doi:10.1038/nature20104

Supplementary Figure 1 - Source data of gel electrophoresis

Figure 3d

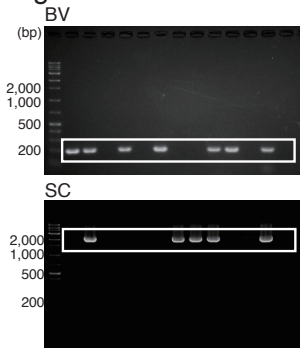


Figure 3d

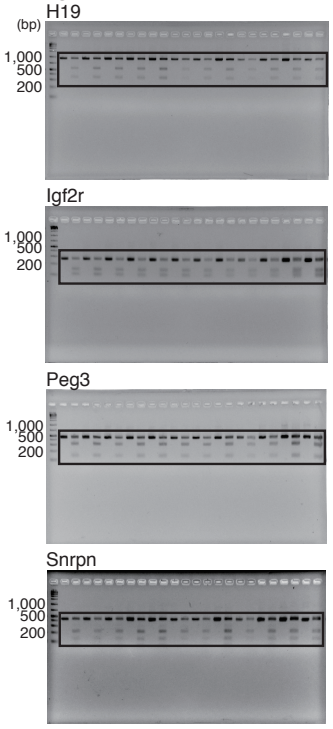


Figure 3i

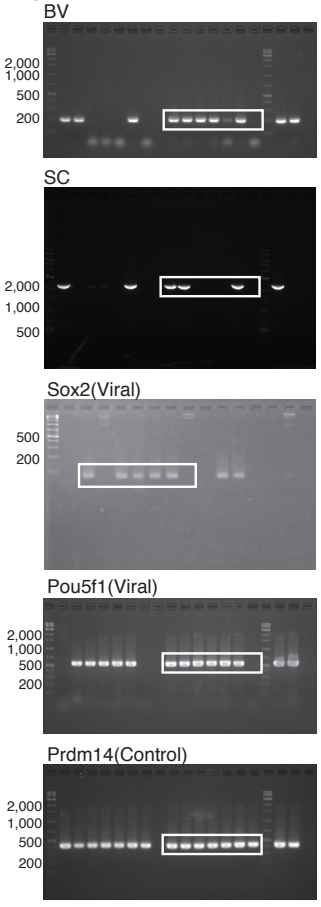
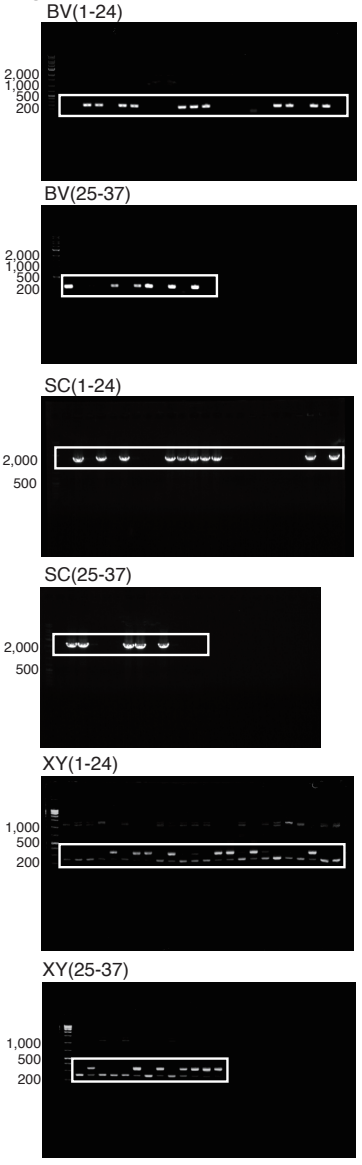
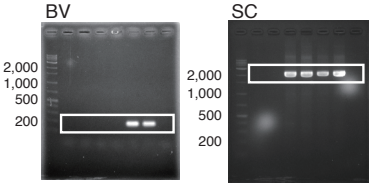


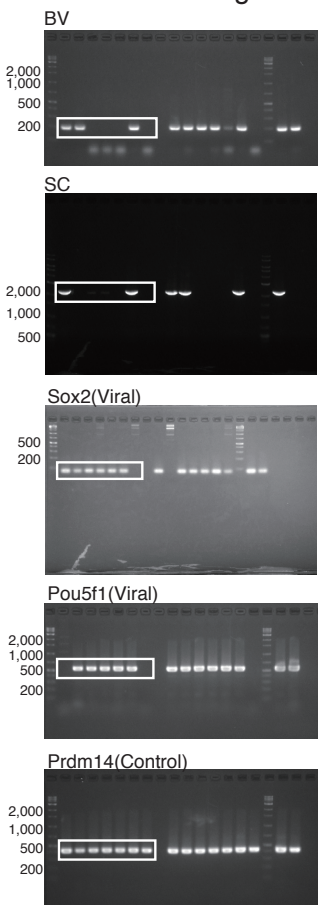
Figure 4c



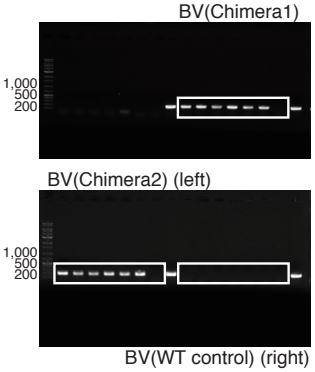
Extended Data Figure 3c



Extended Data Figure 3d



Extended Data Figure 9b



Supplementary Table 1. Genes differentially expressed between MII oocytes *in vitro* and *in vivo*

