

**Supplementary Table S1.** Preparation of hAFMSCs trilineage differentiation media

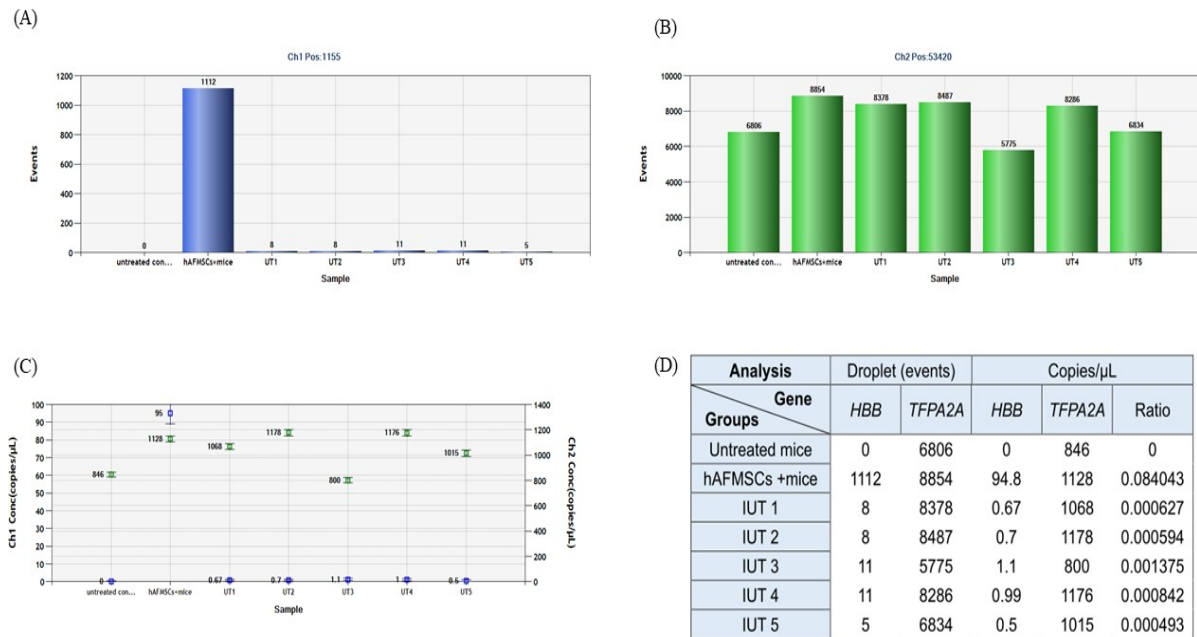
<b>Reagent</b>	<b>Working concentration</b>
<u>Adipogenic differentiation medium</u>	
Dexamethasone	1 $\mu$ M
Insulin	10 $\mu$ g/ml
Isobutylmethylxanthine (IBMX)	0.5 mM
Indomethacin	10 $\mu$ M
Fetal bovine serum (FBS)	10%
Penicillin/Streptomycin (P/S)	1%
<u>Osteogenic differentiation medium</u>	
Dexamethasone	0.1 $\mu$ M
L-ascorbic acid 2-phosphate	0.2 mM
$\beta$ -glycerophosphate	10 mM
Fetal bovine serum (FBS)	10%
Penicillin/Streptomycin (P/S)	1%
<u>Chondrogenic differentiation medium</u>	
Dexamethasone	0.1 $\mu$ M
Insulin	10 $\mu$ g/ml
Transferrin	5.5 $\mu$ g/ml
Sodium selenite	7 ng/ml
L-ascorbic acid 2-phosphate	0.2 mM
Transforming growth factor- $\beta$ 1	10 ng/ml
Fetal bovine serum (FBS)	10%
Penicillin/Streptomycin (P/S)	1%

**Supplementary Table S2.** The information of Taqman probe and primer sequences for PCR and ddPCR used in this study

Gene name	Sequence (5' to 3')	5' Fluorescent reporter	3' Quencher	Tm (°C)	Amplicon size (bp)
<i>HBB</i>	F: 5'- CTGTGTTCACTAGCAACCTC-3' R: 5'- CTGTCTTGTAACCTTGATACCAA-3' P: 5'- ATCCACGTTACACCTTG-3'	VIC	MGB	60	79
<i>TFAP2A</i>	F: 5'- CAATGGGTTTCAGCTGCTTATTG-3' R: 5'- CCCAGGCGTATTTTTGTTCT-3' P: 5'- AATTGCCAAGGGA-3'	FAM	MGB	60	111
<i>FVIII</i>	F: 5'- ACCAGCATGTATGTGAAGGAGTTC-3' R: 5'- CCACAGGTGTGAAGGAGTCTTG-3' P: 5'- AGCAGTCAAGATGGC-3'	FAM	MGB	60	124
<i>β-actin</i>	F: 5'- ACCAGCATGTATGTGAAGGAGTTC-3' R: 5'- CCACAGGTGTGAAGGAGTCTTG-3'			60	143

**Supplementary Table S3.** The information of specify analyses were performed on each mouse in this study

Recipient mice number	Analyses
No.1	aPTT, FVIII activity test, FVIII inhibitor test, ddPCR test
No.2	aPTT, FVIII activity test, FVIII inhibitor test, ddPCR test
No.3	aPTT, FVIII activity test, FVIII inhibitor test
No.4	aPTT, FVIII activity test, FVIII inhibitor test
No.5	aPTT, FVIII activity test, FVIII inhibitor test
No.6	aPTT, FVIII activity test, FVIII inhibitor test
No.7	aPTT, FVIII activity test, FVIII inhibitor test, ddPCR test, Cell fusion test
No.8	aPTT, FVIII activity test, FVIII inhibitor test, ddPCR test, Cell fusion test
No.9	aPTT, FVIII activity test, FVIII inhibitor test, ddPCR test, Cell fusion test



**Supplementary Figure S1.** The droplet events and copy numbers of *HBB* and *TFPA2A* gene amplicons detected by the ddPCR. **(A)** The *HBB* gene droplet events. **(B)** The *TFPA2A* gene droplet events. **(C)** The copy numbers of *HBB* (blue spots) and *TFPA2A* (green spots) calculated by Poisson distribution formula. **(D)** The *HBB* and *TFPA2A* droplet events and copy number ratios.