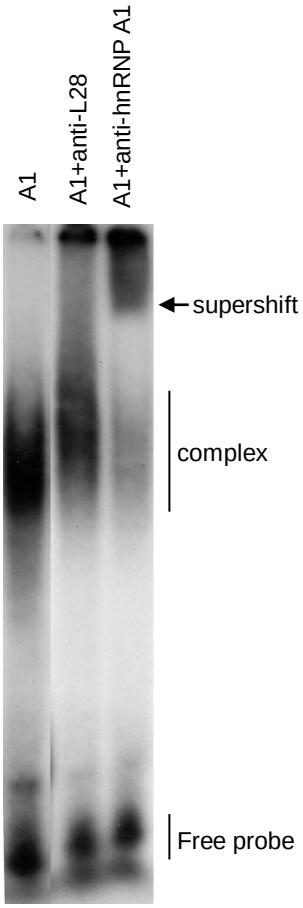
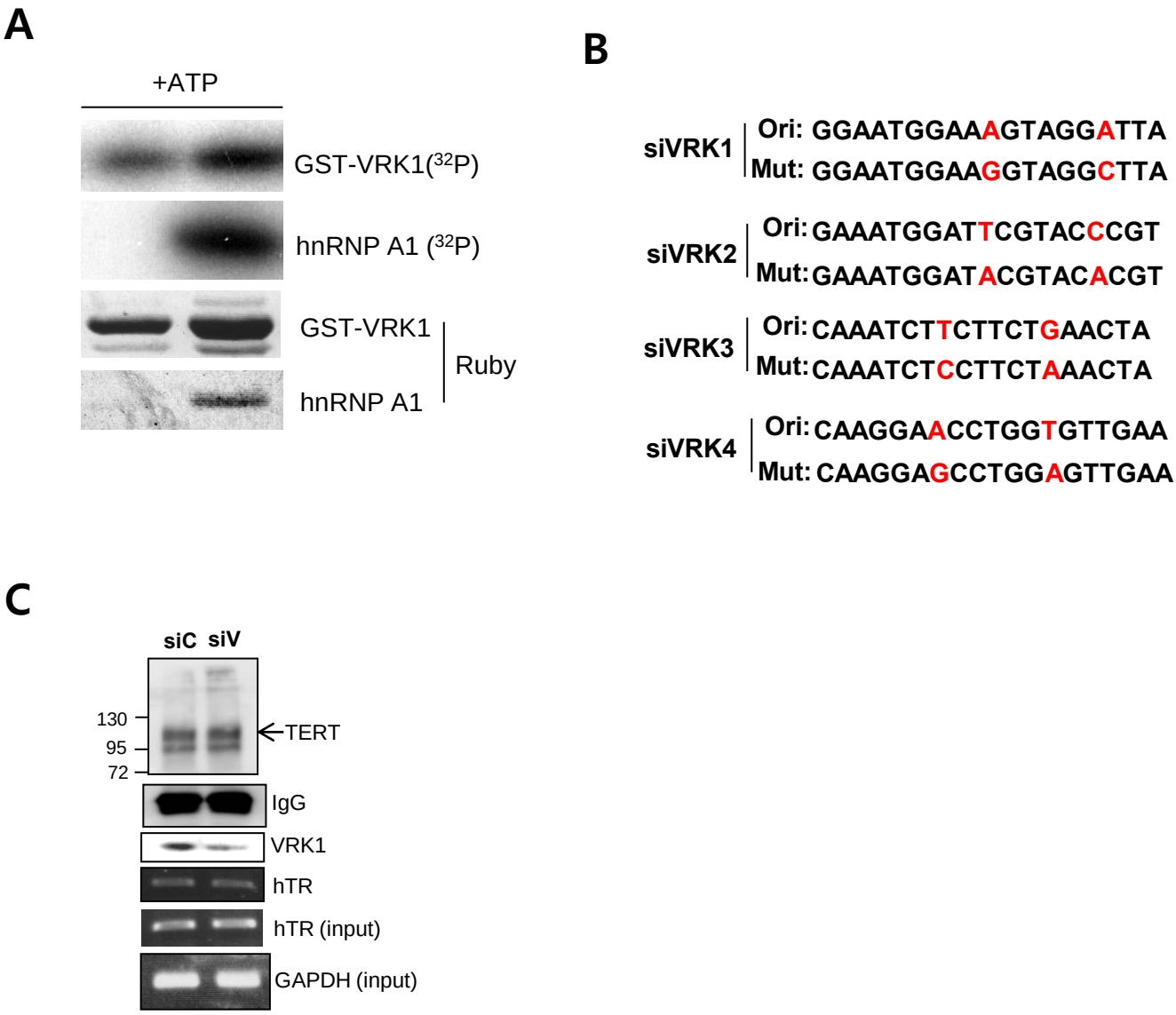
Supplementary figure 1



