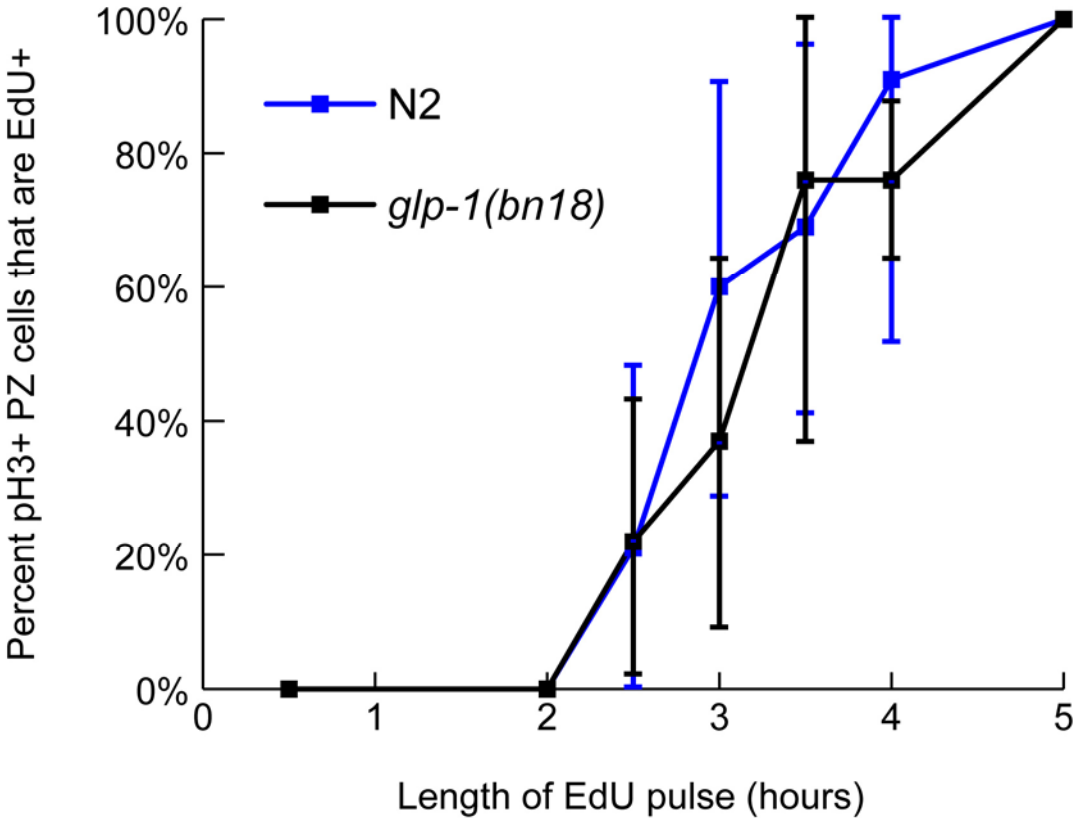

Figure S1 Analysis of G2 length in *glp-1(bn18).* Animals were fed EdU labelled bacteria for the indicated length of time at 15° and subsequently harvested and dissected. Germlines were stained to detect EdU incorporation and with pH3 antibody to detect PZ cells in M-phase. The graph displays the percentage of M-phase cells that were EdU positive versus length of EdU pulse. Since EdU is incorporated during S-phase, the length of time required for EdU labelled cells to reach M-phase provides an estimate of the length of G2. At ~3 hours, 50% of M-phase cells in both wild type N2 and *glp-1(bn18)* were EdU positive, and at 5 hours, 100% were EdU positive. This indicates that for both N2 and *glp-1(bn18)* the median and maximum length of G2 is 3 and 5 hours, respectively. For each time point, at least 10 germlines were scored. Error bars show standard deviation.

