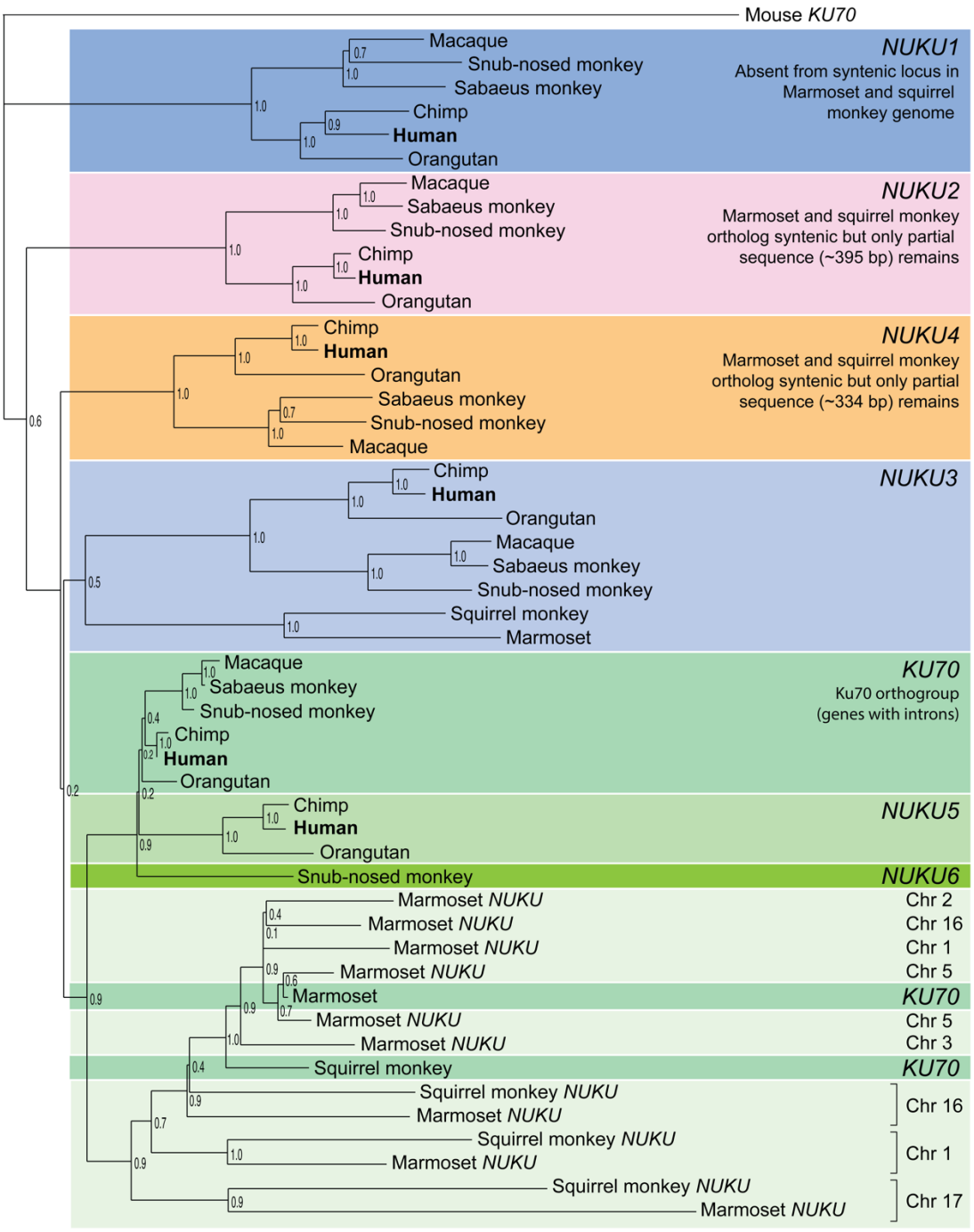


Figure S1. Phylogenetics of *KU70* derived retrocopies in eight primate species. A tree of *KU70* derived retrocopies sequences with Bootstrap values generated with the maximum likelihood method.

