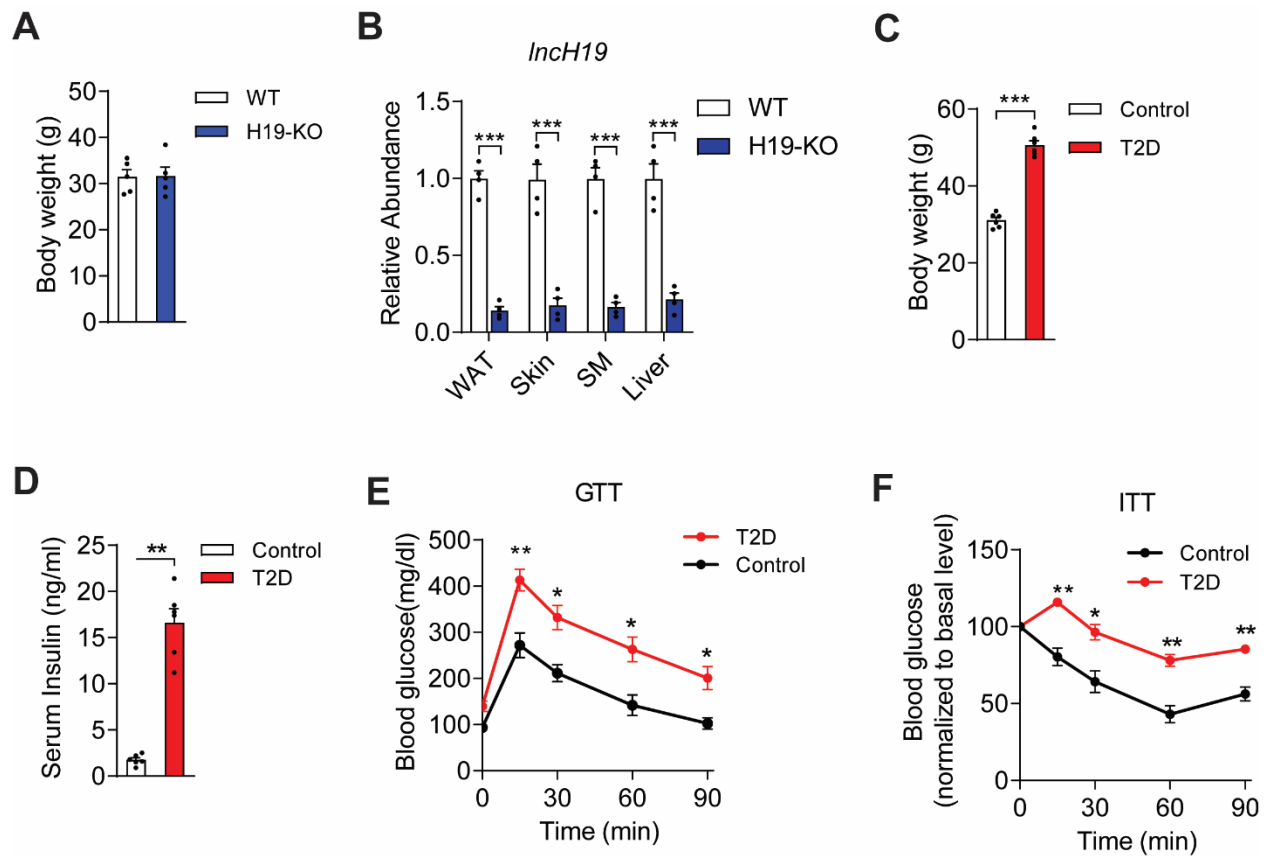