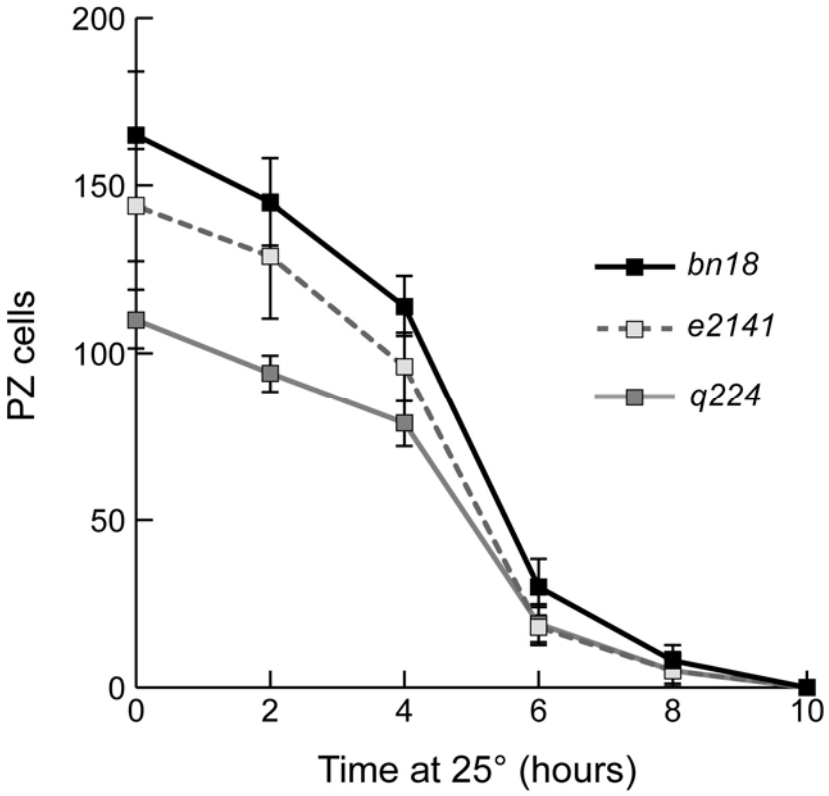

Figure S2 Comparison of meiotic entry kinetics of *glp-1(ts)* mutants shifted to restrictive temperature (25°). Adults were raised at permissive temperature (15°), staged to be 24 hours past L4 and shifted to restrictive temperature (25°). Animals were harvested after the indicated period at restrictive temperature and stained with REC-8 and HIM-3 antibody to detect PZ cells versus meiotic prophase cells. The number of PZ cells was counted and the average per germline plotted versus time. Although *e2141* and *q224* mutants had fewer proliferative zone cells at permissive temperature steady state than *bn18*, they displayed similar kinetics of proliferative zone differentiation following shift to restrictive temperature. For each time point, at least eight germlines were scored. Error bars indicate standard deviation.

