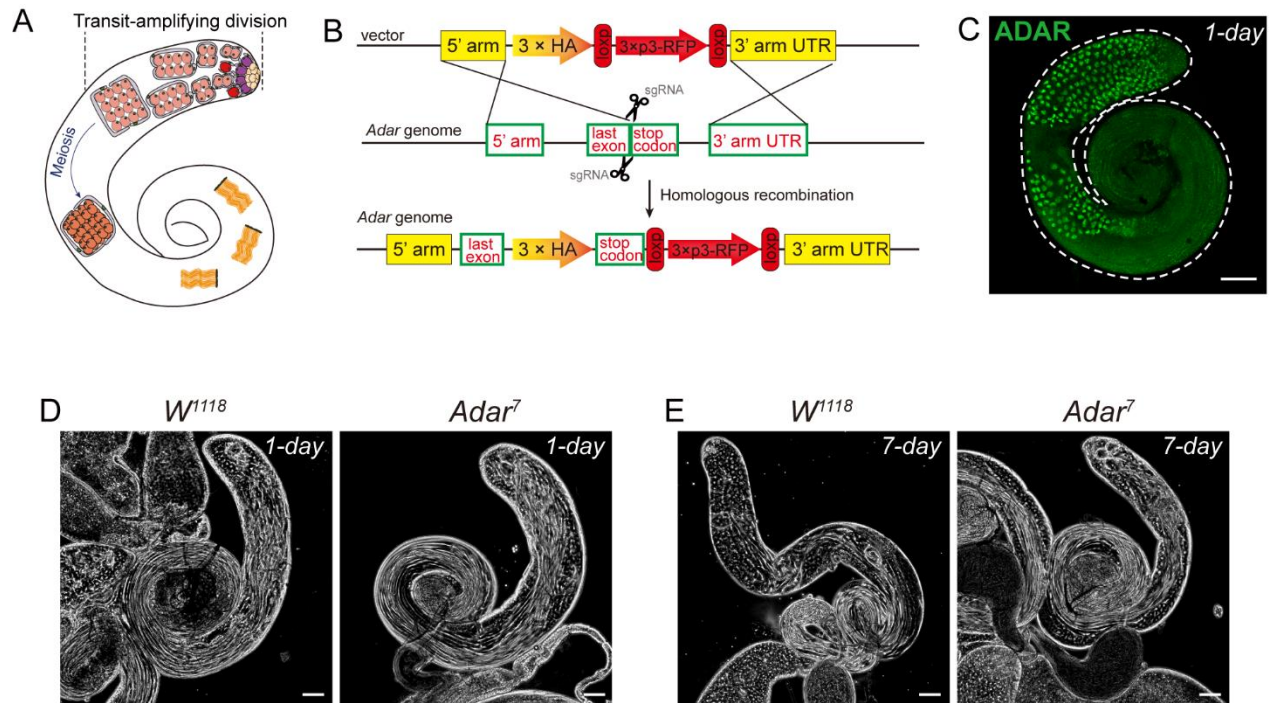
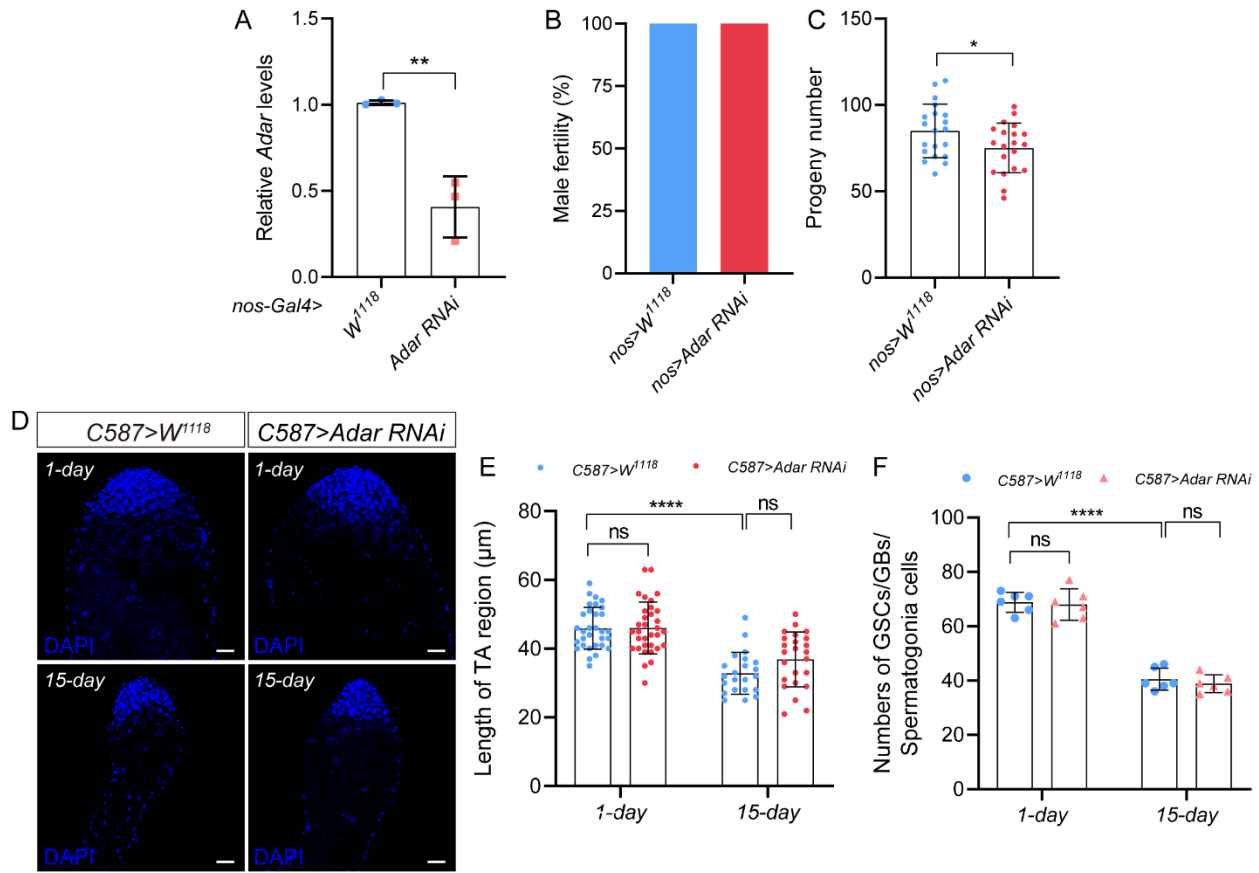


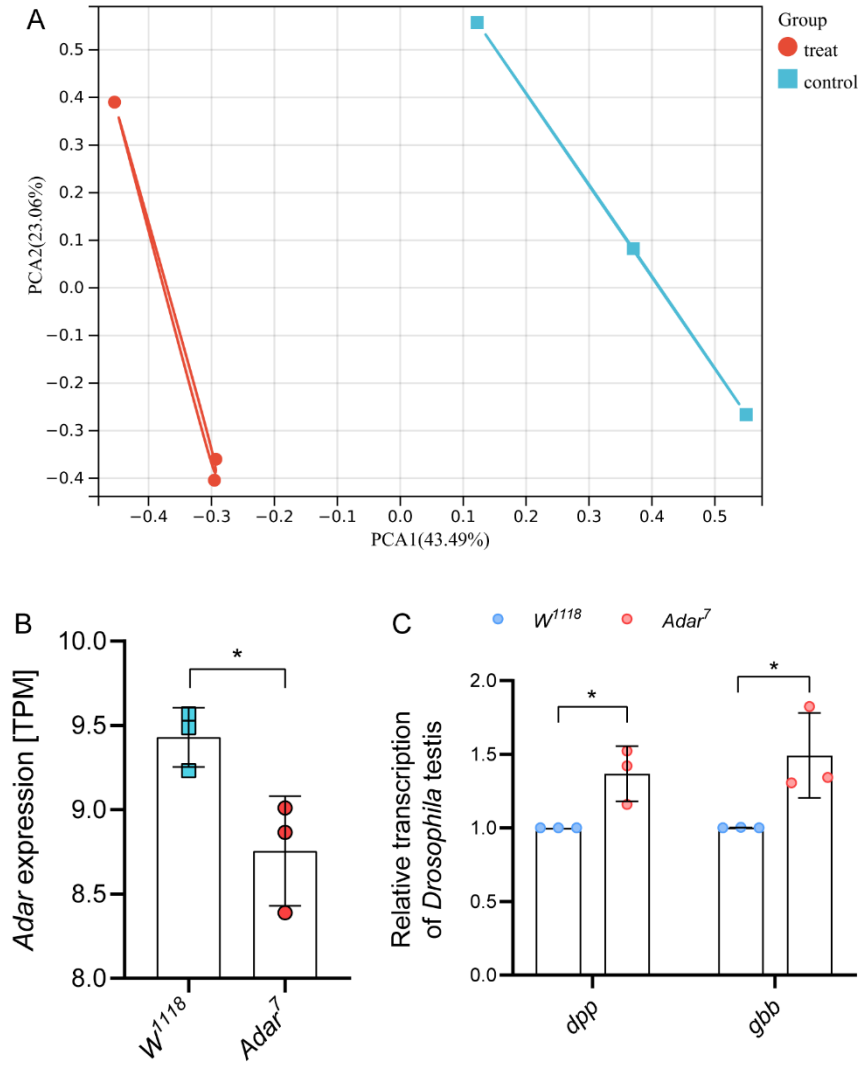
## Supplementary Figures



**Figure S1.** ADAR expression in germline cells and its mutant morphology. (A) Schematic diagram of testis tissue in *Drosophila*. (B) The approach utilized for generating the endogenous *Drosophila* ADAR-HA knock-in line entailed applying the CRISPR/Cas9 system. For details, please refer to the methods. (C) Representative image of ADAR (green) in the testis of 1-day flies. Scale bars represented 100  $\mu\text{m}$ . (D and E) Testes of wildtype and *Adar* mutants. Scale bars represented 75  $\mu\text{m}$ .



**Figure S2.