

Table S1. Sequences of qRT-PCR primers used for iPSC characterization

Gene Name	Forward primer sequence	Reverse primer sequence
<i>Pou5f1</i>	ACATCGCCAATCAGCTTGG	AGAACCATACTCGAACCACATCC
<i>Sox2</i>	TAGAGCTAGACTCCGGGCGATGA	TTGCCTTAAACAAGACCACGAAA
<i>Nanog</i>	GCTCCGCTCCATAACTTCGG	TTGTGGGGTGCTAAAATGCG
<i>Klf4</i>	GCACACCTGCGAACTCACAC	CCGTCCCAGTCACAGTGGTAA
<i>Gapdh</i>	CTCGTCCCGTAGACAAAATGG	ATCTCCACTTTGCCACTGCAA

Table S2. Sequences of qRT-PCR primers used for PGCLC validation

Gene Name	Forward primer sequence	Reverse primer sequence
<i>Pou5f1</i>	ACATCGCCAATCAGCTTGG	AGAACCATACTCGAACCACATCC
<i>Sox2</i>	TAGAGCTAGACTCCGGGCGATGA	TTGCCTTAAACAAGACCACGAAA
<i>Nanog</i>	GCTCCGCTCCATAACTTCGG	TTGTGGGGTGCTAAAATGCG
<i>Fgf5</i>	TACGTGGCCCTGAACAAGAG	TGGAACAGTGACGGTGAAGG
<i>Dnmt3b</i>	GCTTTGCTTCACTGGGTCTC	AACTGATGGGGTACTGACGC
<i>Wnt3</i>	CCTGGACCACATGCACCTAAA	CGGAGGCACTGTCGTACTTG
<i>Dazl</i>	GCAGAGAACCTTTGTACCCAC	TAGCAAGGTGCTGTTCCAGTG
<i>Dnd1</i>	AATGGGTTAAGCAGAGCCTGT	AGGGCAAGGTTTCCTCACAAC
<i>Dppa3</i>	CCGTACCTGTGGAGAACAAGA	TAGGGTCTTTCAGCACCGAC
<i>Itgb3</i>	ACGGGACTTTTGAGTGTGGG	GCTGAGAGGGTCGGTAATCC
<i>Nanos3</i>	CACTACGGCCTAGGAGCTTGG	TGATCGCTGACAAGACTGTGG
<i>Prdm1</i>	GAAAAATGGGAGCCCCGACA	AAGACGGAAGGGGACTGTGA
<i>Prdm14</i>	ACAGCCAAGCAATTTGCACTAC	TTACCTGGCATTTCATTGCTC
<i>Tfap2c</i>	AGGCATCTCATTTCTGCGGG	CACGGACAGGCTTAGAGGTC
<i>Gusβ</i>	GCAGCCCTTCGGGACTTTAT	TCCTCAACACCACTCTCATGTC

Table S3. Lists of DEGs up- or down-regulated in both iPSCs and their corresponding source cell type