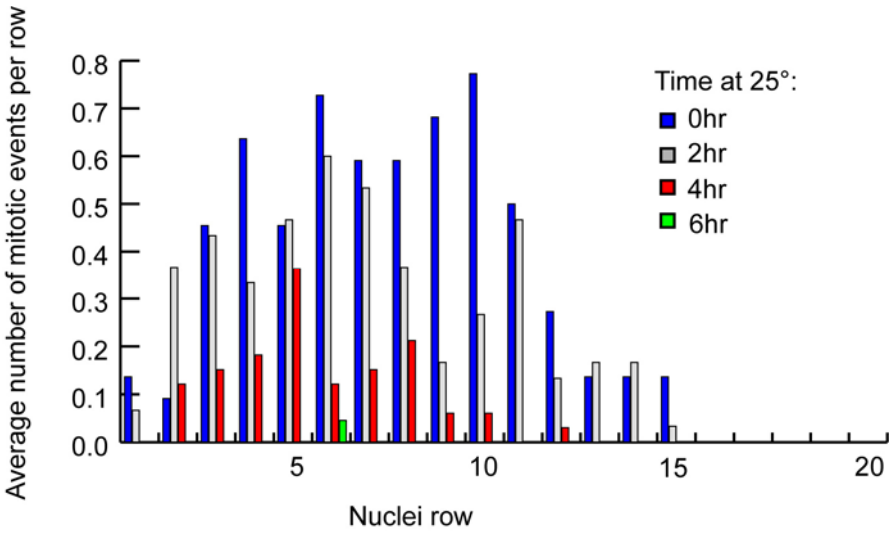

Figure S3 Distribution of M-phase in *glp-1(bn18)* shifted to restrictive temperature. *glp-1(bn18)* animals were shifted from 15° to 25° and dissected germlines were stained with pH3 to label M-phase. The position of M-phase cells were scored based on position, in cell diameters, from the distal tip. The histogram plots the average number of M-phase cells per row. 0 hours, *n*=23; 2 hours, *n*=30; 4 hours, *n*=33; 6 hours, *n*=35 (germlines).

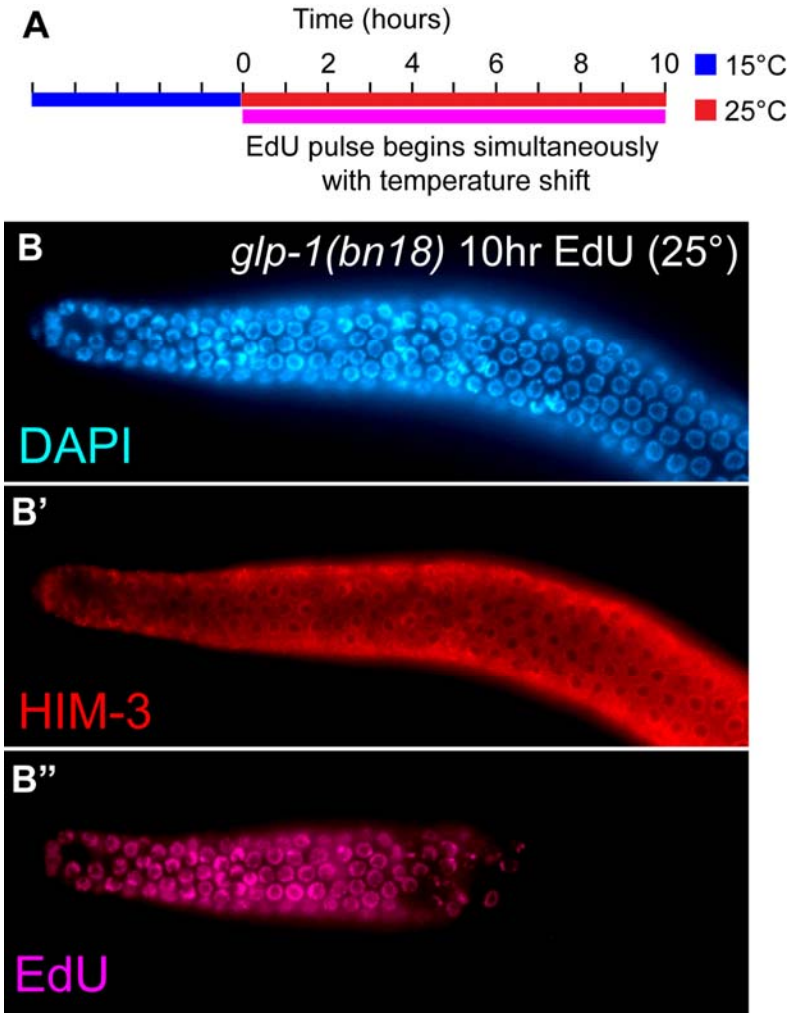

Figure S4 PZ cells in mitotic G2 undergo mitosis and meiotic S-phase prior to meiotic entry. (A) *glp-1(bn18)* mutants were shifted to restrictive temperature and simultaneously given a continuous EdU labelling, as indicated. (B) Representative image of the distal region of a germline after the 10 hour EdU labelling at restrictive temperature. Note that all germ cells have entered meiosis and all germ cells within ~15 cell diameters of the distal tip are EdU positive.

