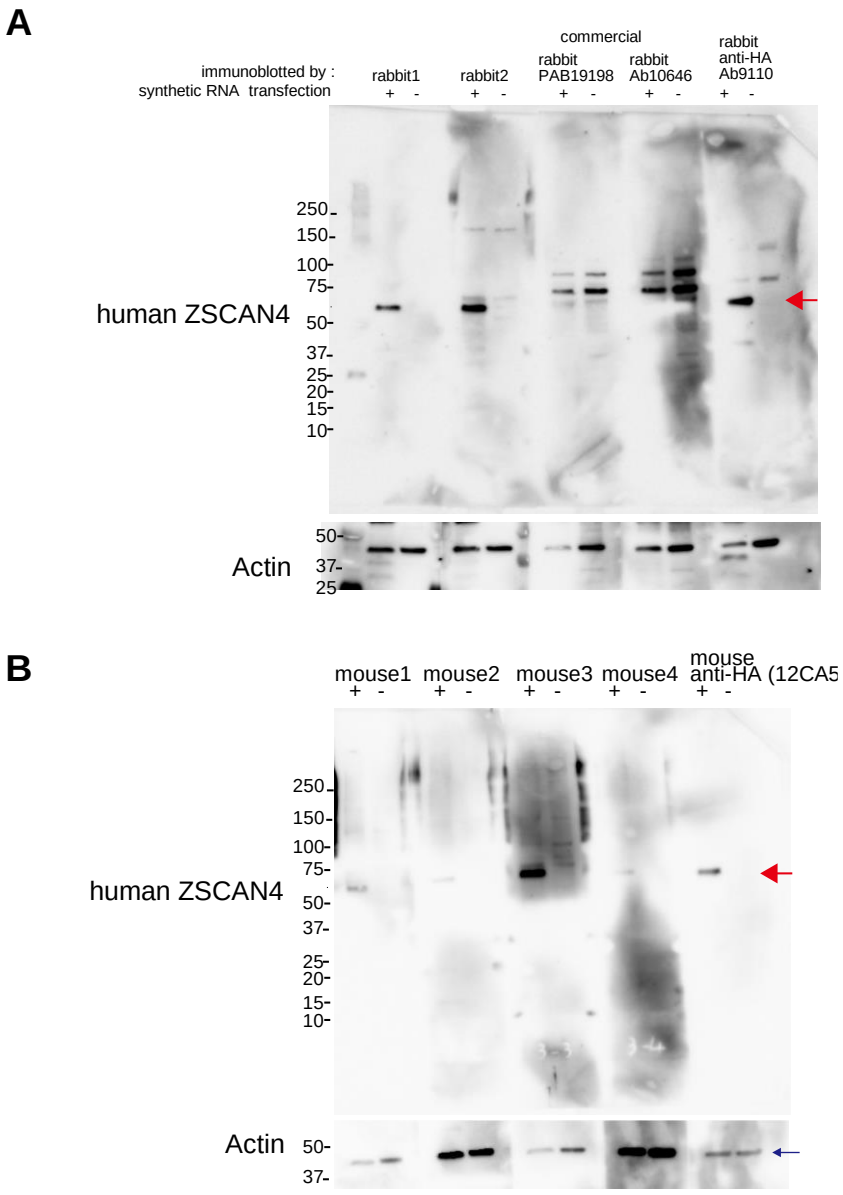

FIG. S1. Validation of newly generated anti-human ZSCAN4 antibodies

(**A**) Specificity of anti-human ZSCAN4 antibodies were assessed by western blotting. Human ES cells were transfected with or without synthetic mRNA encoding human ZSCAN4-3xFLAG-HA. Whole-cell lysates were examined by newly generated anti-human ZSCAN4 antibodies raised in rabbits. Two commercially available rabbit anti-human ZSCAN4 antibodies were examined simultaneously. For positive control, expression of ZSCAN4-3xFLAG-HA was probed by the anti-HA antibody. (**B**) Newly generated mouse anti-human ZSCAN4 antibodies were examined, as in **A**.

