

Figure S1. Overexpressing *Sp5* is able to maintain mESC self-renewal

(A) Western blot analysis of the protein level of FLAG in three different mESC colonies overexpressing *Flag-tagged Sp5* (PB-Sp5). (B) AP staining images of PB and PB-Sp5 colonies cultured in serum condition for 7 days in the absence of LIF. (C) qRT-PCR analysis of gene expression in PB and PB-Sp5 mESCs cultured in serum condition for 7 days. Pluripotency genes: *Oct4*, *Nanog* and *Rex1*. Differentiation genes: *Cdx2*, *Nestin*, *Gata4* and *Mixl1*. (D) Representative images of PB and PB-Sp5 OCRG9 ESCs cultured in serum condition for 10 days in the absence of LIF. (E) qRT-PCR analysis of gene expression in PB and PB-Sp5 OCRG9 ESCs cultured in serum condition for 10 days without LIF. Pluripotency genes: *Oct4*, *Nanog* and *Rex1*, differentiation genes: *Cdx2*, *Nestin*, *T* and *Gata6*. Data represent mean \pm s.d. of three biological replicates. * $p < 0.05$, ** $p < 0.01$ vs PB. Scale bar, 100 μ m. c1, c2 and c3 are the individual colonies of *Sp5*-overexpressing mESC.

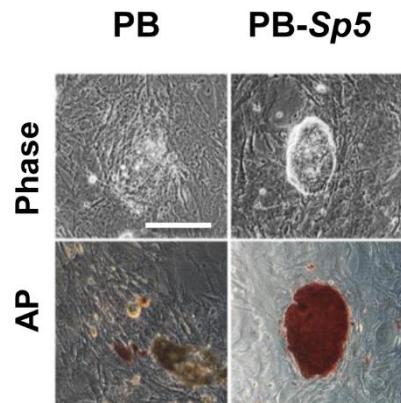


Figure S2. *Sp5* enables *Stat3*-null ESCs in an undifferentiated state

Morphology and alkaline phosphatase staining of *Stat3*-null ESCs transfected with empty or *Sp5* vector and cultured in serum condition without LIF for two passages. Scale bars, 100 μ m.

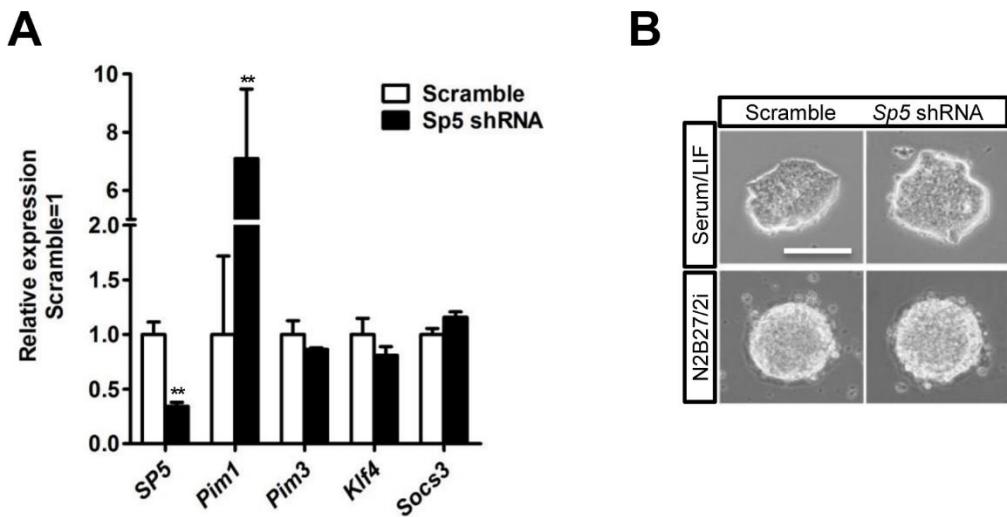


Figure S3. *Sp5* is redundant in LIF-mediated self-renewal.

(A) qRT-PCR analysis of *Sp5*, *Pim1*, *Pim3*, *Klf4* and *Socs3* expression in scramble control or *Sp5* shRNAs 46C mESCs. (B) Morphology of scramble and *Sp5* shRNA expressed 46C mESCs cultured in Serum/LIF and N2B27/2i respectively for five passages. Data represent mean \pm s.d. of three biological replicates. ** p < 0.01 vs scramble. Scale bars, 100 μ m.