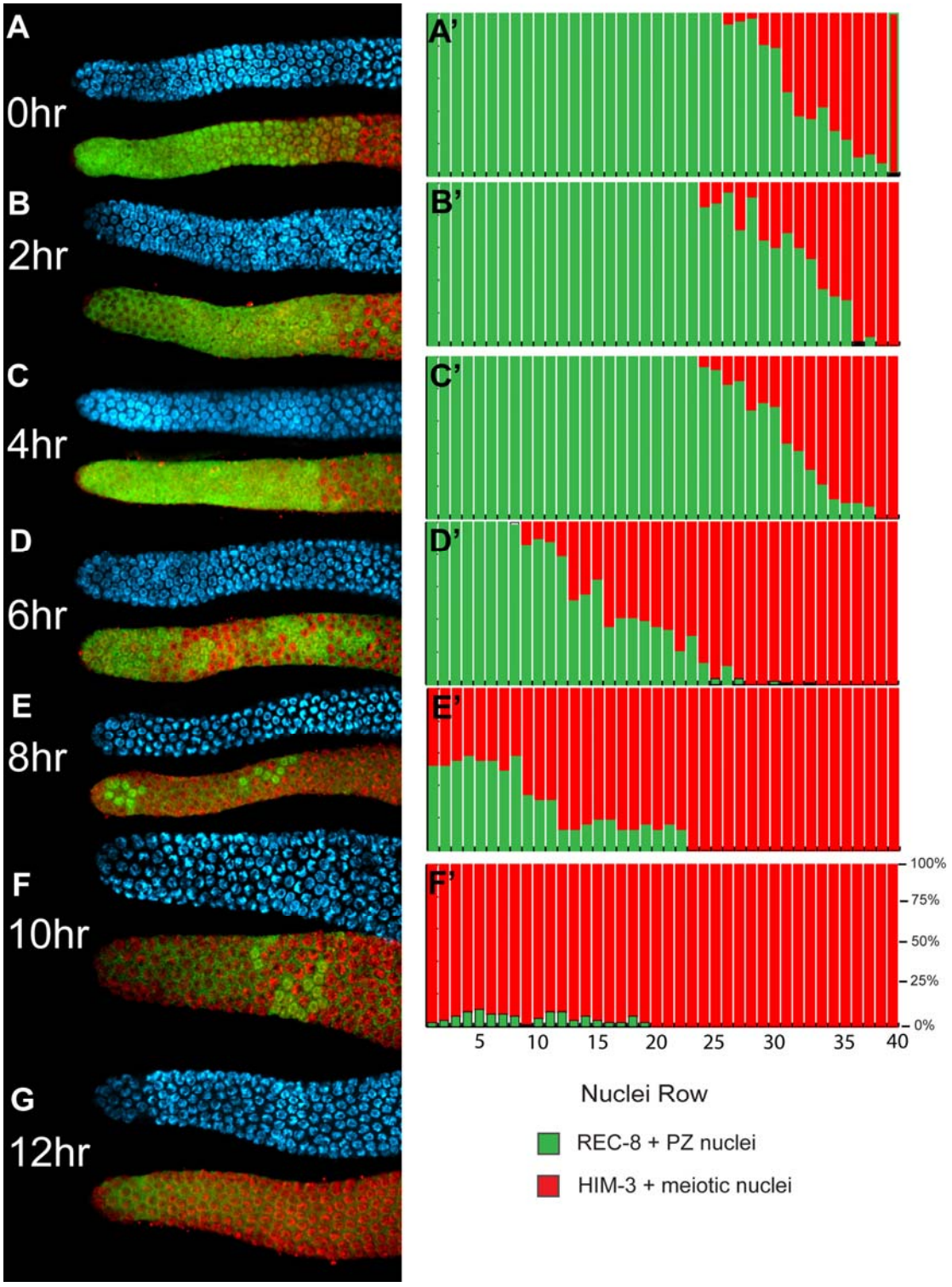

Figure S5 Distribution of PZ cells in *glp-1(bn18); gld-2* double mutants shifted to restrictive temperature. *glp-1(bn18); gld-2* mutants were shifted to the restrictive temperature (25°) for the indicated time. (A-G) Distal region of representative germlines stained with DAPI (blue), REC-8 antibody (green) and HIM-3 antibody (red). (A'-F') Graphs show the percentage of cells that are REC-8 positive (green) or HIM-3 positive (red) within cell rows defined by distance from the distal tip.