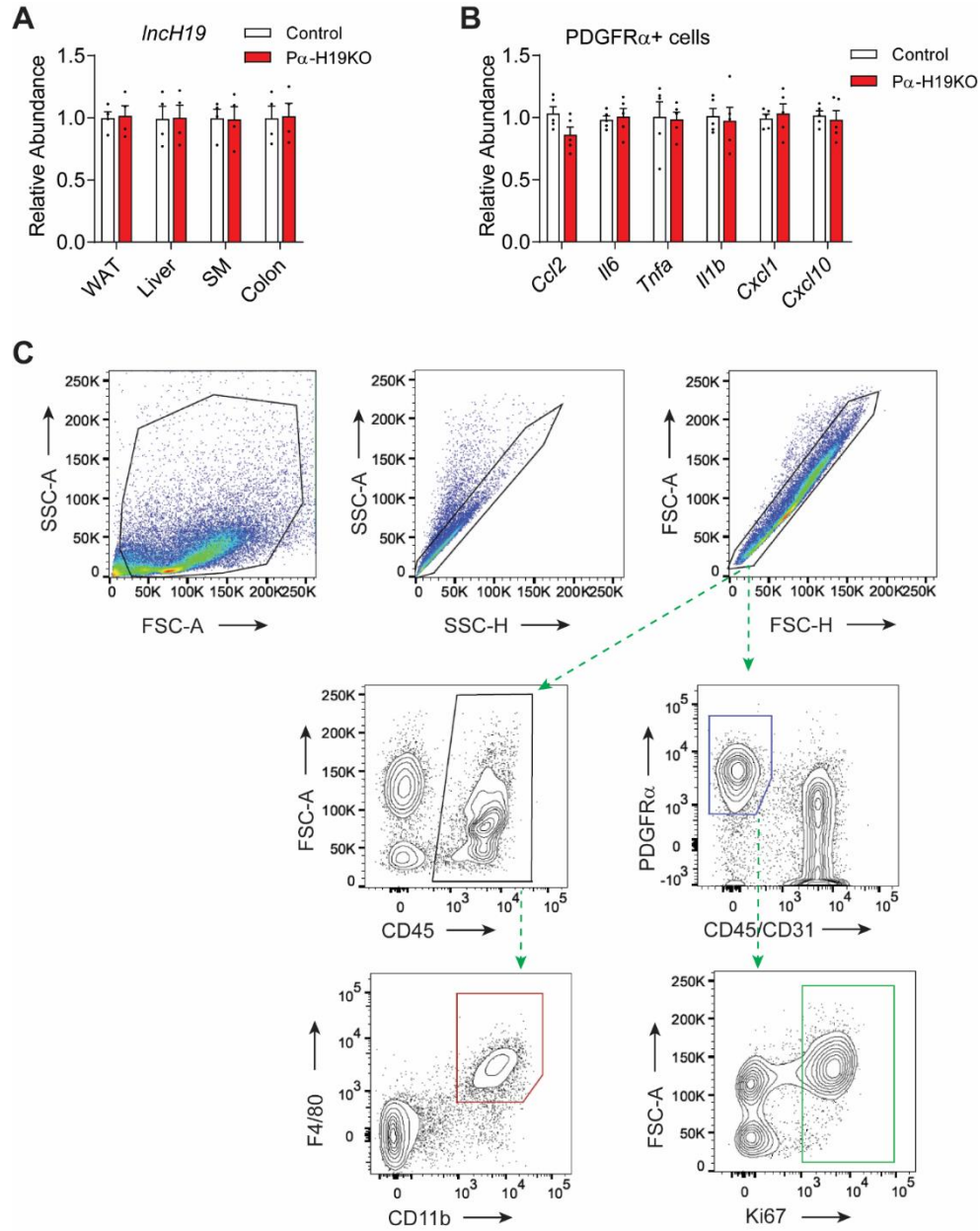# Supplemental Materials