Group	DEGs up-regulated in both iPSCs and source cells	DEGs down-regulated in both iPSCs and source cells
MEFs	2510022D24Rik ¹ , <i>Aig1</i> , <i>Arhgef2</i> ² , <i>Csnk1e</i> , <i>Ddx3y</i> , <i>Fhl3</i> , <i>Fmn1</i> , <i>Frmd6</i> , <i>Gm10653</i> , <i>Gm31458</i> ³ , <i>Gm8618</i> , <i>Hpcall</i> , <i>Klhdc2</i> , <i>Lpp</i> , <i>Myof</i> , <i>Reep1</i> , <i>Smim3</i> , <i>Zfp800</i> , <i>Zswim6</i>	<i>1110018N20Rik</i> ⁴ , <i>Ahcy</i> ⁵ , <i>Cacna1a</i> , <i>Ccl25</i> , <i>Ccnblip1</i> , <i>Cdhr1</i> , <i>Cep44</i> , <i>Comm1d1</i> , <i>Cops7a</i> , <i>Crxos</i> ⁶ , <i>Dhx38</i> , <i>Dnmt3l</i> , <i>Dpys</i> , <i>Dynlt1a</i> , <i>Etv6</i> , <i>Fam25c</i> , <i>Gadd45gip1</i> , <i>Get3</i> , <i>Gm10499</i> , <i>Gm13778</i> , <i>Gm21283</i> , <i>Gm40493</i> , <i>Gm4737</i> , <i>Gm6402</i> , <i>Gm8909</i> , <i>Gt(ROSA)26Sor</i> , <i>Hsd17b14</i> , <i>Kbtbd11</i> , <i>Lefty1</i> , <i>LOC118568154</i> , <i>LOC118568782</i> , <i>Lsm4</i> , <i>Lsm8</i> , <i>Mnd1-ps</i> , <i>Nek2</i> , <i>Nob1</i> , <i>Olig1</i> , <i>Olig2</i> , <i>Pgpep1l</i> , <i>Platr26</i> , <i>Plbd1</i> , <i>Plp2</i> , <i>Pmaip1</i> , <i>Polr2k</i> , <i>Rai1</i> , <i>Rfxank</i> , <i>Sbds</i> , <i>Slc20a2</i> , <i>Slc27a2</i> , <i>Spire2</i> , <i>Taf5l</i> , <i>Tm4sf5</i> , <i>Tmem17</i> , <i>Tomm40</i> , <i>Trdmt1</i> , <i>Tubb3</i> , <i>Ubd</i> , <i>Yars2</i>
TTFs	<i>Arhgef2</i> , <i>Arrb1</i> , <i>Atp6v0c-ps2</i> , <i>Ddx3y</i> , <i>Fhl3</i> , <i>Fmn1</i> , <i>Frmd6</i> , <i>Gm31458</i> , <i>Gm8618</i> , <i>H2ac19</i> , <i>Hpcall</i> , <i>Klhdc2</i> , <i>Mindy2</i> , <i>Myof</i> , <i>Nlr1</i> , <i>Pitpnc1</i> , <i>S100a13</i> , <i>Zfp942</i>	<i>1110018N20Rik</i> , <i>2210409E12Rik</i> , <i>Atp5j</i> , <i>Atp6v1b2</i> , <i>Cacna1a</i> , <i>Car2</i> , <i>Cars2</i> , <i>Castor1</i> , <i>Ccl25</i> , <i>Ccnblip1</i> , <i>Cdhr1</i> , <i>Cep44</i> , <i>Cherp</i> , <i>Cklf</i> , <i>Comm1d1</i> , <i>Cops7a</i> , <i>Crxos</i> , <i>Dnmt3l</i> , <i>Dpys</i> , <i>Dynlt1a</i> , <i>E2f4</i> , <i>Fam25c</i> , <i>Fbxl14</i> , <i>Gadd45gip1</i> , <i>Get3</i> , <i>Gm10499</i> , <i>Gm12338</i> , <i>Gm13