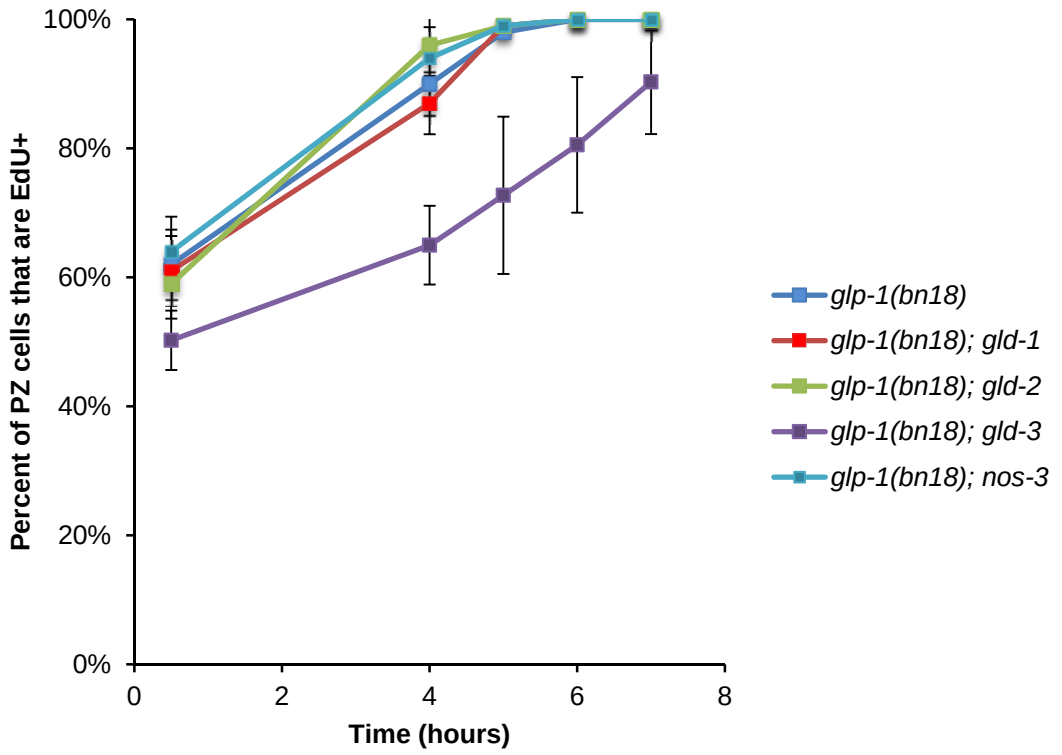

Figure S6 Analysis of the length of G2+M+G1 in double mutants affecting the GLD-1 or GLD-2 pathways. Animals were staged to 24 hours past L4, transferred to EdU plates, dissected after the indicated EdU labelling time and stained for EdU incorporation and with REC-8 antibody to identify PZ cells. The percent of PZ cells that were EdU positive was scored versus time of EdU labelling. The length of G2+M+G1 is equal to the length of EdU pulse required to label all PZ cells with EdU. For all double mutants, except *glp-1(bn18); gld-3*, the length of G2+M+G1 was 5 hours. In *gld-3; glp-1(bn18)*, some PZ cells remained EdU negative after 5 hours, indicating a longer G2+M+G1 and thus a longer cell cycle length. All experiments were at 15^{o}. The alleles used for the meiotic entry genes are likely null (see Materials and Methods).