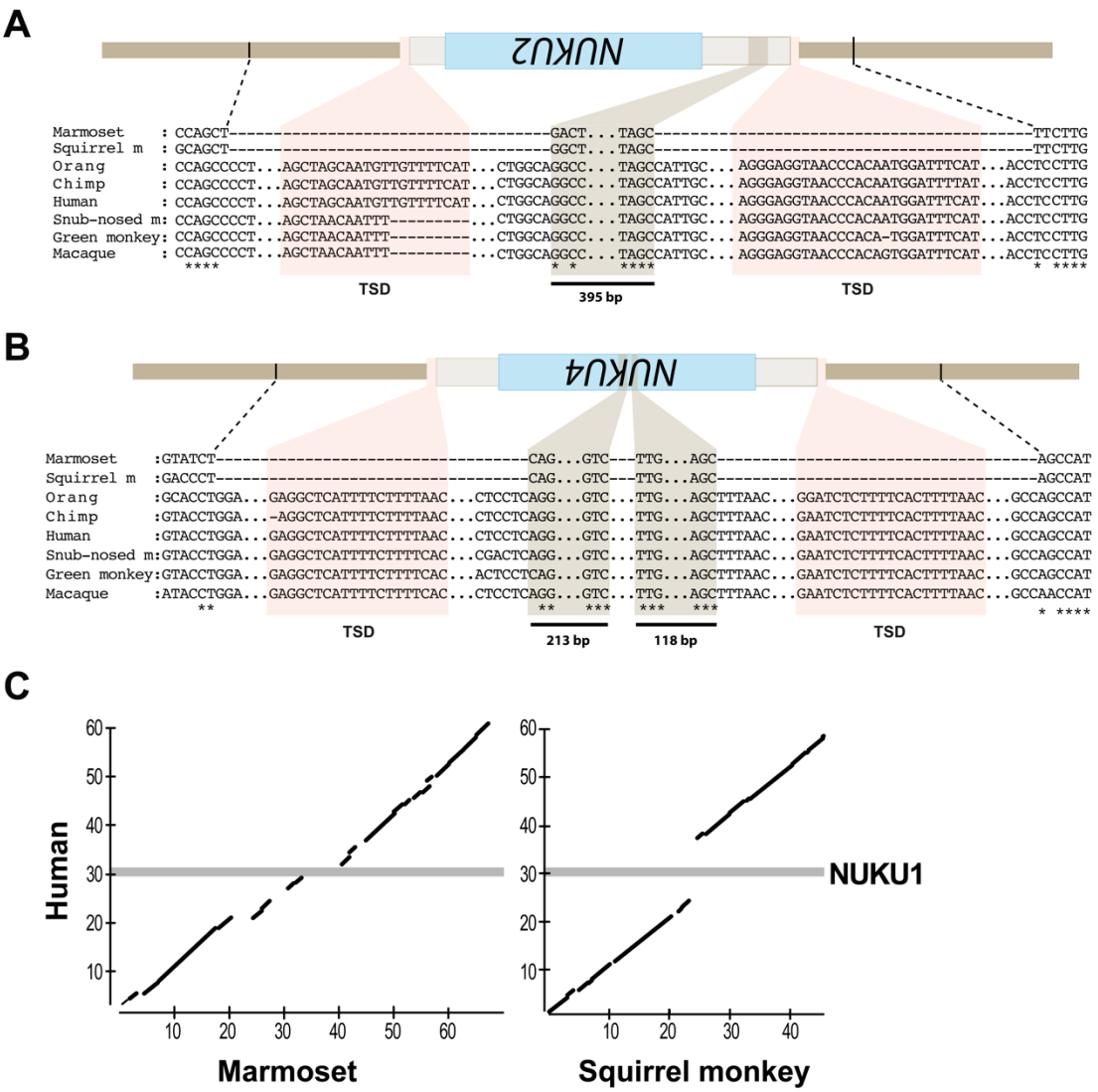


Figure S2. The evidence supporting the of the gain and loss of *NUKU* genes across different primate species. Remnants of (A) *NUKU2* and (B) *NUKU4* sequences in New World monkeys after gene deletion. Alignments show the sequence present at the syntenic position in each primate species. (C) Dot plot representation of the absence of *NUKU1* in marmoset and squirrel monkey genomes compared to the syntenic genome position in the human genome.