Supplementary Fig. S1. Characterization of type 2 diabetic mice induced by HFD feeding.
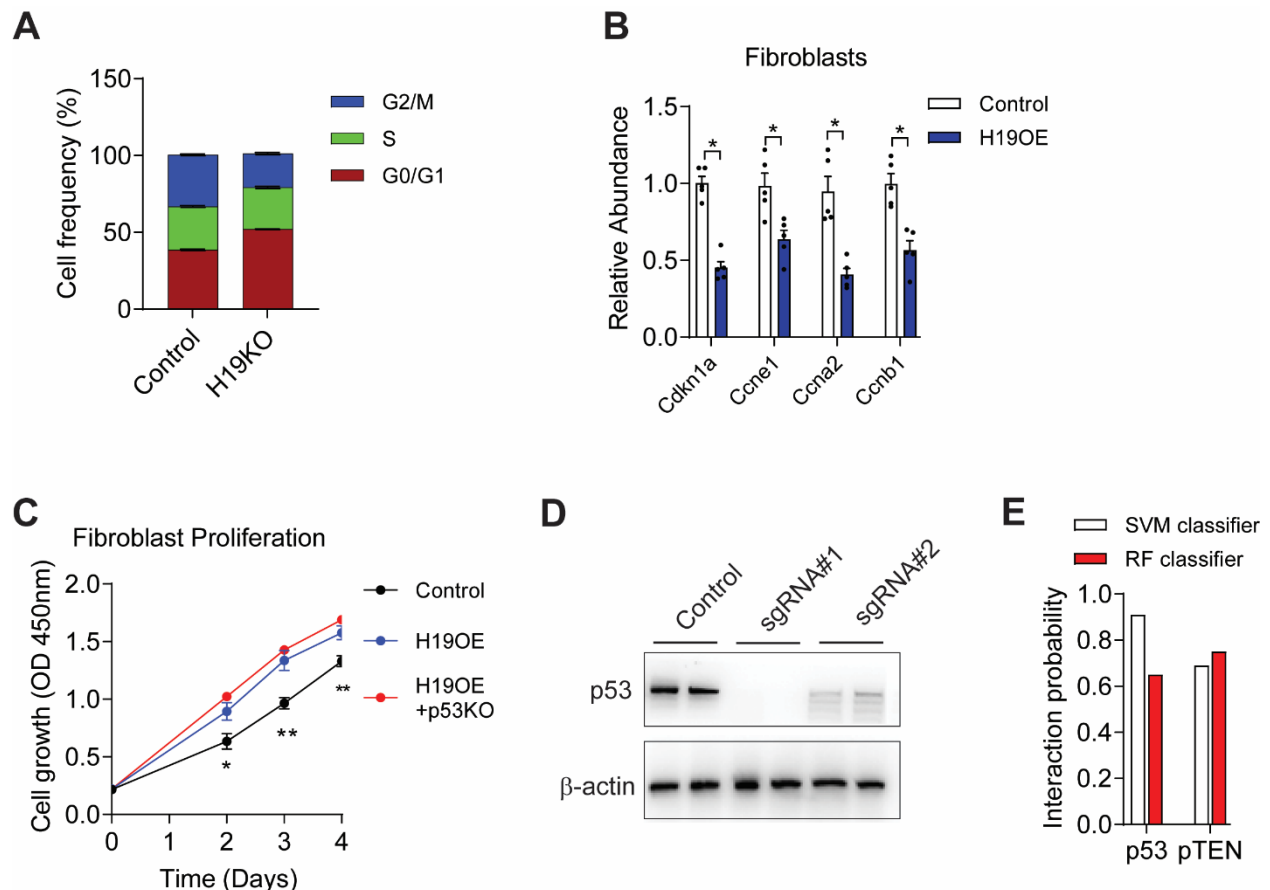
A, Body weight of whole body H19 knockout mice (H19-KO) and wildtype control counterparts at the age of 12 weeks. n=6 for each genotype. **B**, Relative *lncH19* RNA in the tissues of white adipose tissue (WAT), skin, skeletal muscle (SM) and liver from the mice of H19KO or Control. n=4 for each genotype. **C-F**, 8-week-old C57BL/6J mice were maintained on HFD for 12 weeks to induce type 2 diabetes or chow diet (CD) for Control animals as described in Figure 1D. n=6 for each group. **C**, Body weight of T2D and control animals. **D**, Serum insulin levels of 4hr-fasting mice were determined by ELISA. **E**, Glucose tolerance test (GTT). **F**, Insulin tolerance test (ITT). All data are shown as mean ± SD. *, $p < 0.05$ **, $p < 0.01$ or ***, $p < 0.001$ by two-tailed unpaired Student's *t*-test.

