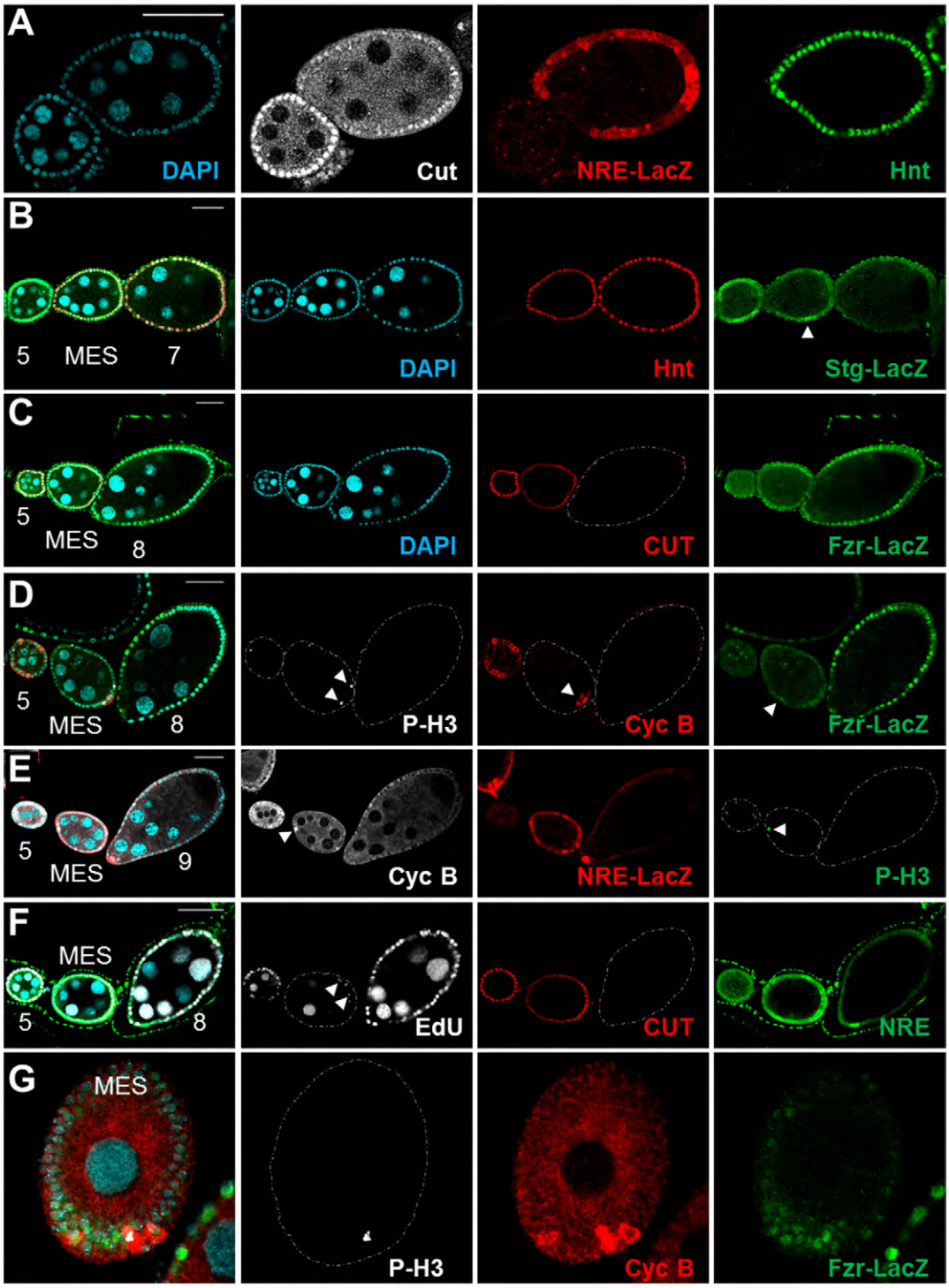