778</i> , <i>Gm22767</i> , <i>Gm24289</i> , <i>Gm25776</i> , <i>Gm31349</i> , <i>Gm40847</i> , <i>Gm4737</i> , <i>Gm5848</i> , <i>Gm6360</i> , <i>Gm6402</i> , <i>Gm8909</i> , <i>Gt(ROSA)26Sor</i> , <i>Gtpbp3</i> , <i>Hsd17b14</i> , <i>Isynal</i> , <i>Jam2</i> , <i>Kbtbd11</i> , <i>Khdc3</i> , <i>Klf16</i> , <i>Lefty1</i> , <i>LOC115488690</i> , <i>LOC115490496</i> , <i>LOC118568154</i> , <i>LOC118568782</i> , <i>Lsm4</i> , <i>Lsm6</i> , <i>Lsm8</i> , <i>Miip</i> , <i>Msc</i> , <i>Mtal</i> , <i>Nob1</i> , <i>Nop2</i> , <i>Nr2c2ap</i> , <i>n-R5s111</i> , <i>Olig1</i> , <i>Olig2</i> , <i>Pabpc4</i> , <i>Pdf</i> , <i>Pet100</i> , <i>Pglyrp1</i> , <i>Pgpep1l</i> , <i>Phb2</i> , <i>Pigg</i> , <i>Platr26</i> , <i>Plp2</i> , <i>Pmaip1</i> , <i>Polr2k</i> , <i>Prr19</i> , <i>Raver1</i> , <i>Ruvbl2</i> , <i>Sbds</i> , <i>Serpinb9b</i> , <i>Sf3b5</i> , <i>Snora33</i> , <i>Snora44</i> , <i>Spindoc</i> , <i>Spire2</i> , <i>Srebfl</i> , <i>Taf5l</i> , <i>Tmem17</i> , <i>Tomm40</i> , <i>Trdmt1</i> , <i>Trmt1</i> , <i>Tubb3</i> , <i>Ubd</i> , <i>Utf1</i> , <i>Yars2</i> , <i>Zfp869</i>
PGCs	<i>Atp2b4</i> , 2510022D24Rik, <i>Akap17a</i> , <i>Btg1</i> , <i>Eif2s3y</i> , <i>Fzd3</i> , <i>Gm26225</i> , <i>Gm31458</i> , <i>Gm32885</i> , <i>Gm40003</i> ⁷ , <i>Hdgfl3</i> , <i>Hpcall</i> , <i>Klhdc2</i> , <i>Lrrc18</i> , <i>Timm8a2</i> , <i>Tmem108</i> , <i>Ube2q2</i> , <i>Uty</i> , <i>Xlr3a</i> , <i>Xlr3c</i> , <i>Xlr4a</i> , <i>Xlr4b</i>	<i>Ccnblip1</i> , <i>Crxos</i> , <i>Fam25c</i> , <i>Fanca</i> , <i>Gm10499</i> , <i>Gm13778</i> , <i>Gm8909</i> , <i>Gt(ROSA)26Sor</i> , <i>Kbtbd11</i> , <i>Lefty1</i> , <i>LOC118568782</i> , <i>Pcsk9</i> , <i>Tmem17</i> , <i>Ubd</i>
SSCs	<i>Egln3</i> , <i>Gm10653</i> , <i>Gm12643</i> , <i>Gm26760</i> , <i>Gm40003</i> , <i>Timm8a2</i> , <i>Tnp1</i> , <i>Uty</i>	<i>2300002M23Rik</i> , <i>Asph</i> , <i>Bag3</i> , <i>Crxos</i> , <i>Dpys</i> , <i>Fam25c</i> , <i>Gm10499</i> , <i>Gm13778</i> , <i>Gm6109</i> , <i>Gm8909</i> , <i>Got2</i> , <i>Kbtbd11</i> , <i>Lefty1</i> , <i>LOC118568782</i> , <i>Msc</i> , <i>Pdf</i> , <i>Tmem17</i> , <i>Ubd</i>