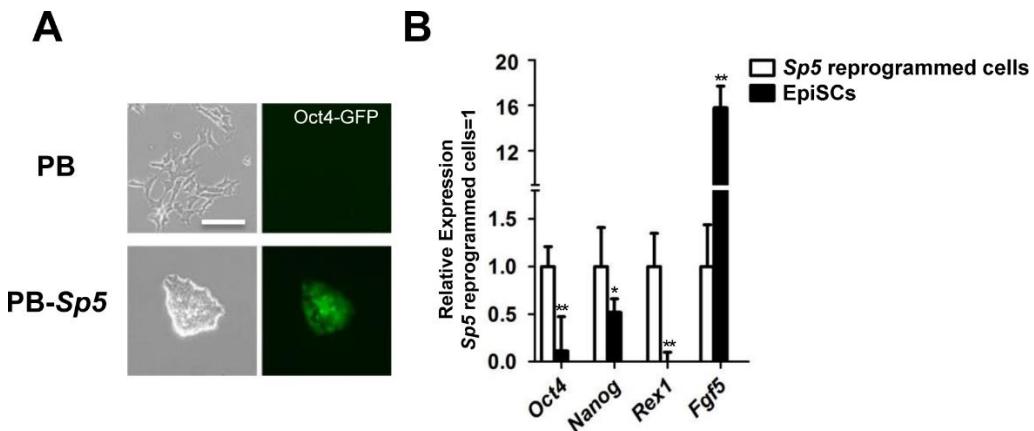


Figure S4. Forced expression of *Sp5* facilitates reprogramming of EpiSCs into naïve state ESCs

(A) Representative pictures of a Oct4-GFP colony emerged after 15 days of reprogramming (bottom) generated after PB-*Sp5* transfection. (B) qRT-PCR analysis of gene expression in EpiSCs and *Sp5*-reprogrammed cells cultured in 2i/LIF. ESCs pluripotency markers: *Oct4*, *Nanog* and *Rex1*, EpiSC markers: *Oct4* and *Fgf5*. *p < 0.05, **p < 0.01 vs *Sp5* reprogrammed cells. Scale bar, 100 μ m.

Supplemental Table

Table S1. List of primers used for qRT-PCR analysis

Gene	Forward sequence(5'-3')	Reverse sequence(5'-3')
<i>Gapdh</i>	TGTGAGGGAGATGCTCAGTG	TGTTCCTACCCCCAATGTGT
<i>Sp5</i>	TCCAGACCAACAAACACACCA	AGTTTGCCTACCCAATCA
<i>Lef1</i>	TCACTGTCAAGCGACACTTC	TGAGGCTTCACGTGCATTAG
<i>Tcf1</i>	ATCCTTGATGCTGGGATCTG	CTTCTCTGCCTGGGTTCTG
<i>Tcf4</i>	TGGACATTGACATTGCATT	CACACGGTCAGTCCATGTT
<i>Oct4</i>	GAAGCAGAACAGAGGATCACCTG	TTCTTAAGGCTGAGCTGCAAG
<i>Nanog</i>	TCCAGAACAGGGCGTCAGAT	CAAATCCCAGCAACCACATG
<i>Rex1</i>	TCACTGTGCTGCCTCCAAGT	GGGCACTGATCCGCAAAC
<i>Stella</i>	TTCCGAGCTAGCTTGAGG	ACACCGGGTTAGGGTTAG
<i>Fgf5</i>	GCAGCCCACGGGTCAA	CGGTTGCTCGGACTGCTT
<i>Socs3</i>	ATTCACCCAGGTGGCTACAG	GCCAATGTCTTCCCAGTGTT
<i>Pim1</i>	GCCCTCCTTGAAGAAATCC	GGACCTGGAGTCTGGAATGA
<i>Pim3</i>	AGCAGTGACCTCTGACCCCT	TCAAGTATCCACCCAGGGCA
<i>Klf4</i>	CGAACTCACACAGGCGAGAA	CGGAGCGGGCGAATT
<i>Cdx2</i>	ACCGGAATTGTTGCTGCTGT	TCCCGACTTCCCTTCACCAT
<i>Nestin</i>	CTCGAGCAGGAAGTGGTAGG	TTGGGACCAGGGACTGTTAG
<i>Mixl1</i>	TTGAATTGAACCCTGTTGTCCC	GAAACCCGTTCTCCATCCACC
<i>Gsc</i>	CTCGGAGGAGTCAGAAAACG	CAGTCCTGGCCTGTACATT
<i>Gata4</i>	TCTCACTATGGGCACAGCAG	GCGATGTCTGAGTGACAGGA
<i>Gata6</i>	TCCTCCCTGCCGAAGTC	AGGGCCAGAGCACACCAA
<i>Sox17</i>	AGCCATTCCCTCCGTGGTGT	AACACTGCTTCTGGCCCTCAG