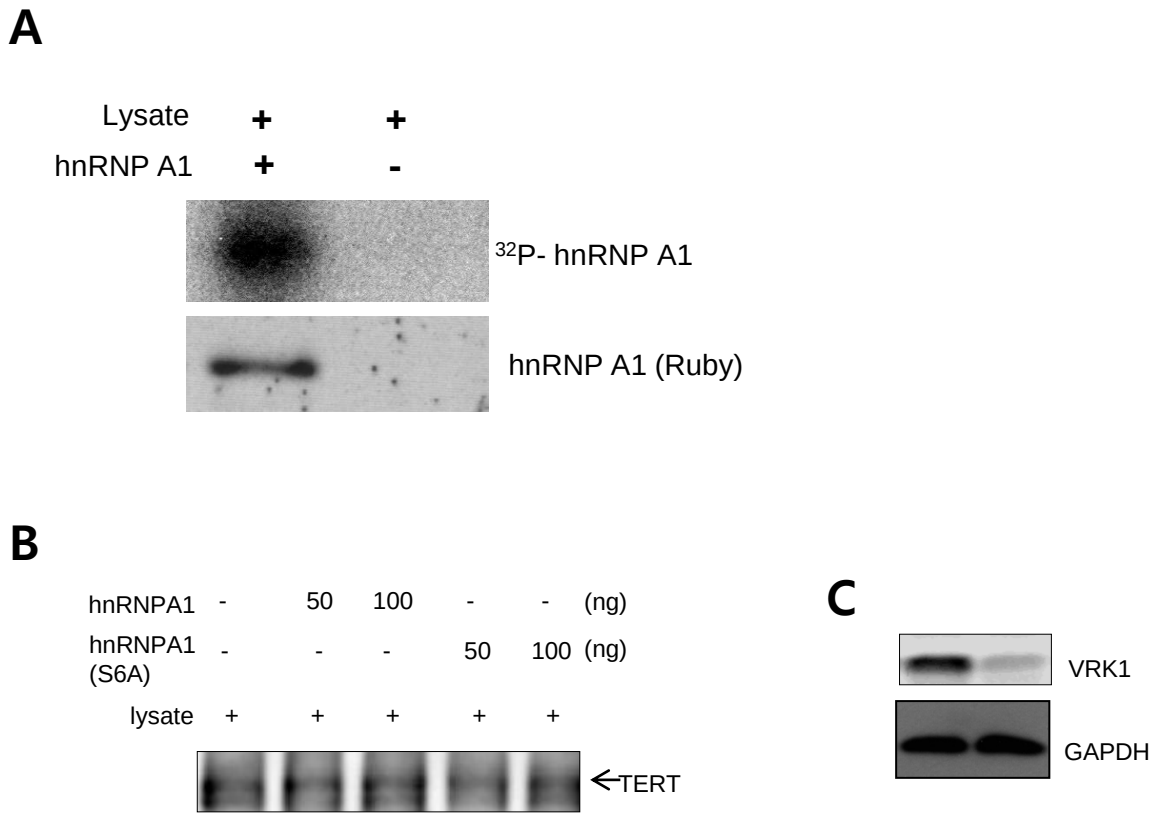
Supplementary Figure 1. Identification of the complex of hnRNP A1 and Telo7 using antibodies. 1μg of hnRNP A1 was incubated with ^{32}P-Telo 7 for each reaction. The complex of hnRNP A1-Telo7 was confirmed with anti-hnRNP A1 antibody or nonspecific antibody (RPL28 antibody).