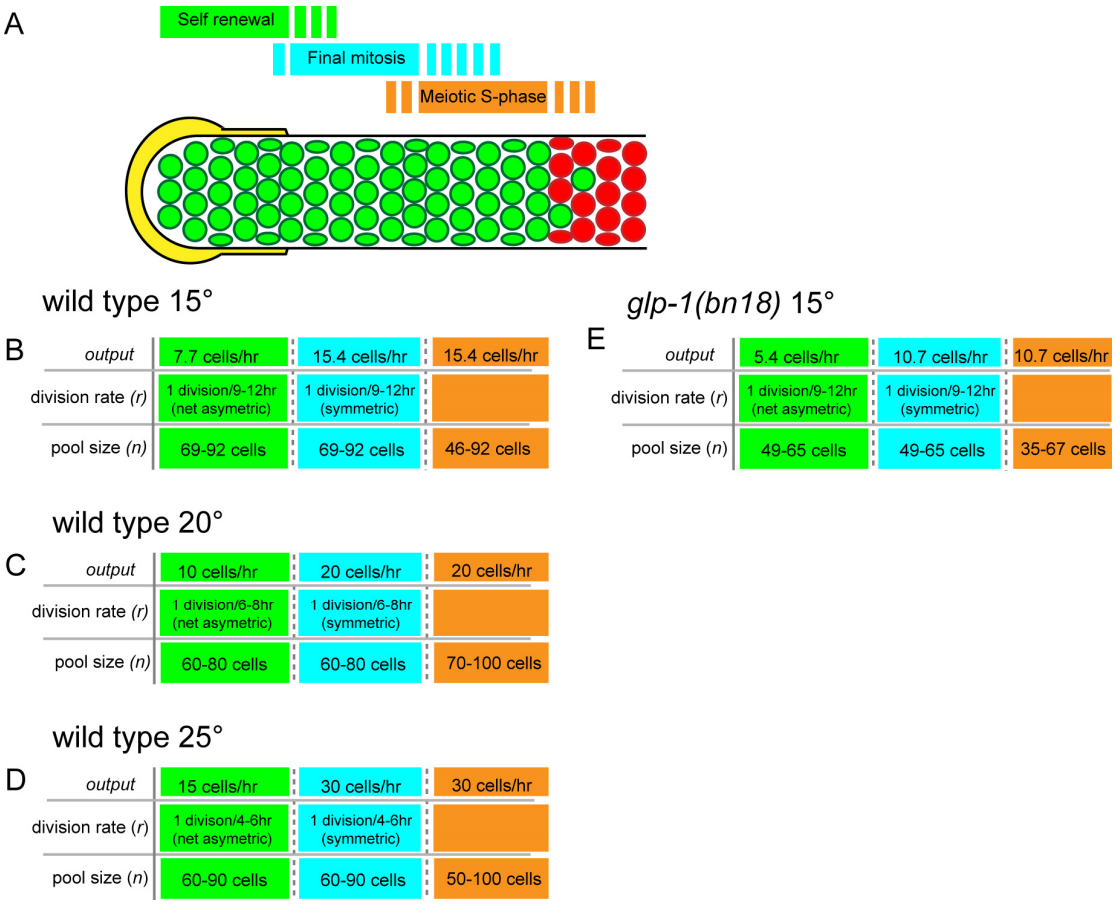

Figure S7 Models of proliferative zone dynamics in wild type at different temperatures and for the *glp-1(bn18)* mutant at 15°. (A) Proliferative zone cells (green) can be assigned to three separate pools: a self renewal pool, final mitosis pool and meiotic S-phase pool (see Discussion, Figure 10). Based on the model of proliferative zone dynamics presented in the Discussion, we assign predicted pool sizes for the adult wild type proliferative zone at 15°, 20° and 25° (B-D) and *glp-1(bn18)* mutant at 15° (E) based on the observed output and division rate. The observed output and division rate of wild type at 20° and 25° (C-D) is based on Fox *et al* 2011.