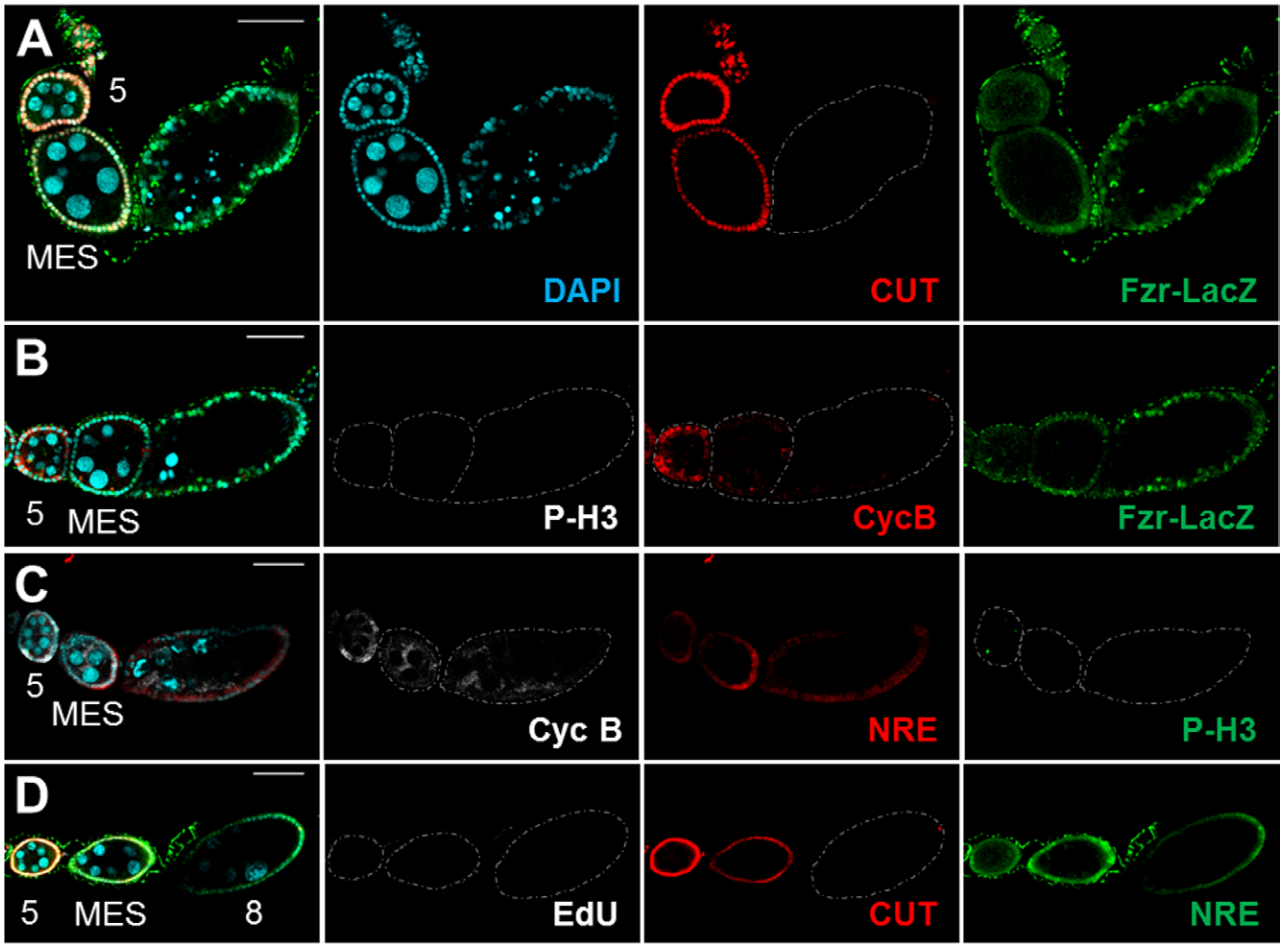