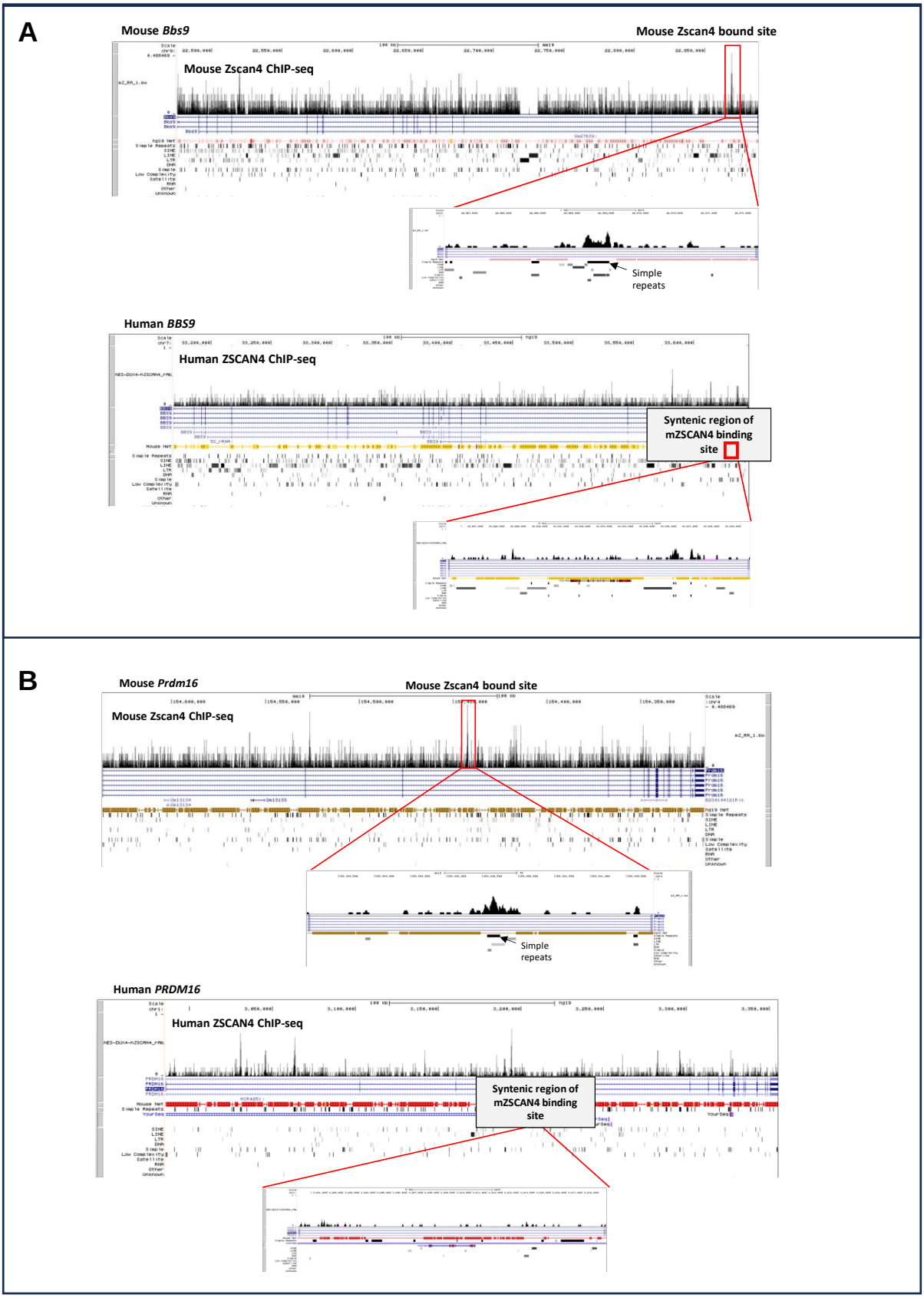
A
Mouse Bbs9
Mouse Zscan4 bound site
Mouse Zscan4 ChIP-seq
Simple repeats
Human BBS9
Human ZSCAN4 ChIP-seq
Syntenic region of mZSCAN4 binding site
B
Mouse Prdm16
Mouse Zscan4 bound site
Mouse Zscan4 ChIP-seq
Simple repeats
Human PRDM16
Human ZSCAN4 ChIP-seq
Syntenic region of mZSCAN4 binding site

