



Figure S1 Characterization of BMMSCs from $TERT^{-/-}$ mice. (A) Western blot showed no TERT expression in $TERT^{-/-}$ BMMSCs. Quantitative PCR showed that TERT expression was maintained at relatively a high level from P0 to P2 in WT BMMSCs, these cells were used in this study. However, the expression levels of TERT were significantly decreased in passage 5 and became undetectable in passage 10. On the other hand, TERT expression was undetectable in $TERT^{-/-}$ BMMSCs from p0 to p10. (B) TRAP-ELISA telomere length analysis showed that $TERT^{-/-}$ BMMSCs had no telomerase activity when compared to WT BMMSCs. (C) TERT siRNA significantly knocked down TERT expression, assessed by Western blot. (D) Telomerase activity was significantly decreased in TERT siRNA-treated BMMSCs by TRAP-ELISA telomere length analysis. (E-F) $TERT^{-/-}$ BMMSCs showed downregulation of the osteogenic genes *runx2* and *ocn* (E) and bone nodule formation by alizarin red staining (F). (G-H) *In vitro* adipogenesis evaluation showed that $TERT^{-/-}$ BMMSCs had elevated expression of *pparg2* and *lpl* genes (G), and Oil red-O staining showed that $TERT^{-/-}$ BMMSCs had increased capacity to differentiate into adipocytes (H). Vehicle: scrambled siRNA-treated BMMSCs. Error bars present the s.d. from three independent experiments (** $p < 0.005$, * $p < 0.05$).