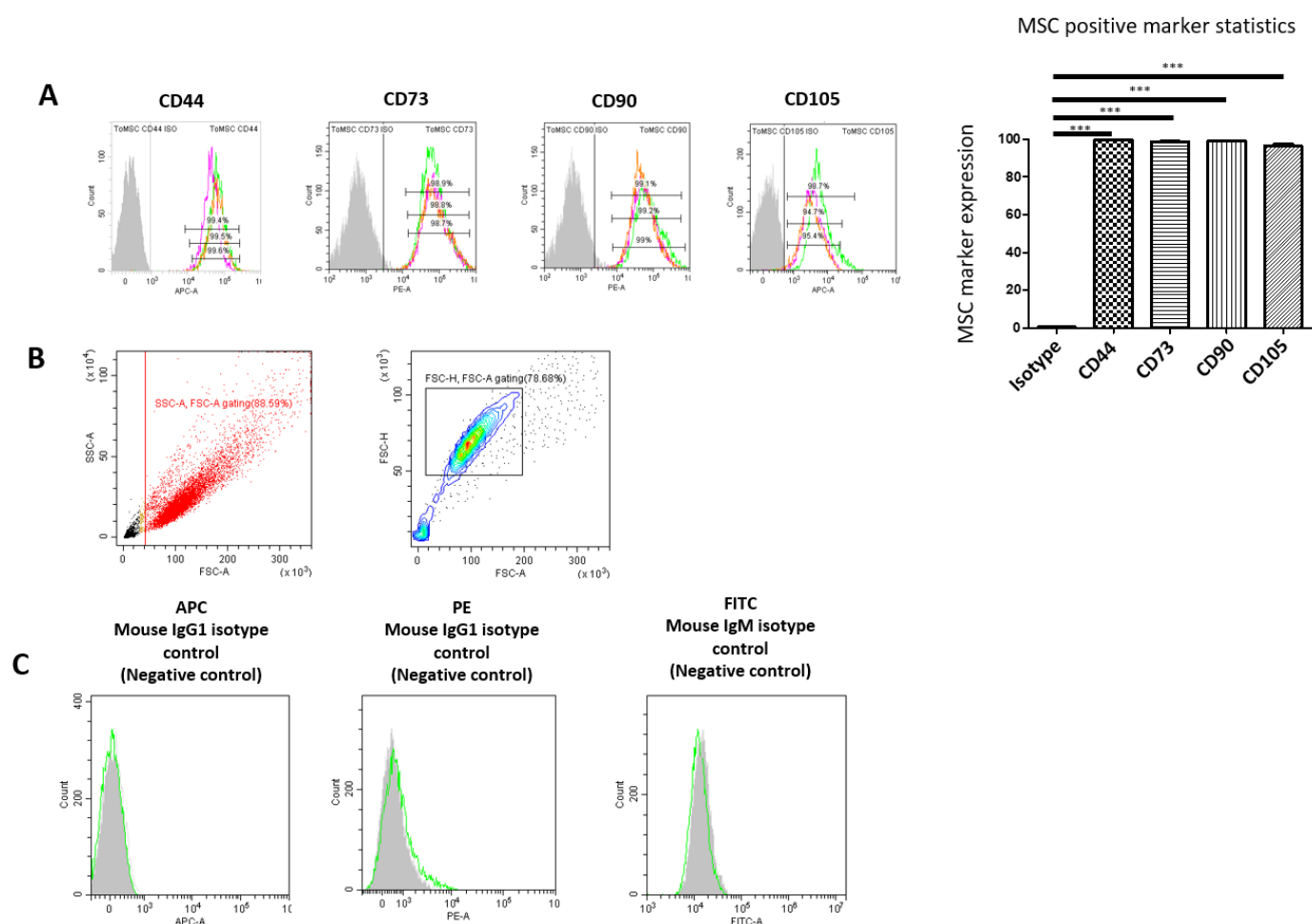
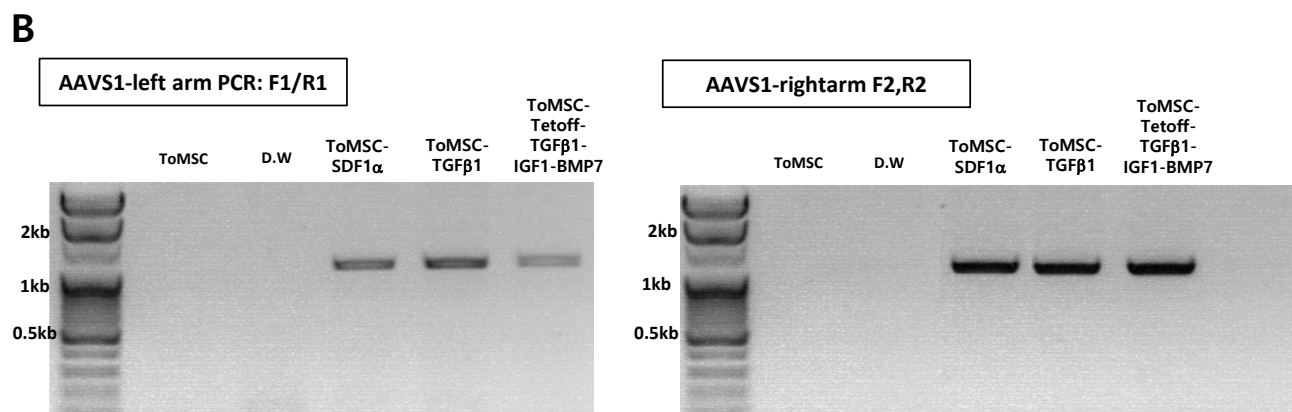


