



Supplementary Figure S13 | Phenotypic representation and analysis of WT, progeria, and SATI-treated progeria mice. **a** Cumulative plot of body weight of progeria ($n = 5$) and SATI treated progeria (Progeria+SATI) mice ($n = 5$). Data are represented as mean \pm s.e.m. **b** Representative photograph of WT, Progeria, and Progeria + SATI treated spleens at 17 weeks old. Partial rescue of spleen regression is observed in progeria mice upon SATI treatment. **c** Validation of HITI-mediated gene knock-in by PCR using the genomic template from tail-tip fibroblasts (TTFs) isolated from wild-type (WT), Progeria (NT), and SATI-treated progeria (T). TTFs are established at day 70 after IV injection at P1. Genomic DNA harvested from liver of SATI-treated mice at day 100 are used as knock-in control. Blue half-arrows in Supplementary information Fig. S8a are designed PCR primers for detecting HITI. *Fanca* gene is indicated as internal control. **d** Protein level of Lamin A (top band), Progerin (middle band), and Lamin C (bottom band) are detected from cultured TTFs of wild-type (WT), Progeria (NT), and SATI-treated progeria (T). Each band is normalized by Actin density, following Progerin/Lamin A levels are calculated, normalized to NT, and indicated at bottom. **e, f** Phenotypic rescue of nuclear morphological abnormality in fibroblasts isolated from SATI-treated progeria mice. Nuclear morphological abnormality in TTFs isolated from wild-type (WT), Progeria (Pro), and SATI-treated progeria (Pro+SATI) mice at day 70. Immunostaining of LaminA/C (left, **e**), DAPI (middle, **e**), and quantification of morphological abnormality ($n = 6$, **f**). Arrowheads indicate abnormal nuclear morphology. Scale bar, 20 μm (**e**). Data are represented as mean \pm s.e.m., each P value is indicated according to one-way ANOVA with Tukey's multiple comparisons test (**f**). **g** Hematoxylin and eosin (H&E) staining of liver at 17 weeks old mouse. Lower panels are magnified view of the boxed region in upper panel respectively. In the histopathological analysis, no obvious inflammatory features observed around central vein and portal areas of the liver at 17 weeks after systemic AAV injection (Progeria+SATI). Scale bar, (Black) 200 μm , (Blue) 100 μm .