¹ Genes labeled in black are up-regulated DEGs unique in each group.

² Genes labeled in blue are up-regulated DEGs common between both MEF and TTF groups.

³ Genes labeled in orange are up-regulated DEGs common between both MEF, TTF, and PGC groups.

⁴ Genes labeled in green are down-regulated DEGs common between both MEF and TTF groups.

⁵ Genes labeled in brown are down-regulated DEGs unique in each group.

⁶ Genes labeled in red are down-regulated DEGs common in all four groups.

⁷ Genes labeled in purple are up-regulated DEGs common between both PGC and SSC groups.

Table S4. Source cell-type specific DEGs detected in iPSCs and transmitted to corresponding PGCLCs

Source cells	Type of DEGs	Potential inheritance of transcriptional memory from source cells detected in iPSCs	Potential inheritance of transcriptional memory from iPSCs detected in PGCLCs
MEFs	Up-regulated DEGs	<i>2510022D24Rik, Aigl, Arhgef2, Csnk1e, Ddx3y, Fhl3, Fmn1, Frmd6, Gm10653, Gm31458, Gm8618, Hpcall, Klhdc2, Lpp, Myof, Reep1, Smim3, Zfp800, Zswim6</i>	<i>Arhgef2</i>
	Down-regulated DEGs	<i>Lefty1, Nek2, Trdmt1, Platr26, Gm13778, Slc27a2, Ahcy, 1110018N20Rik, LOC118568782, Sbds, Lsm8, Gt(ROSA)26Sor, Cops7a, Etv6, Plbd1, Crxos, Tomm40, Hsd17b14, Pgpep1l, Ccl25, Kbtbd11, Slc20a2, Gm40493, Cep44, Rfxank, Lsm4, Cacna1a, Gadd45gip1, Get3, Nob1, Dhx38, Gm21283, Spire2, Tubb3, Taf5l, Dnmt3l, Tmem17, Commd1, Rail, Tm4sf5, Mnd1-ps, Fam25c, Cdhr1, Ccnblip1, LOC118568154, Polr2k, Dpys, Yars2, Gm4737, Olig2, Olig1, Dynlt1a, Gm6402, Gm10499, Gm8909, Ubd, Pmaip1, Plp2</i>	<i>Dynlt1a</i>
TTFs	Up-regulated DEGs	<i>Arhgef2, Arrb1, Atp6v0c-ps2, Ddx3y, Fhl3, Fmn1, Frmd6, Gm31458, Gm8618, H2ac19, Hpcall, Klhdc2, Mindy2, Myof, Nlr1, Pitpnc1, S100a13, Zfp942</i>	<i>S100a13</i>
	Down-regulated DEGs	<i>Msc, Gm31349, Lefty1, Trdmt1, Platr26, Gm13778, 1110018N20Rik, Car2, Gm5848, Pabpc4, Snora44, Gm22767, Miip, LOC118568782, Pigg, Sbds, Lsm8, Gt(ROSA)26Sor, Fbxl14, Phb2, LOC115490496, Cops7a, Nop2, Crxos, Pglyrp1, Tomm40, Prr19, Ruvbl2, Hsd17b14, Pgpep1l, Utl1, Pet100, Ccl25, Cars2, Kbtbd11, Cep44, Atp6v1b2, Zfp869, Nr2c2ap, Isynal, Lsm4, Gtpbp3, Cherp, Gm6360, Lsm6, Cacna1a, Trmt1, Gadd45gip1, Get3, Cklf, E2f4, Pdf, Nob1, Spire2, Tubb3, n-R5s111, Taf5l, Raver1, Gm24289, Khdc3, Sf3b5, Snora33, Dnmt3l, Klfl6, Castor1, Tmem17, Commd1, Srebf1, Gm12338, 2210409E12Rik, Gm40847, Gm25776, Mtal, Serpinb9b, Fam25c, Cdhr1, Ccnblip1, LOC118568154, Polr2k, Dpys, Yars2, LOC115488690, Gm4737, Jam2, Atp5j, Olig2, Olig1, Dynlt1a, Gm6402, Gm10499, Gm8909, Ubd, Pmaip1, Spindoc, Plp2</i>	<i>Dynlt1a, Gadd45gip1, Gm12338, Khdc3, Lsm8, Pmaip1, Prr19, Taf5l</i>
PGCs	Up-regulated DEGs	<i>Atp2b4, Gm40003, Hdgfl3, Ube2q2, Tmem108, Btg1, Hpcall, Klhdc2, Lrrc18, Gm26225, Fzd3, Timm8a2, Gm31458, Gm32885, Xlr4a, Xlr3a, Xlr4b, Xlr3c, 2510022D24Rik, Akap17a, Eif2s3y, Uty</i>	N/A*
	Down-regulated DEGs	<i>Ccnblip1, Crxos, Fam25c, Fanca, Gm10499, Gm13778, Gm8909, Gt(ROSA)26Sor, Kbtbd11, Lefty1, LOC118568782, Pcsk9, Tmem17, Ubd</i>	N/A
SSCs	Up-regulated DEGs	<i>Egln3, Gm10653, Gm12643, Gm26760, Gm40003, Timm8a2, Tnp1, Uty</i>	<i>Egln3</i>

	Down-regulated DEGs	<i>2300002M23Rik, Asph, Bag3, Crxos, Dpys, Fam25c, Gm10499, Gm13778, Gm6109, Gm8909, Got2, Kbtbd11, Lefty1, LOC118568782, Msc, Pdf, Tmem17, Ubd</i>	N/A
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*No genes found.