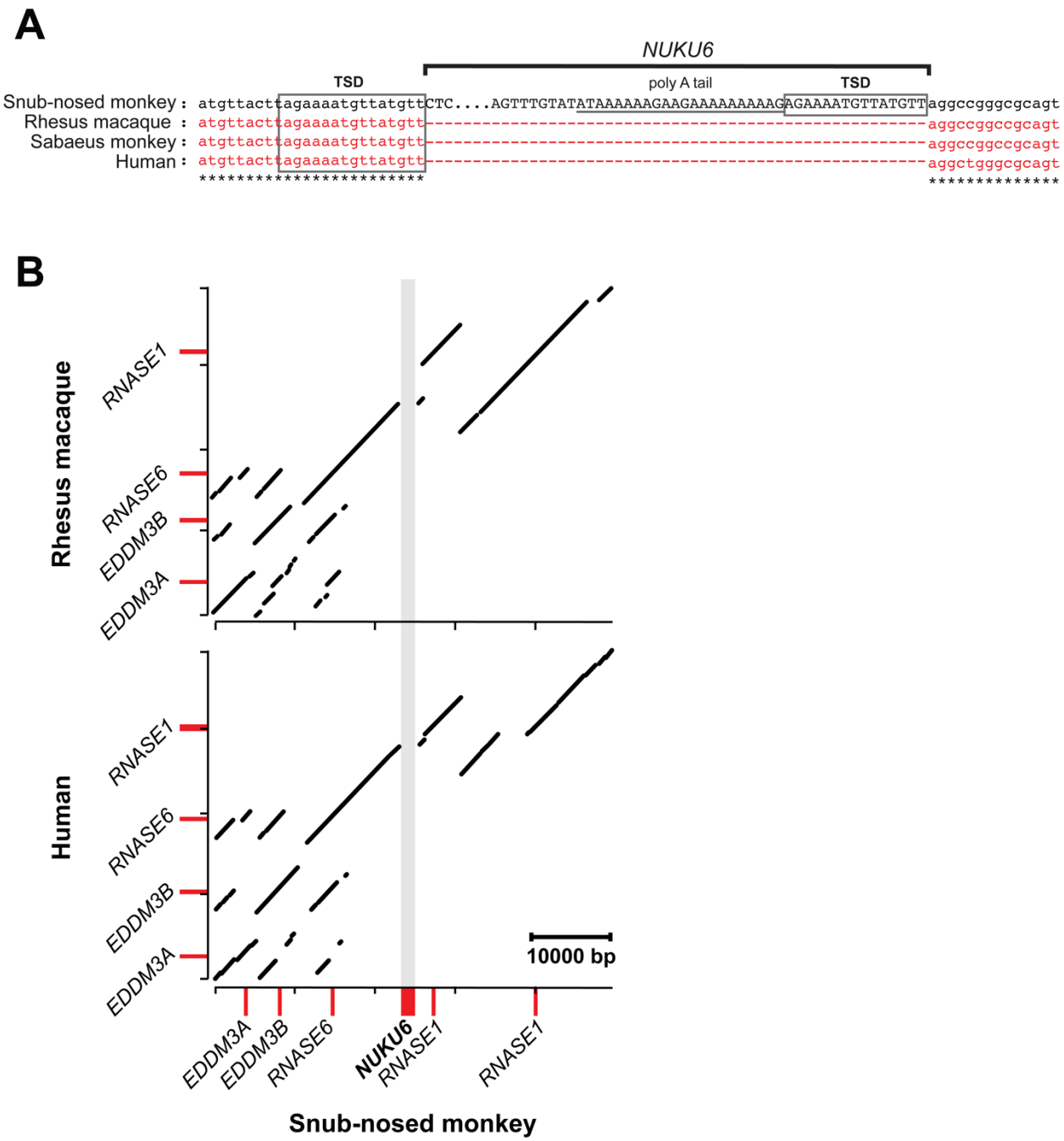


Figure S3. The unique insertion of *NUKU6* into the genome of the golden snub-nosed monkey. (A) Insertion of *NUKU6* compared to the syntenic locus of other primates and evidence of LINE-1 mediated target-site duplication (TSD) and the remnants of an mRNA-derived poly(A) tail. (B) Dot plot representation of the unique insertion of *NUKU6* in the golden snub-nosed monkey genome compared to the syntenic genome position in the human and rhesus macaque genomes.

