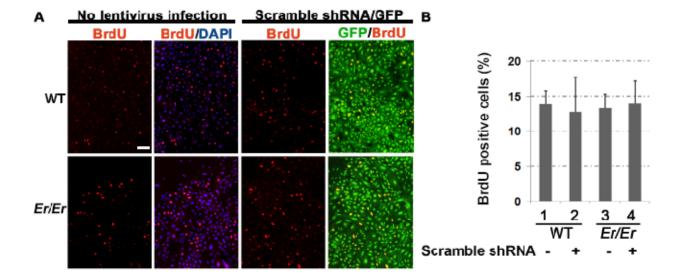
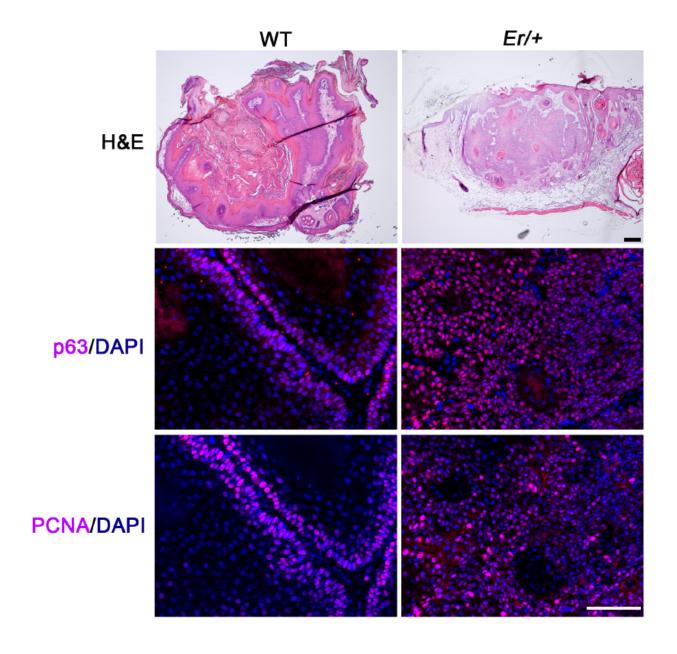
## **Supplementary Materials**



**Fig. S1**. The control scramble shRNA does not affect the WT and *Er/Er* keratinocyte proliferation. (**A**) Primary WT and *Er/Er* keratinocytes were transduced with or without scramble shRNA lentiviruses for 3 days, and then the proliferating cells were labeled by BrdU incorporation and immunostained with anti-BrdU antibody (red). GFP (green) labeled the scramble shRNA lentivirus transduced cells. DAPI (blue) was used for nuclear counterstaining. The scale bar represents 50 μm. (**B**) The percentage of BrdU-positive cells in total either non-transduced cells or transduced GFP positive cells are summarized.



**Fig. S2.** Representative photographs of H&E, immunofluorescence of p63 and PCNA on DMBA/TPA induced WT papillomas and  $\it{Er/+}$  carcinomas (counterstained by DAPI in blue). Scale bars represent 100  $\mu m$ .