Supplementary Fig. S2. Related to Figure 2.

A, Relative *lncH19* RNA in the tissues of WAT, Liver, SM and Colon from the mice of Pα-H19KO or Control. n=4 mice for each genotype. **B**, Relative mRNA levels of pro-inflammatory genes in PDGFRα+ cells freshly sorted from wound-healing cutaneous tissues of Pα-H19KO and control animals, respectively. n=5 mice for each genotype. All data are shown as mean ± SD. **C**, Gating strategy for the detection and quantification of macrophages and Ki67+ PDGFRα+ cells in
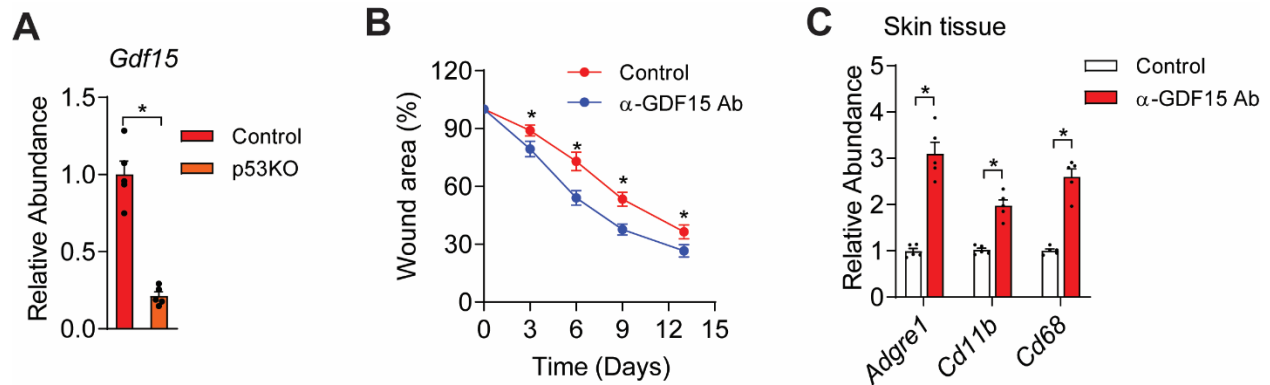
cutaneous tissue by flow cytometry. Upon selection of live cells/single cells from stromal vascular fraction of cutaneous tissue, CD45+ cells were segregated on the basis of CD11b and F4/80 expression for macrophages. Or CD45-CD31-PDGFRα+ cells were separated on the basis of Ki67 expression.