Supplementary figure 2



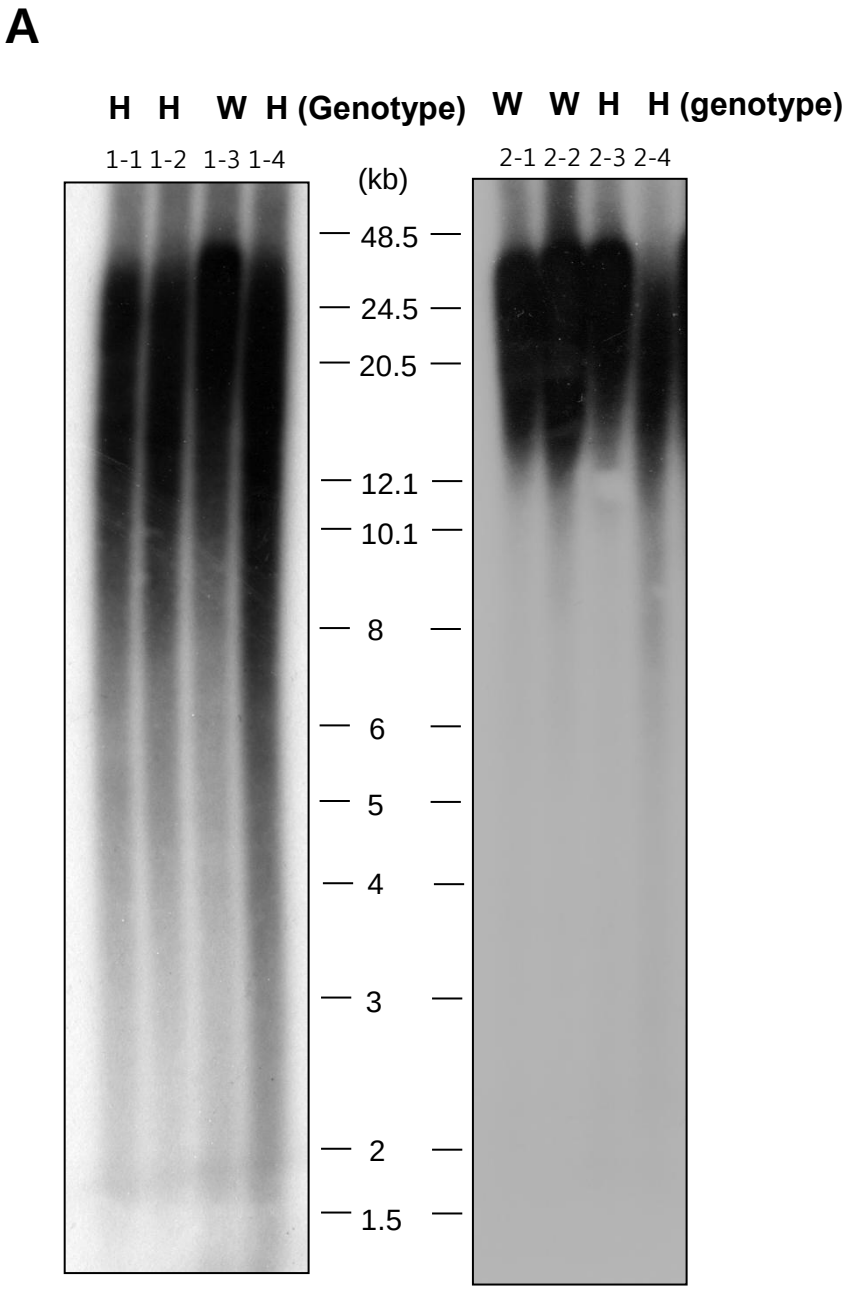
Supplementary Figure 2. (A) To confirm the phosphorylation of hnRNP A1, hnRNP A1 was incubated in the kinase reaction condition with ^{32}P-ATP, which was performed simultaneously with the kinase reaction for EMSA using cold ATP. (B) For the rescue experiment, site-directed mutagenesis with two sites of silent mutation in siVRK1 targeting sequence of VRK1 gene were generated. (C) Telomerase complex was immunoprecipitated with TERT antibody from Control or VRK1-depleted cell lysates. Telomerase RNA (TR) was identified with semi-quantitative PCR (see Materials and Methods). GAPDH gene was amplified and loaded for the control.