FIG S2

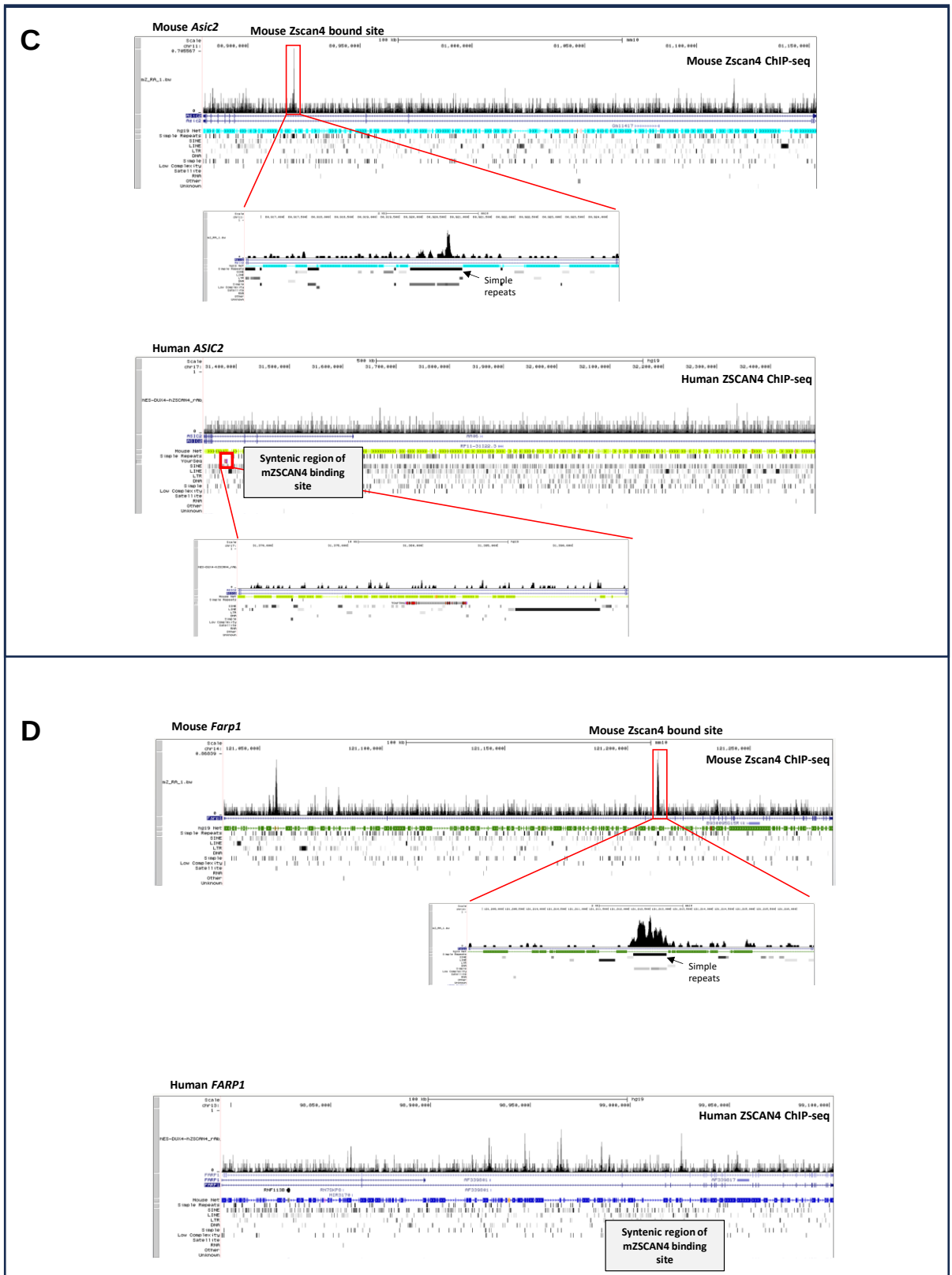
C
Mouse Asic2
Mouse Zscan4 bound site
Mouse Zscan4 ChIP-seq
Simple repeats
Human ASIC2
Human ZSCAN4 ChIP-seq
Syntenic region of mZSCAN4 binding site
D
Mouse Farp1
Mouse Zscan4 bound site
Mouse Zscan4 ChIP-seq
Simple repeats
Human FARP1
Human ZSCAN4 ChIP-seq
Syntenic region of mZSCAN4 binding site