Supplementary Fig. S3. Overexpression of *lncH19* promotes fibroblast proliferation via repressing p53 activity. (Related to Figure 3)
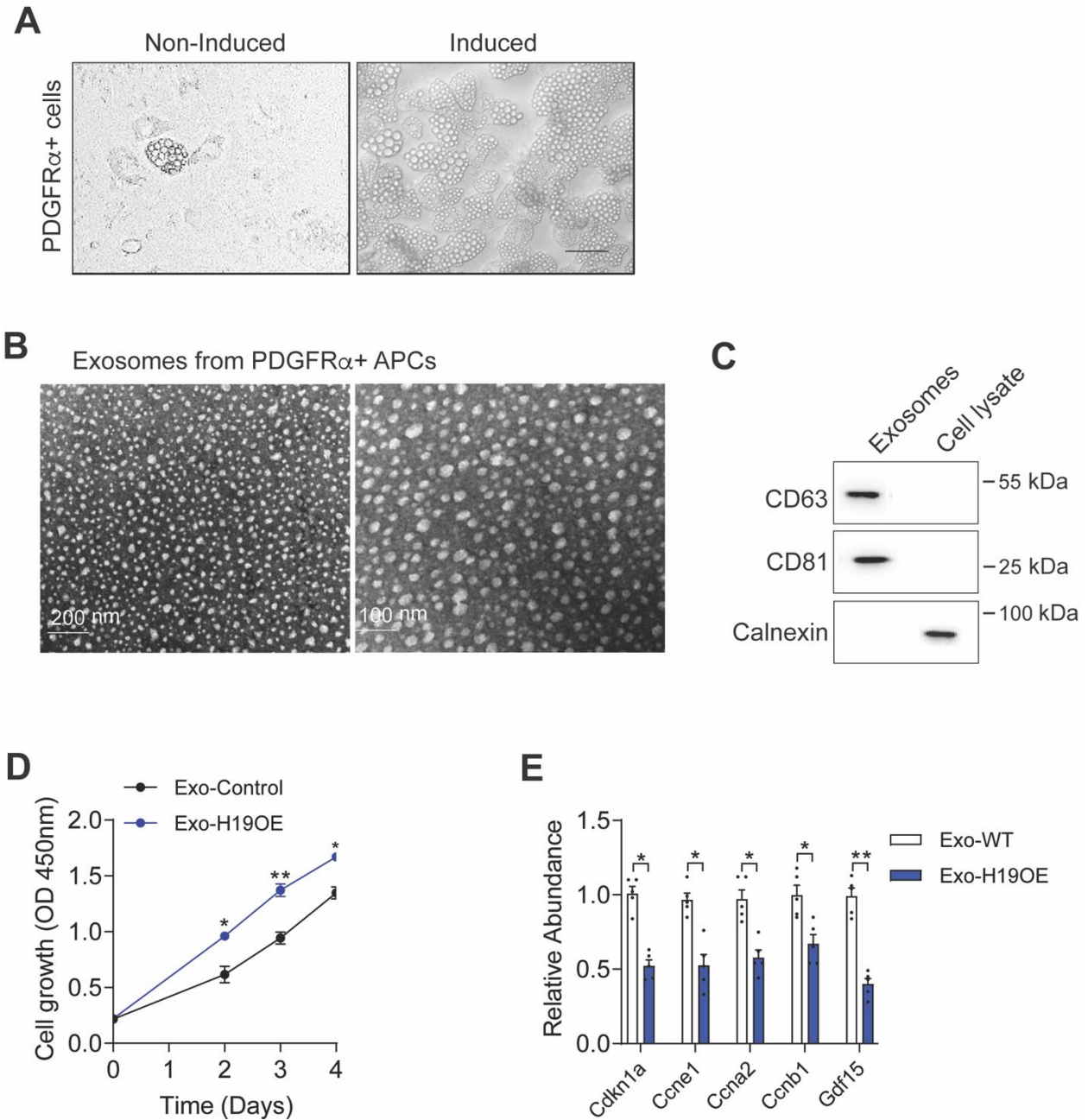
A, Cell cycle of fibroblasts of H19KO and control animals were determined by flow cytometry. Quantification of cell percentages of G0/G1, S and G2 phases were presented. **B**, Relative mRNA levels of p53-target genes in primary dermis fibroblasts transfected with lentivirus expressing *H19*. **C**, CCK8 assays determined the growth of dermis fibroblasts *in vitro* after the transfection with lentivirus expression *lncH19* or in combination of lentivirus expressing *p53* gRNA as indicated. **D**, Immunoblotting of *p53* protein levels in fibroblasts which were transfected by lentivirus expressing gRNA#1, gRNA#2 of p53 or control. **E**, Bioinformatics prediction of lncH19-interacting p53 and pTEN proteins. RPISeq predictions were based on random forest (RF) or

support vector machine (SVM). For A-D, the data are shown as mean $\pm$ SD. *, $p < 0.05$ **, $p < 0.01$ or ***, $p < 0.001$ by two-tailed unpaired Student's t-test.

Supplementary Fig. S4. Related to Figure 4.

A, Relative *Gdf15* mRNA levels in primary H19-KO fibroblasts which were prior transfected with lentivirus expressing gRNA of p53 or control. **B**, Wound area of diabetic mice were measured at indicated time points. The mice were administered with α-GDF15 Ab (10mg per kg body weight once every two days) at the second day after injury. n=5 for each genotype. **C**, Relative mRNA levels of macrophage-selective marker genes in wound-healing cutaneous tissues of Pα-H19KO mice which were treated by α-GDF15 Ab (5mg per kg body weight once every day) at the second day after injury. (n=5 each genotype). All the data are shown as mean ± SD. *, $p < 0.05$ **, $p < 0.01$ by two-tailed unpaired Student's *t*-test.

