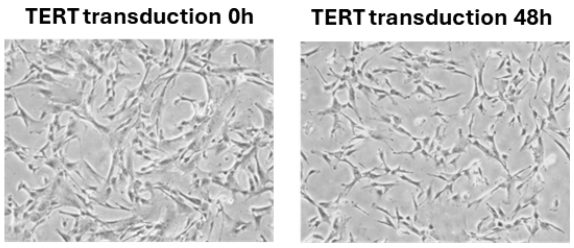
# Supplementary material

A




B

**STR analysis results**

| Reagent | AmpFISTR®Identifiler® KIT | Percent Match | 100 % |
|---|---|---|---|

| Cell name | TERT-MSC at P10 | | CTRL MSC at P6 | |
|---|---|---|---|---|
| Amelogenin | X | X | X | X |
| STR Locus | Allele1 | Allele2 | Allele1 | Allele2 |
| D8S1179 | 14 | 14 | 14 | 14 |
| D21S11 | 30 | 32.2 | 30 | 32.2 |
| D7S820 | 11 | 11 | 11 | 11 |
| CSF1PO | 10 | 14 | 10 | 14 |
| D3S1358 | 15 | 15 | 15 | 15 |
| TH01 | 7 | 9 | 7 | 9 |
| D13S317 | 8 | 10 | 8 | 10 |
| D16S539 | 10 | 11 | 10 | 11 |
| D2S1338 | 19 | 19 | 19 | 19 |
| D5S818 | 10 | 11 | 10 | 11 |
| FGA | 22 | 23 | 22 | 23 |
| D19S433 | 13 | 15.2 | 13 | 15.2 |
| vWA | 14 | 18 | 14 | 18 |
| TPOX | 11 | 12 | 11 | 12 |
| D18S51 | 13 | 19 | 13 | 19 |

| Reagent | AmpFISTR®Identifiler® KIT | Percent Match | 100 % |
|---|---|---|---|

| Cell name | TERT-MSC at P17 | | CTRL MSC at P6 | |
|---|---|---|---|---|
| Amelogenin | X | X | X | X |
| STR Locus | Allele1 | Allele2 | Allele1 | Allele2 |
| D8S1179 | 14 | 14 | 14 | 14 |
| D21S11 | 30 | 32.2 | 30 | 32.2 |
| D7S820 | 11 | 11 | 11 | 11 |
| CSF1PO | 10 | 14 | 10 | 14 |
| D3S1358 | 15 | 15 | 15 | 15 |
| TH01 | 7 | 9 | 7 | 9 |
| D13S317 | 8 | 10 | 8 | 10 |
| D16S539 | 10 | 11 | 10 | 11 |
| D2S1338 | 19 | 19 | 19 | 19 |
| D5S818 | 10 | 11 | 10 | 11 |
| FGA | 22 | 23 | 22 | 23 |
| D19S433 | 13 | 15.2 | 13 | 15.2 |
| vWA | 14 | 18 | 14 | 18 |
| TPOX | 11 | 12 | 11 | 12 |
| D18S51 | 13 | 19 | 13 | 19 |

| Reagent | AmpFISTR®Identifiler® KIT | Percent Match | 100 % |
|---|---|---|---|

| Cell name | TERT-MSC at P20 | | CTRL MSC at P6 | |
|---|---|---|---|---|
| Amelogenin | X | X | X | X |
| STR Locus | Allele1 | Allele2 | Allele1 | Allele2 |
| D8S1179 | 14 | 14 | 14 | 14 |
| D21S11 | 30 | 32.2 | 30 | 32.2 |
| D7S820 | 11 | 11 | 11 | 11 |
| CSF1PO | 10 | 14 | 10 | 14 |
| D3S1358 | 15 | 15 | 15 | 15 |
| TH01 | 7 | 9 | 7 | 9 |
| D13S317 | 8 | 10 | 8 | 10 |
| D16S539 | 10 | 11 | 10 | 11 |
| D2S1338 | 19 | 19 | 19 | 19 |
| D5S818 | 10 | 11 | 10 | 11 |
| FGA | 22 | 23 | 22 | 23 |
| D19S433 | 13 | 15.2 | 13 | 15.2 |
| vWA | 14 | 18 | 14 | 18 |
| TPOX | 11 | 12 | 11 | 12 |
| D18S51 | 13 | 19 | 13 | 19 |

| Reagent | AmpFISTR®Identifiler® KIT | Percent Match | 100 % |
|---|---|---|---|