FIG S2

FIG. S2. Comparison of mZSCAN4-binding sites and hZSCAN4 binding sites. Representative regions of mouse genome (mm10) and human genome (hg19) regions where both mouse and human genes have mZSCAN4-binding sites and hZSCAN4 binding sites in their introns. (**A**) BBS9 gene, (**B**) Prdm16 gene, (**C**) Asci2 gene, (**D**) Farp1 gene. In each figure, the upper panel shows an mZscan4 binding site (ChIP-seq peaks) and the location of the microsatellites. The lower panel shows the corresponding human genome region (ChIP-seq peaks) and the location of microsatellites. The mZSCAN4-binding microsatellite locations do not align with hZSCAN4-binding microsatellite locations.

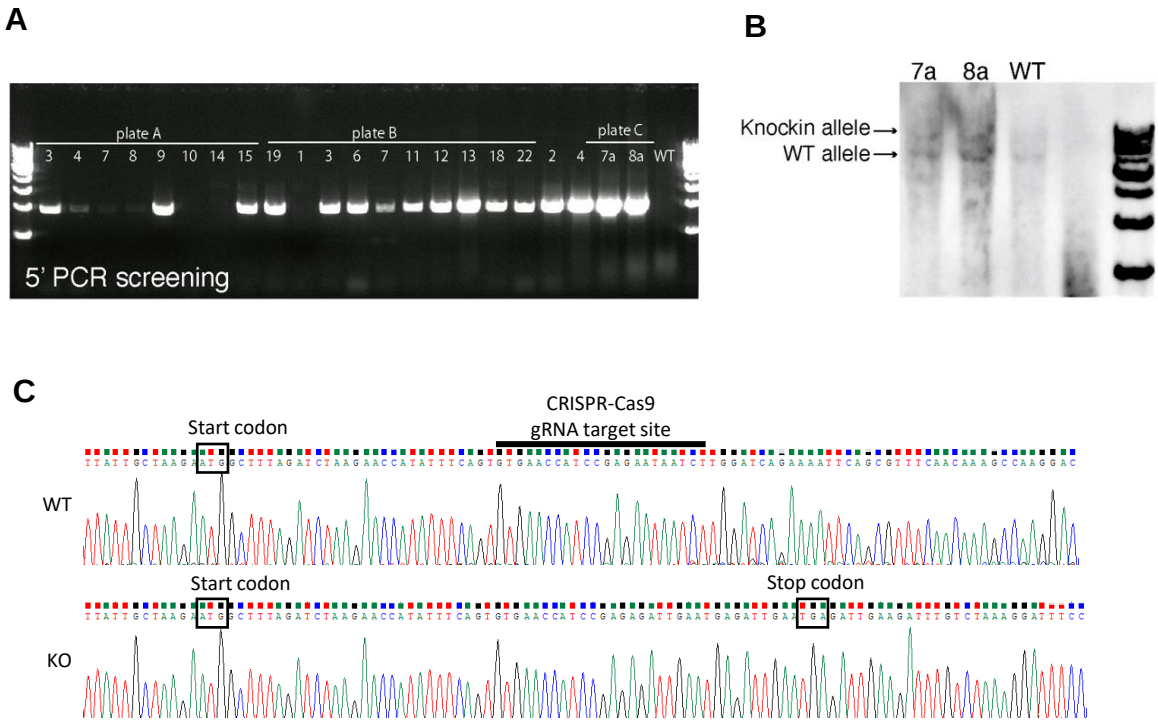

FIG. S3. Generation of hZSCAN4 knockout human ES cells.
(A) Screening for the targeted knock-in allele using 5'-side genotyping PCR.
(B) The *ZSCAN4-EGFP* knock-in allele from the two human ES clones were verified to be heterozygous by Southern blotting after HindIII digestion.
(C) Genomic DNA sequences of *ZSCAN4*-KO ES cells. Sanger sequencing analysis showing that CRISPR-Cas9 introduced an insertion mutation which results in a premature stop codon of ZSCAN4 gene locus.