Fig. S1: Expression of mitotic and endocycle markers in MES cells.
All egg chambers are from normally fed flies. **A**) MES egg chambers show overlapping expression of the N activity reporter line NRE-LacZ (red) and of Hnt (green) and Cut (grey). DAPI (cyan). **B**) The arrowhead indicates Stg-LacZ expression in the MES egg chamber. DAPI (cyan), hnt (red) and Stg-LacZ (green). **C**) DAPI (cyan), Cut (red) and Fzr-LacZ (green). **D**) Arrowheads indicate P-H3, Cyclin B and Fzr-LacZ expressing cells in MES egg chambers. P-H3 (grey), Cyclin B (red) and Fzr-LacZ (green). **E**) Arrowheads indicate P-H3 and Cyclin B expressing cells in MES egg chambers. Cyclin B (grey), NRE-LacZ (red) and P-H3 (green). **F**) Arrowheads indicate EdU incorporation in a few cells from MES egg chambers. EdU (grey), Cut (red) and NRE-LacZ (green). **G**) Cyclin B (red), Fzr-LacZ (green) and P-H3 (grey). Scale bar: 50 µm.



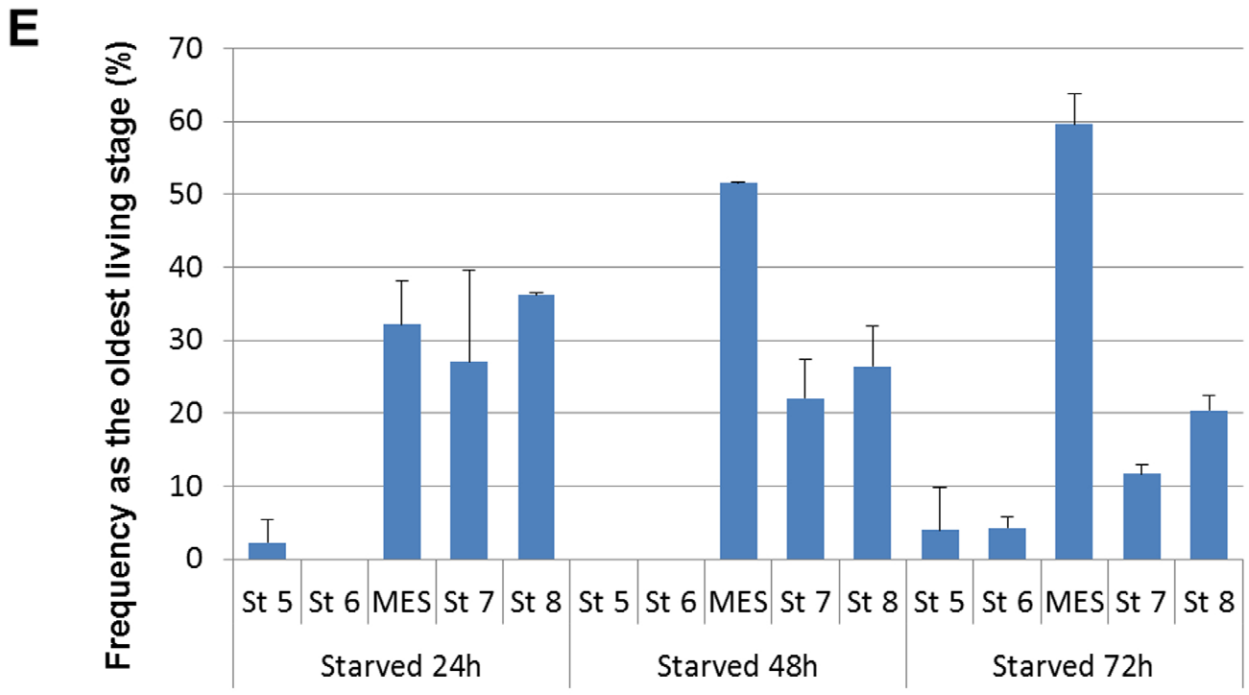


Fig. S2: Starvation-induced paused MES are in the same cell cycle state as MES.
All egg chambers are from flies starved for 24 hrs. **A**) DAPI (cyan), Cut (red) and Fzr-LacZ (green). **B**) P-H3 (grey), Cyclin B (red) and Fzr-LacZ (green). **C**) Cyclin B (grey), NRE-LacZ (red) and P-H3 (green). **D**) EdU (grey), Cut (red) and NRE-LacZ (green). **E**) Distribution of egg chambers occupying the last position before degenerating egg chambers. The results show a progressive increase in paused MES egg chambers over time. Scale bar: 50 µm.