Supplementary figure 3



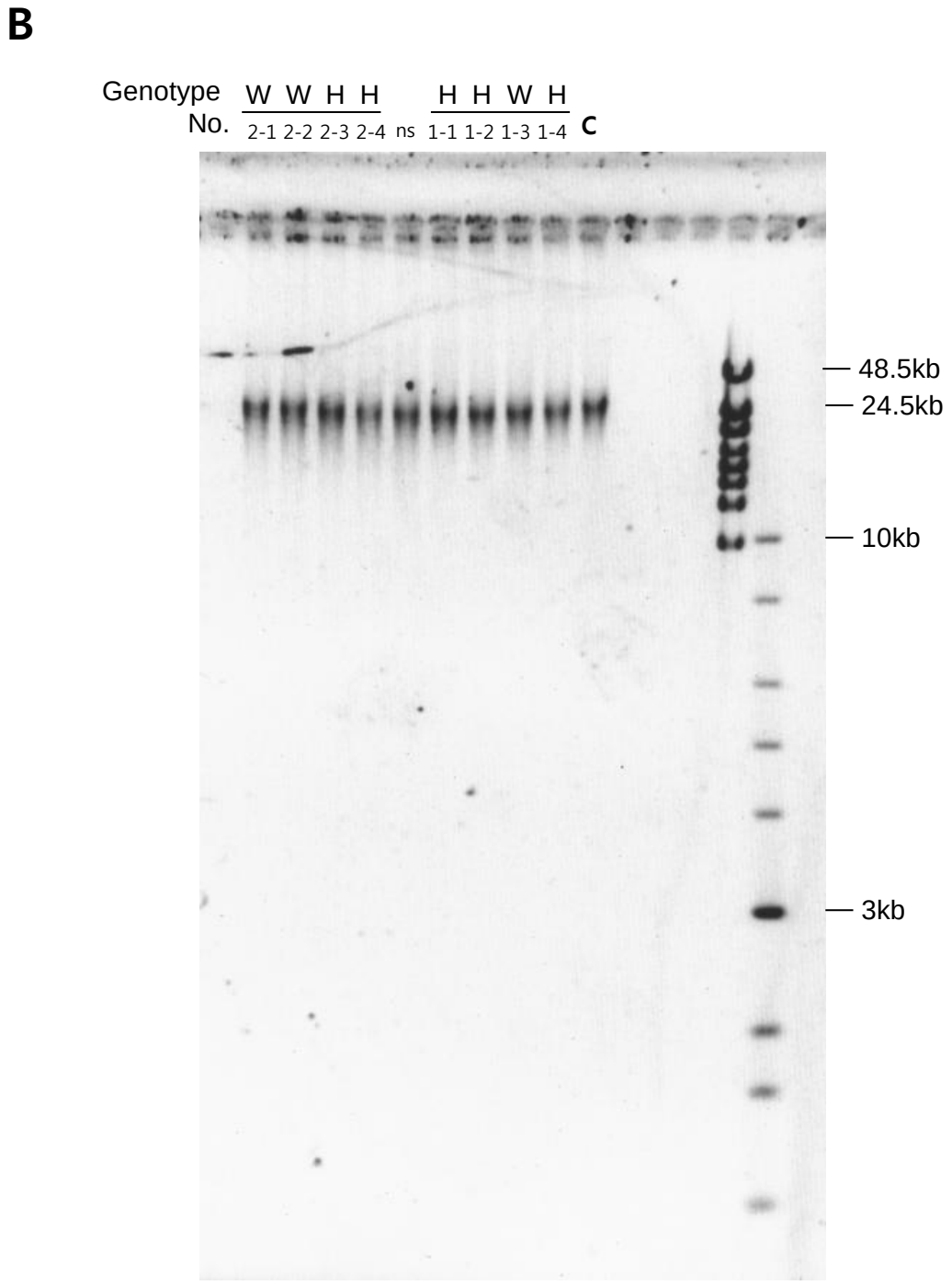
Supplementary Figure 3. (A) 0.5μg of hnRNP A1 was incubated with hnRNP A1-depleted cell lysate in a telomerase activity assay condition. hnRNP A1 was labeled with ^{32}P represented by autoradiography. The bottom panel shows hnRNP A1 stained by SYPRO® Ruby protein gel staining solution. (B) TERT was quantified in each reaction of telomerase activity assay (C) For the T-OLA experiment, knock-down of VRK1 was confirmed by Western blot.