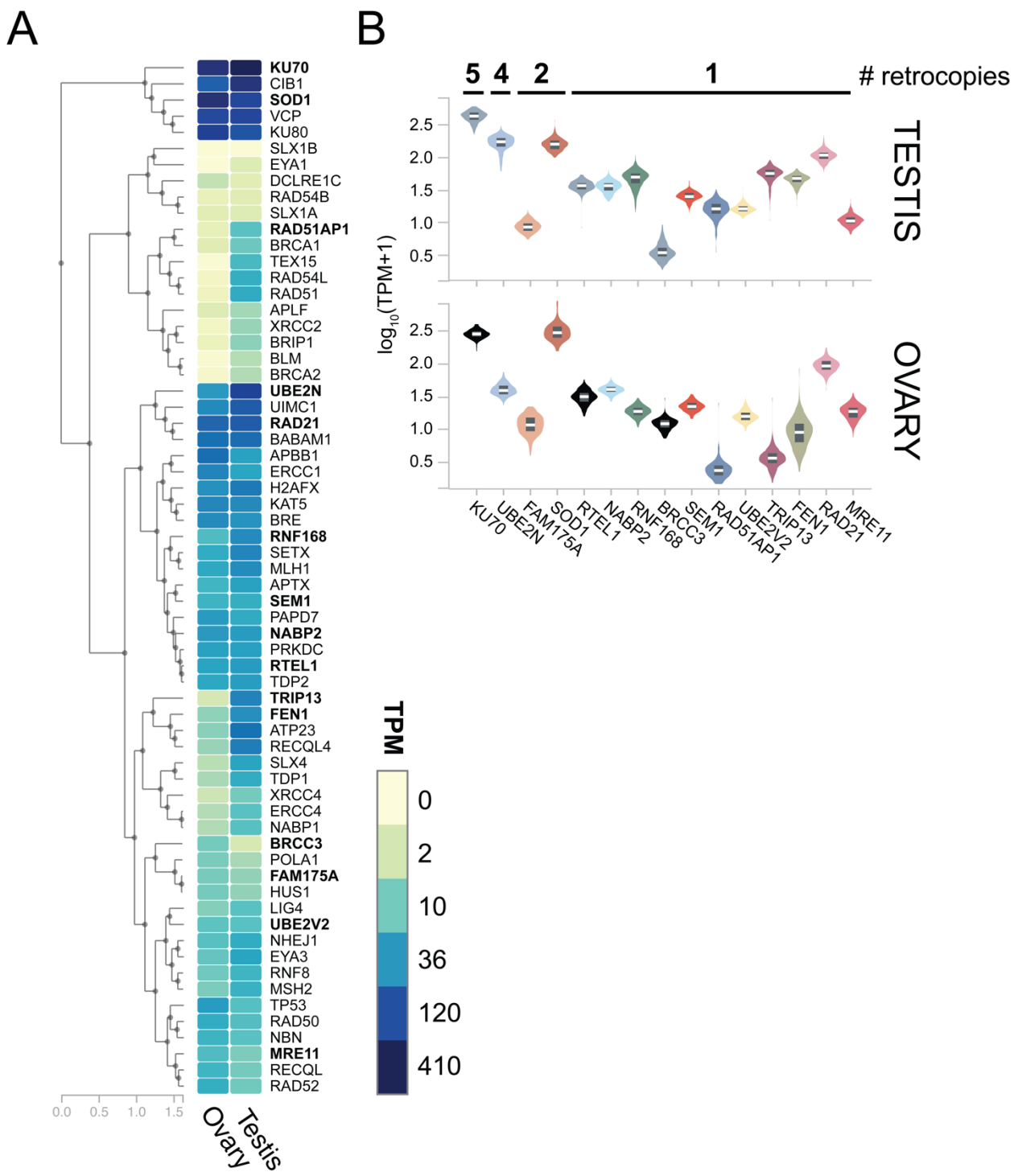


Figure S4. Testis and ovary expression of DNA repair genes. (A) Median transcripts per million (TPM) of 66 DNA repair genes identified by GO analysis in the human testis and ovary. Bold text indicates genes with identified retrocopies. (B) A comparison of $\log_{10}$ median TPM values of DNA repair genes with different numbers of retrocopies in the human testis and ovary.

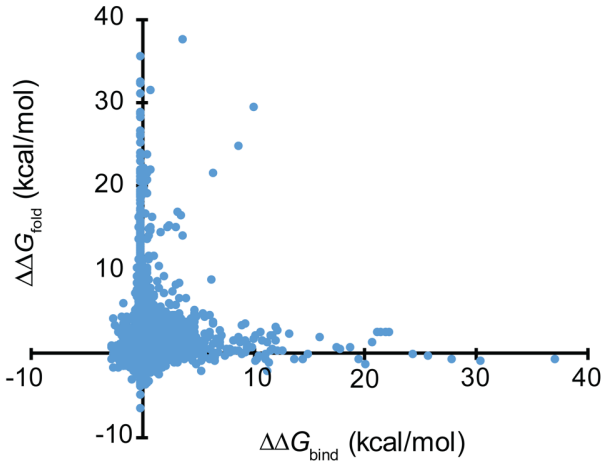


Figure S5. Molecular modeling of the interaction of Ku70p with Ku80p. For Ku70p every possible non-synonymous mutation was plotted to illustrate effects on $\Delta\Delta G_{fold}$. $\Delta\Delta G_{bind}$ was also calculated to predict mutations that would disrupt Ku70p-Ku80p binding.