## Supplementary Materials

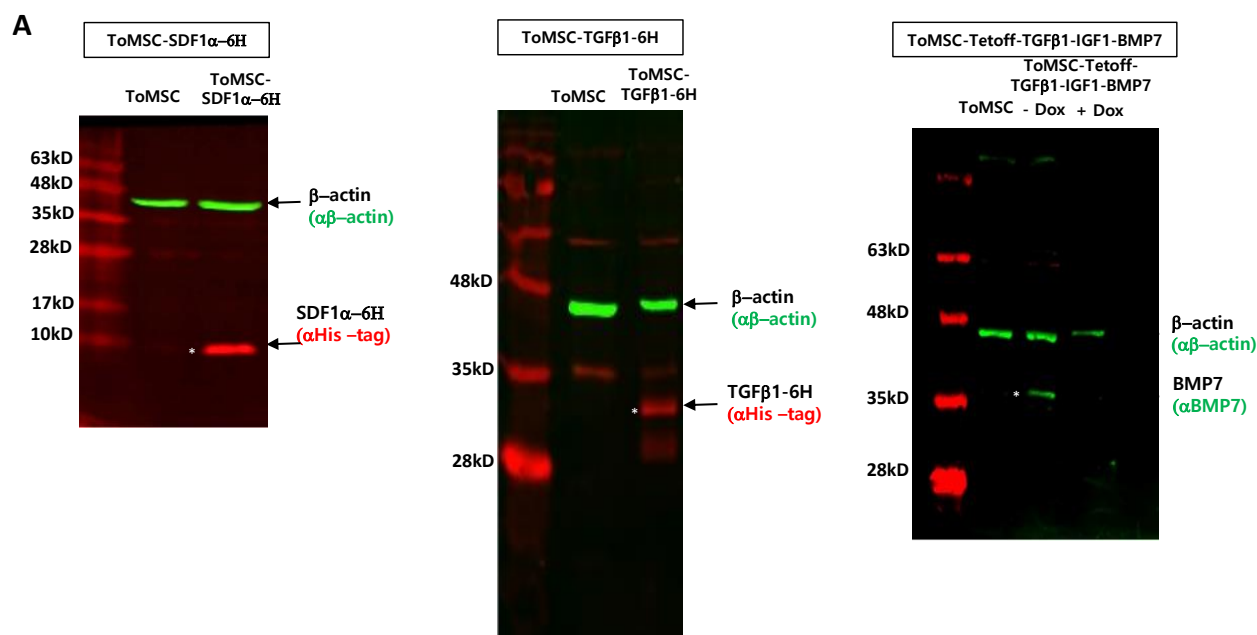


**Figure S1. Flow cytometry statistical processing for ToMSCs and negative controls for antibodies APC, PE, FITC (A)** Flow cytometry statistics MSC marker (CD44, CD73, CD90 and CD105). (B) Flow cytometry analysis gating (SSC-A, FSC-A) and (FSC-H, FSC-A). (C) Flow cytometry analysis of negative control. . \*\*\* $p < 0.001$ , indicating a significant difference between groups as determined by one-way analysis of variance.



**Figure S2. Uncropped gels image of Figure 2B. CRISPR/Cas9-mediated knock-in of transgenes into a safe-harbor site**

(AAVS1) on the ToMSC chromosome.



**Figure S3. Uncropped blots image of figure 3A.** Transgenic expression as evaluated by western blots, immunocytochemistry, and qRT-PCR.

Target	Primer sequence	Size	Annealing temperature (°C)	PCR cycle
AAVS1-left arm PCR	F1: 5'-CCT GAG TCC GGA CCA CTT TGA GC-3' R1: 5'-GAG GAA GAG TTC TTG CAG CTC G-3'	1,163 bp	63	30
AAVS1-right arm PCR	F2: 5'-AAC ATA CGA GCC GGA AGC AT-3' R2: 5'-CGT TGT AAA ACG ACG GCC AG-3'	1,062 bp	63	30
TGFB1	F: 5'-CCC AGC ATC TGC AAA GCT C-3' R: 5'-GTC AAT GTA CAG CTG CCG CA-3'	148 bp	52.1	29
IGF1	F: 5'-TTG CTA AAT CTC ACT GTC ACT GC-3' R: 5'-GCT CCG GAA GCA GCA CT-3'	173 bp	55.1	32
BMP7	F: 5'-GGG CTT CTC CTA CCC CTA CA-3' R: 5'-ACG TCT CAT TGT CGA AGC GT-3'	163 bp	59.1	32
GAPDH	F: 5'-GGG GTG AAC CAT GAG AAG TAT GA-3' R: 5'-GAG TCC TTC CAC GAT ACC AAA G-3'	153 bp	55.1	27

AAVS1-sgRNA	5'-CCCCACAGTGGGGCCACTAG <u>GGG</u> -3'	*PAM sequence was underlined.
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**Table S1.** Sequences of PCR primers and sgRNA used in this study