Supplementary Fig. S5. Characterization of scWAT APC-derived exosomes and exosomes derived from H19-overexpressed APCs promote the proliferation of dermis fibroblasts.

A, Representative brightfield images of PDGFRα+ Sca1+ APCs from scWAT maintained in ordinary growth media (Non-induced) or adipogenesis-induced media (Induced) for 8 days. Scar bar is 20 μm. **B**, Representative images of the ultrastructure of APC-derived exosomes by

transmission electron microscopy. Scar bar is 200nm for the left image and 100nm for the right image. **C**, Immunoblotting analyses of the exosome makers (CD63, CD81) and intracellular protein marker (Calnexin) in the samples of exosomes and cell lysate. **D**, CCK8 assays determined the growth of dermis fibroblasts *in vitro* in the presence of indicated exosomes. **E**, Relative mRNA levels of p53-target genes in primary dermis fibroblasts with the presence of indicated exosomes. For **D,E**, exosomes were isolated form the APCs which were prior transfected with lentivirus expressing *lncH19* or control. The data are shown as mean ± SD. *, $p < 0.05$ **, $p < 0.01$ by two-tailed unpaired Student's *t*-test.

Supplemental Table 1. Primer sequences.

	Gene	Forward (5' -3')	Reverse (5' -3')
		Primer sequences for qPCR	
	Ccl2	CCACAACCACCTCAAGCACTTC	AAGGCATCACAGTCCGAGTCAC
	lncH19	GTCCGGCCTTCCTGAACACCTT	GCTTCACCTTCCAGAGCCGAT
	Il1b	GCAACTGTTCCTGAACTCAACT	ATCTTTTGGGGTCCGTCAACT
	Il6	AAGCCAGAGTCCTTCAGAGAGA	ACTCCTTCTGTGACTCCAGCTT
	Rps18	CATGCAAACCCACGACAGTA	CCTCACGCAGCTTGTTGTCTA
	Tnfa	GAAAGGGGATTATGGCTCAGG	TCACTGTCCCAGCATCTTGTG
	U1	GGGAGATACCATGATCAC GAAGGT	CCACAAATTATGCAGT CGAGTTTCCC
Mouse	*Mrc1*	GTTCACCTGGAGTGATGG TTCTC	AGGACATGCCAGGGTC ACCTTT
	Il10	CGGGAAGACAATAACTG CACCC	CGGTTAGCAGTATGTT GTCCAGC
	Adgre1	ATGGACAAACCAACTTTCAAGGC	GCAGACTGAGTTAGGACCACAA
	Cd11b	CCATGACCTTCCAAGAGAATGC	ACCGGCTTGTGCTGTAGTC
	Cd68	CCATCCTTCACGATGACACCT	GGCAGGGTTATGAGTGACAGTT
	Gdf15	CTGGCAATGCCTGAACAACG	GGTCGGGACTTGGTTCTGAG
	p53	CTCTCCCCCGCAAAAGAAAA	CGGAACATCTCGAAGCGTTTA
	Cdkn1a	CCTGGTGATGTCCGACCTG	CCATGAGCGCATCGCAATC
	Ccne1	GTGGCTCCGACCTTTCAGTC	CACAGTCTTGTCAATCTTGGCA
	Ccna2	GCCTTCACCATTCATGTGGAT	TTGCTGCGGGTAAAGAGACAG
	Ccnb1	AAGGTGCCTGTGTGTGAACC	GTCAGCCCCATCATCTGCG
	hLNCH19	GACATCTGGAGTCTGGCAGG	CTGCCACGTCCTGTAACCAA
Human	hP53	CAGCACATGACGGAGGTTGT	TCATCCAAATACTCCACACGC
	hRPS18	GCGGCGGAAAATAGCCTTTG	GATCACACGTTCCACCTCATC