| Cell name | TERT-MSC at P30 | | CTRL MSC at P6 | |
|---|---|---|---|---|
| Amelogenin | X | X | X | X |
| STR Locus | Allele1 | Allele2 | Allele1 | Allele2 |
| D8S1179 | 14 | 14 | 14 | 14 |
| D21S11 | 30 | 32.2 | 30 | 32.2 |
| D7S820 | 11 | 11 | 11 | 11 |
| CSF1PO | 10 | 14 | 10 | 14 |
| D3S1358 | 15 | 15 | 15 | 15 |
| TH01 | 7 | 9 | 7 | 9 |
| D13S317 | 8 | 10 | 8 | 10 |
| D16S539 | 10 | 11 | 10 | 11 |
| D2S1338 | 19 | 19 | 19 | 19 |
| D5S818 | 10 | 11 | 10 | 11 |
| FGA | 22 | 23 | 22 | 23 |
| D19S433 | 13 | 15.2 | 13 | 15.2 |
| vWA | 14 | 18 | 14 | 18 |
| TPOX | 11 | 12 | 11 | 12 |
| D18S51 | 13 | 19 | 13 | 19 |

**Figure S1. Morphological observations after transduction and genetic concordance between TERT-MSCs and the parental cells (CTRL MSCs).** (A) No abnormal morphological alterations were observed 48 h after transduction under a light microscope (×200 magnification). (B) Short tandem repeat (STR) genotyping confirmed 100% genetic concordance between TERT-MSCs and CTRL MSCs up to passage 30.

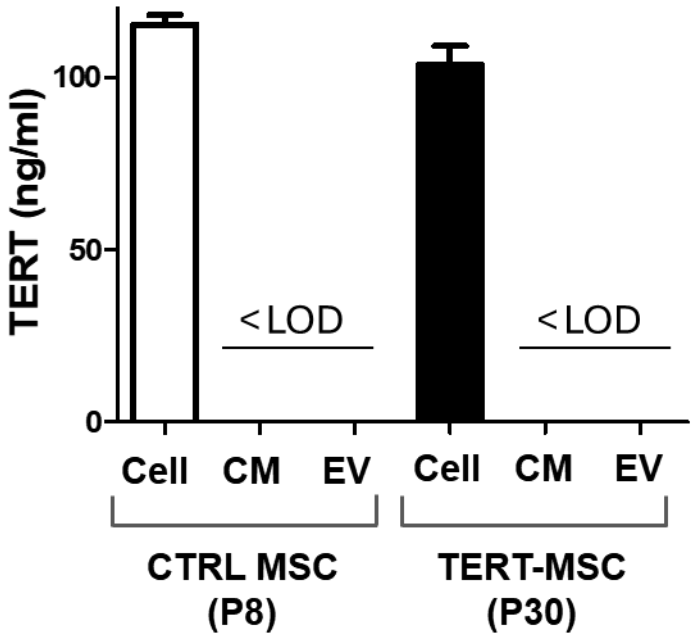



**Figure S2. Quantification of TERT levels in cell lysates, conditioned media (CM), and extracellular vesicles (EVs).** In both CTRL MSCs and TERT-MSCs, TERT protein quantified by ELISA was detected only in cell lysates, but not in CM or EVs. TERT levels in CM and EVs were below the limit of detection (LOD). (n = 3–4 per group)

- **Soft agar colony formation assay in P30 TERT-MSC**

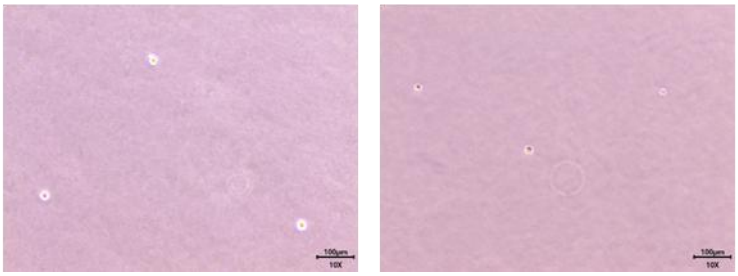


**Figure S3. No tumorigenicity was observed in the soft agar assay after extended culture of TERT-MSCs at P30.** The assay was performed based on the protocol of Borowicz et al [1]. No colony formation was detected in two independent batches of P30 TERT-MSCs. (n = 3 per group)

## Reference

1. Borowicz, S., et al., *The soft agar colony formation assay.* J Vis Exp, 2014(92): p. e51998.