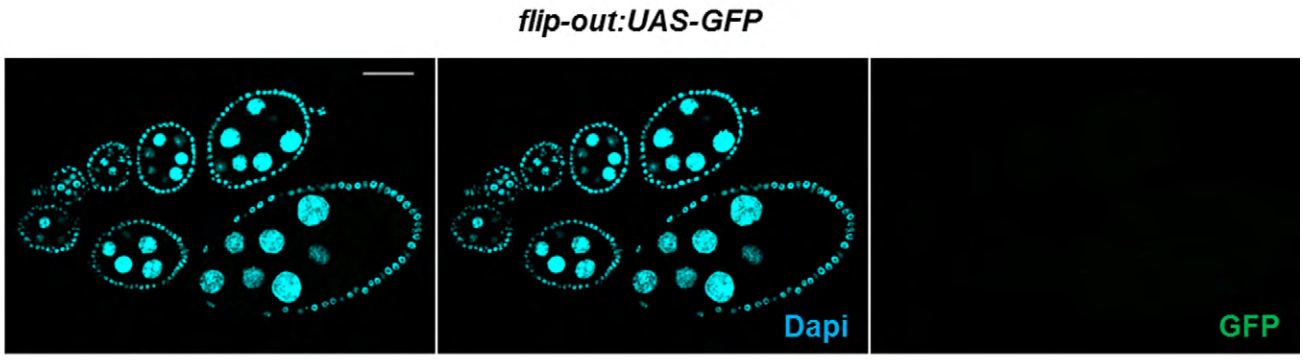


Fig. S3: Re-feeding triggers the entry into the endocycle.
The line used to generate flip-out clones (in Fig. 3) does not show leakiness.