** Depletion of ADAR in GSC leads to the accumulation of transit-amplifying germline cells in *Drosophila* testis. (A) *Adar* mRNA levels in flies carrying *nos-Gal4*-driven *Adar RNAi*. The expression in the control group was normalized to 1 (n = 3 biologically independent samples). (B and C) Rate of male fertility and mean number of progeny for flies of different genotypes. (D) Immunofluorescence images of testis carrying *C587-Gal4*-driven *W<sup>1118</sup>* (control) and *Adar RNAi*. DAPI-stained (blue) bright cells were TA regions. Scale bars represented 20  $\mu$ m. (E) Quantification of the length of TA regions in the testis of flies carrying *C587-Gal4*-driven *W<sup>1118</sup>* (control) and *Adar RNAi*. Each dot represents a testis. (F) Quantifying the number of GSCs, GBs, and spermatogonia in different genotypes of *Drosophila*. \*,  $p < 0.05$ ; \*\*,  $p < 0.01$ ; \*\*\*\*,  $p < 0.0001$ , ns,  $p > 0.05$ .



**Figure S3.** *Adar* regulates male germline stem and progenitor cell differentiation through modulation of BMP signaling. **(A)** Principal component analysis (PCA) of RNA-seq data. The control group indicated *W<sup>1118</sup>*, and the treat group indicated *Adar<sup>7</sup>*. **(B)** TPM (Transcripts Per Kilobase Million) values of *Adar* RNA expression in the RNA-seq data from 15-day *W<sup>1118</sup>* (control) and *Adar<sup>7</sup>* (n = 3 biologically independent samples). **(C)** Relative mRNA fold changes of *dpp* and *gbb* in 15-day *W<sup>1118</sup>* (control) and *Adar<sup>7</sup>*. The expression in the control group was normalized to 1 (n = 3 biologically independent samples). \*,  $p < 0.05$ .