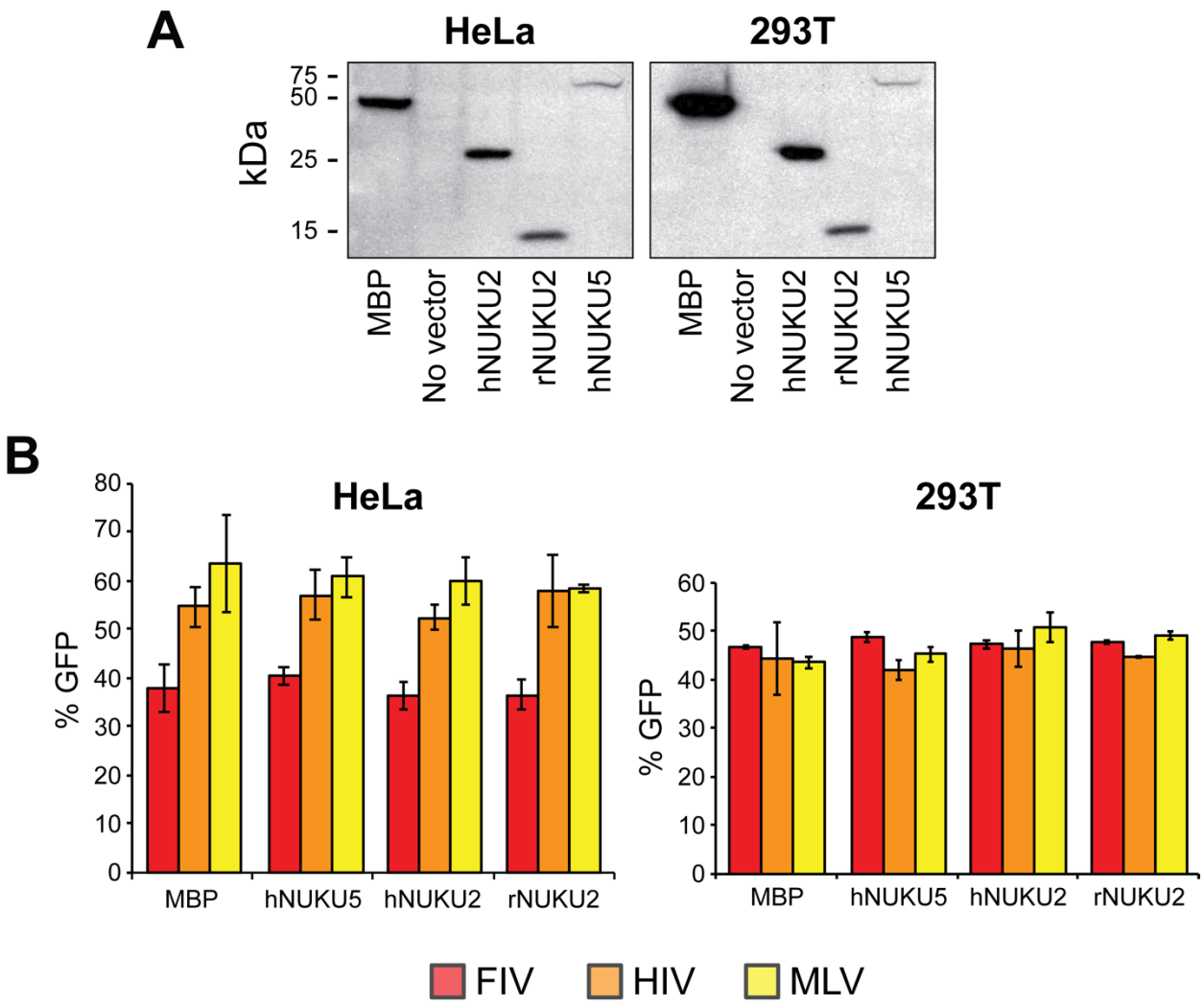


Figure S6. The expression of *NUKU* genes in cell culture does not inhibit retrovirus transduction. (A) The detection by Western blotting of NUKU proteins when transiently expressed in mammalian cell culture. (B) The detection of retrovirus transduction by flow cytometry indicating the percentage of cells that were positive for GFP.