Supplementary figure 4



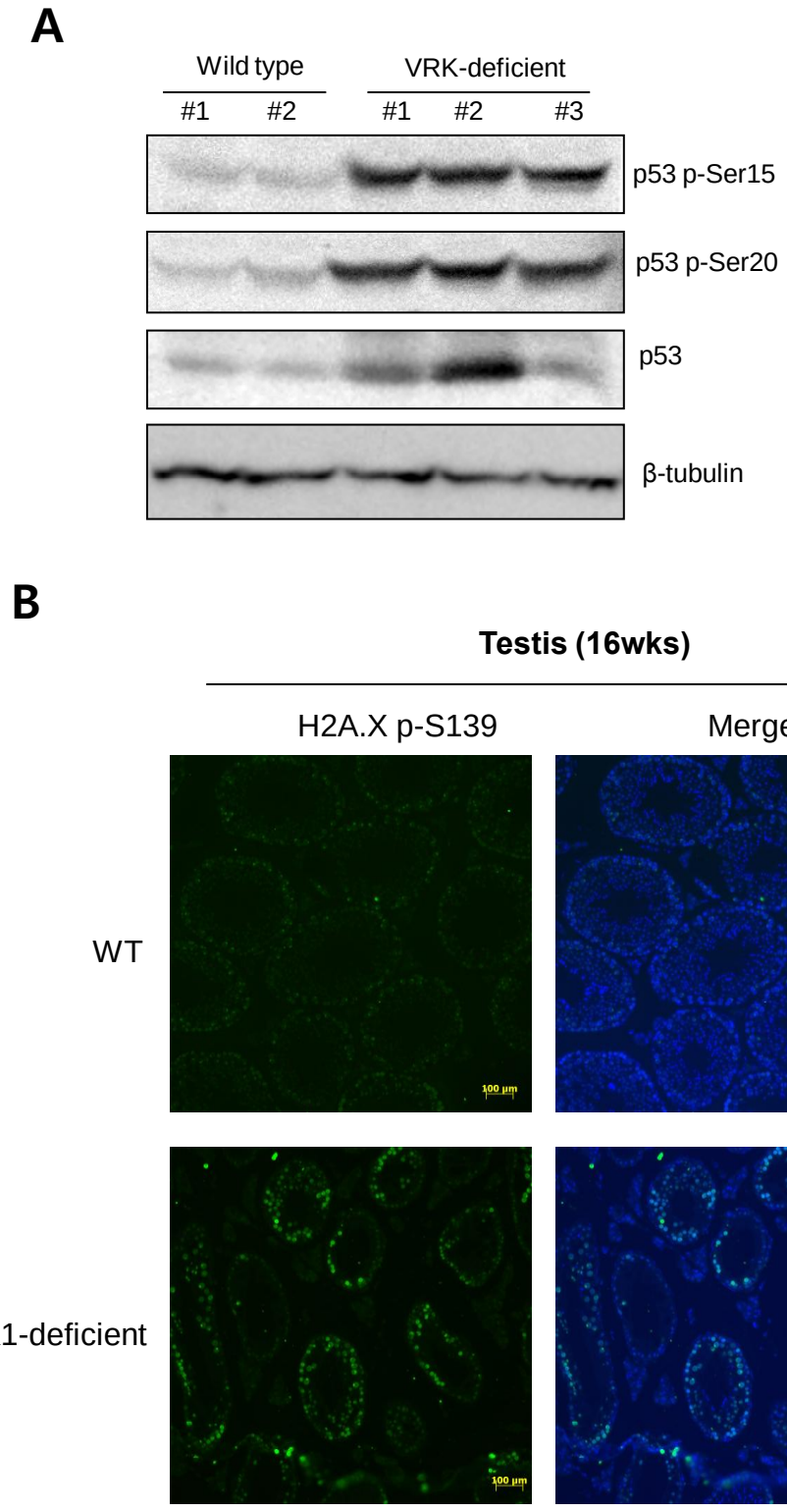
Supplementary Figure 4. gDNA of WT (n=3) and VRK1-deficient testes (n=5) were analyzed by TRF assay. Each panels show results of TRF assay from individual litters.

Supplementary figure 4



Supplementary Figure 4. Evaluation of DNA integrity. Genomic DNA samples (100ng) were resolved on a 0.7 % agarose gel at 25V for 17hrs. Genomic DNA from wild type C57BL/6 mouse (C; control) was loaded as a control. Genomic DNA samples used in TRF assay are intact appearing as single compact crowns. (ns. Non-specific)

Supplementary figure 5



Supplementary Figure 5. DNA-damage signaling activated in VRK1-deficient testes. (A) Wild type (n=2) and VRK1-deficient testes (n=3) were analyzed by Western blot. β-tubulin is used as a loading control. (B) Testis sections from wild type and VRK1-deficient mice were stained with H2A.X p-Ser139 antibody. Scale bar=100 μm.