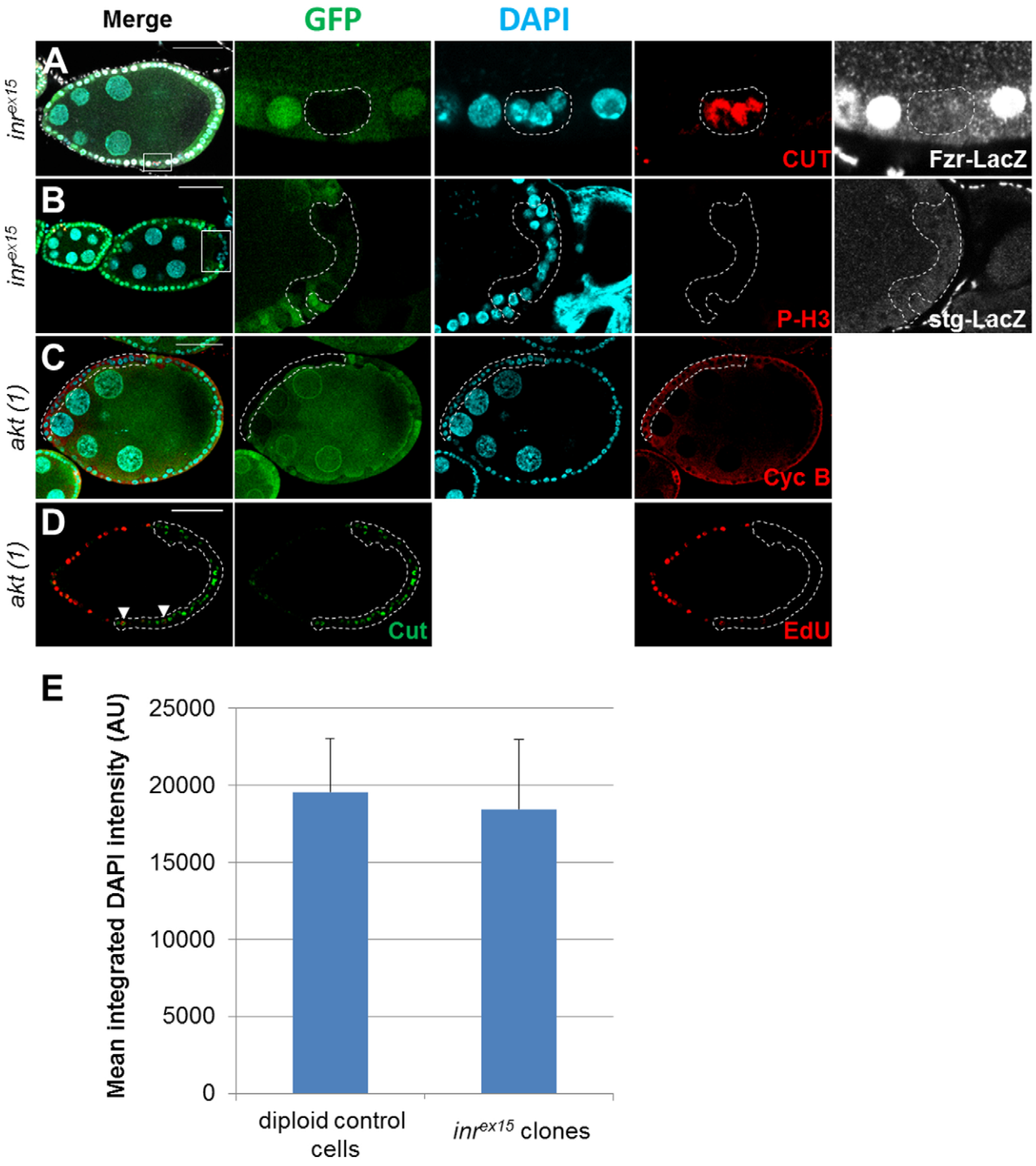


Fig. S4: Loss of function for IIS induces paused MES cells with intermediate cell cycle phenotype.
(**A-D**) Cross-section of *dinr* (A,B) and *dakt* (C,D) loss-of-function clones generated in stage 8 egg chambers. Mutant follicle cells are outlined and marked by the absence of GFP (green) or by Cut expression. Mutant clones are negative for fzr-lacZ (grey) (**A**), stg-lacZ (grey) and P-H3 (red) (**B**), CycB (red) (**C**). **D**) Some rare mutant cells show weak EdU (red) staining (arrow-head) and express Cut (green). **E**) Histogram showing the integrated DAPI intensity from control diploid cells or from stage 7-9 egg chambers of inr^{ex15} mutant cells. The results show that they are not statistically different. N≥50, $P^{N.S}$=0.166. Scale bar: 50 µm.

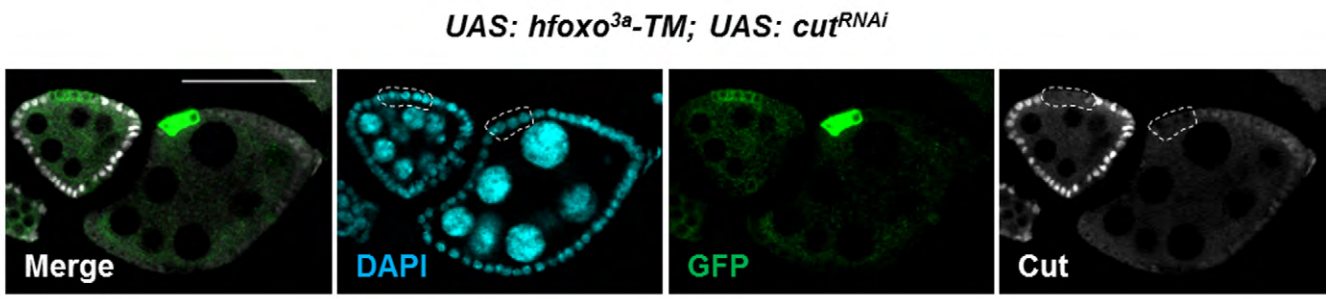


Fig. S5: Efficiency of *cut* RNAi silencing.
Cut expression in flip-out clones from stage 5 and 7 egg chambers expressing *cut* RNAi in a foxo3A (activating) background (*act<<gal4-UAS:GFP; UAS-hfoxo3a-TM; UAS-cut*^{RNAi}). DAPI (cyan), GFP (green), Cut (grey). Scale bar: 50 µm.

Table S1: Determination of MES stage duration

	n	Frequency (%)	Duration (hrs)
Stage 5	230	48.5	5
MES stage	95	20	2

MES duration was estimated by its relative frequency compared with stage 5 within each ovariole (3 independent experiments, *n*>100 in each experiment). Results show that MES are observed in 20% of ovarioles, compared with 48.5 % for stage 5 egg chambers (25°C; NRE>GFP/CyO genetic background). Therefore, the duration for MES is estimated at 2 hours, well consistent with the transient nature of MES.