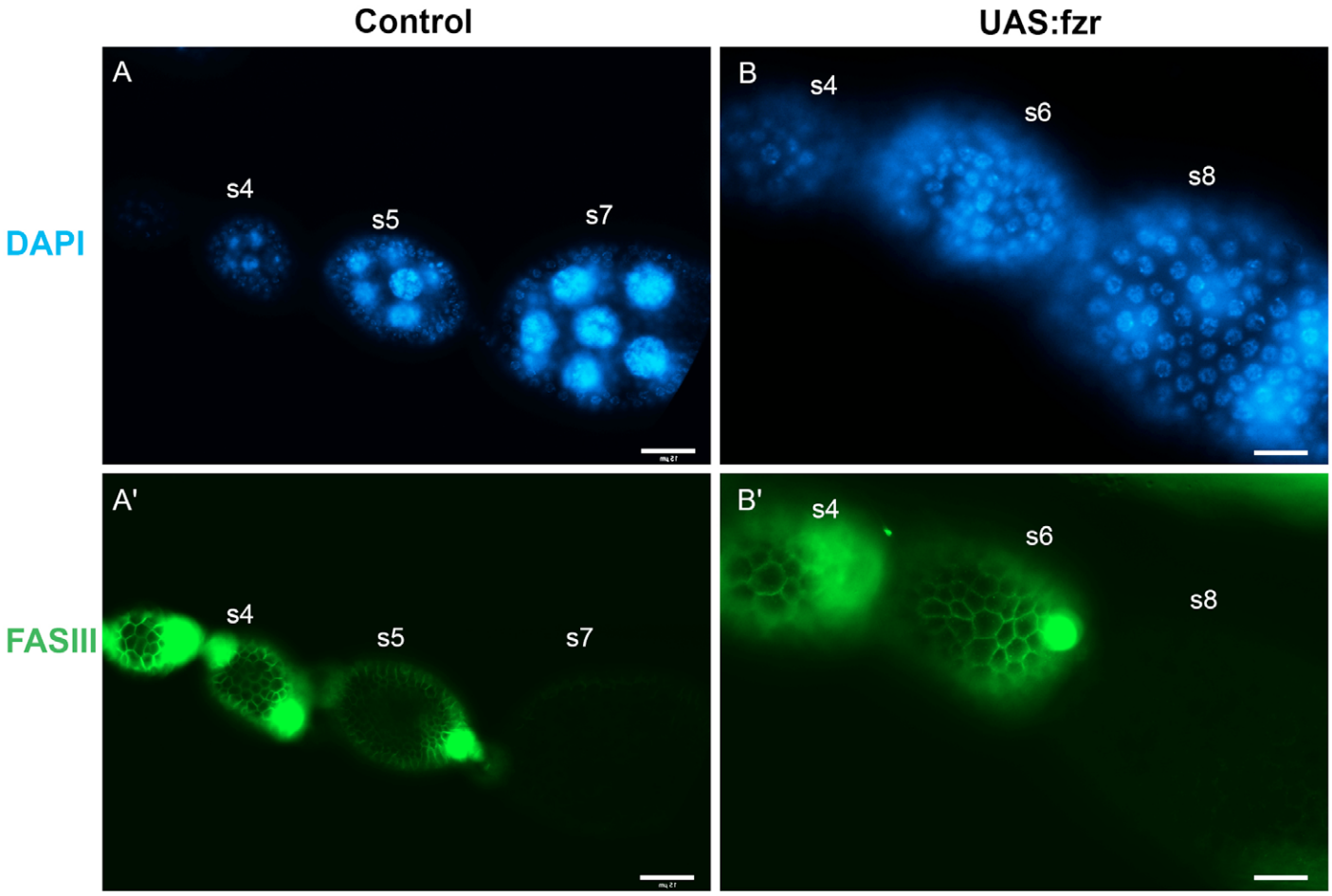

Fig. S5. *fzr* induces precocious endocycles but does not alter the developmental timing of follicle cell differentiation. DAPI (A, B) and anti-FASIII (A', B') labeling of ovarioles from control (A, A') and *hsp70:GAL4 ; UAS:fzr* after five heat treatments (B, B'). Scale bar is 15 microns.

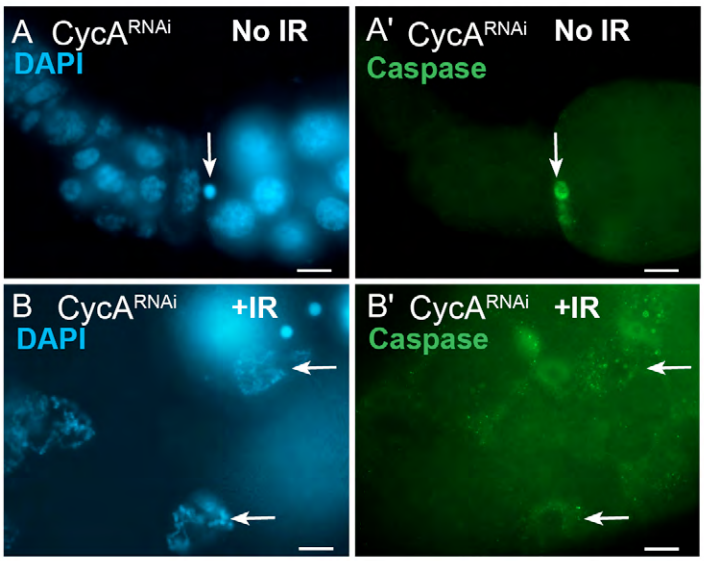

Fig. S6. Apoptosis of iECs recovering from CycA RNAi
After five days of recovery from *CycA*^{RNAi} expression ovaries were labeled with DAPI (A, B) or anti-cleaved Caspase antibodies (A', B'), either without (A, A') or with (B, B') irradiation. Arrows in A, A' point to a rare Caspase 3-positive follicle cell with a large pycnotic nucleus that is undergoing spontaneous apoptosis. Arrows in B, B' point to two polytene follicle cells that labeled faintly with anti-cleaved Caspase 3 24 hours after irradiation, but did not have other hallmarks of apoptosis. All scale bars are 15 microns.