Gene category (in Figure 2e)	Gene Symbols
Category 1	Abhd12, Acot13, Adipor1, Aes, Aip, Akap1, Aldh2, Aldh7a1, Aldoa, Anapc13, Anxa6, Asb8, Asna1, Asnsd1, Atp5e, Atp5j Atp6v1e1, Atp9a, Atpif1, Aven, Bag1, Birc5, Cacnb3, Calm2, Calr, Camk2g, Capns1, Ccdc92, Ccm2, Ccni, Cd9, Cdipt Cdk11b, Cdk5, Cenpq, Cetn2, Cfl1, Chchd2, Cirh1a, Cisd1, Ckb, Clptm1, Copz1, Cox17, Cox4i1, Cox6a1, Cst3, Cyb5r3 Ddx41, Derl3, Dgcr6, Dgkz, Dlgap4, Dppa5a, E430025E21Rik, Edf1, Eif3g, Eif4h, Emc10, Ensa, Ergic3, Fam134a, Fam189b Fam89b, Farp1, Fbxo5, Fdft1, Flot2, Foxm1, Frg1, Ftl1, Fxr2, Fzr1, Ganab, Gfra4, Gga3, Gm15772, Gm1673, Gm6792,Gnas Gpaa1, Grcc10, Grina, Gtf2h1, Hint1, Hn1, Hras, Hsp90b1, Hspa5, Igbp1, Isca1, Kat8, Klhdc3, Lamtor1, Lamtor5, Lgals1 Lhfpl2, Lpin2, Lrch4, Lsm10, Lsm4, Lyar, Map1lc3a, Mapk3, Mast2, Mcee, Mdh2, Mecr, Men1, Micu2, Mkrn1, Mrpl28, Mrpl30 Mrpl33, Mrps18c, Mrps24, Mrps6, Mtch1, Mtfr1l, Mtx2, Naa38, Napa, Ncln, Ndufa1, Ndufa11, Ndufa2, Ndufa3, Ndufa5, Ndufa7 Ndufb9, Ndufc1, Ndufs2, Nomo1, Nploc4, Nucb1, Nudt9, Nusap1, Ost4, Paip2, Pcbd2, Pdlim7, Pebp1, Phpt1, Pigq, Pigs, Pkm Pld3, Ppdpf, Prkag1, Prpsap1, Psmb4, Psmb7, Puf60, Rab1b, Rfx2, Rhot2, Rims3, Rpl7, Rsl24d1, Sbf1, Sdf4, Sdhd, Sec23ip Sh3bgrl3, Sh3glb2, Slc25a1, Slc25a4, Slc35b1, Slc35c2, Slc39a6, Smap1, Smg5, Smim12, Snapc5, Snrnp25, Sqstm1, Ssr2 Ssr4, Sssca1, Stub1, Stx5a, Sympk, Tacc3, Tbc1d10b, Tcea3, Tceb2, Tecr, Timm17b, Tmem147, Tmem183a, Tmem50a Tmem63b, Tmsb10, Tomm6, Trappc2l, Tsc22d4, Txndc12, Ubap2, Ube2a, Ube2m, Ubxn6, Uqcr10, Uqcr11, Usp14, Vamp8 Vps4a, Wdtc1, Ybx2, Yipf1, Yipf3, Zcrb1, 1110008P14Rik, 1810055G02Rik, 2010107E04Rik
Category 2	Al848285, Arg2, B4galt2, Bfsp1, Cd7, Cltb, Cpsf4l, Cyp4f39, Dnmt3l, E330017A01Rik, Enpp5, Fmnl3, Gm15698, Gm813 Gstm5, Gtsf1, Ldhb, Me1, Miox, Ndrg4, Necap2, Ninj2, Nos1, Npm2, Oas1c, Ooep, Padi6, Paip2b, Pdlim2, Pgs1, Pinlyp Reep2, Rimkla, Scg3, Sgsm1, Smpd1, Speer5-ps1, Tcn2, Tubb2a, Tubb2a-ps2, Tubb2b, Zp1, Zp2, Zp3, 7420461P10Rik
Category 3	Abcb6, Ada, Agpat9, Amz2, Ano10, Atp6v0e2, B930041F14Rik, C1qtnf5, Car9, Ccdc3, Cd52, Cd63, Cdc25b, Cipc, Cldn25 Cln6, Cox4i2, Cstb, Cyr61, Dync1i1, Extl1, Fam174b, Fam219a, Fam25c, Fbxw9, Fetub, Fuca1, Fxyd6, Glmn, Gm11837 Gm364, Gm7120, Gm9999, Htra1, Hyal2, Igfbp4, Igfbp7, Il34, Inha, Itfg3, Itm2c, Krt79, Lama5, Ldha, Lrrc75a, Lsm6, Ly6a Mettl7a1, Mettl7a2, Mkks, Mnd1, Ndufa4l2, Ngfrap1, Nmb, Nme5, Nr1d1, Nr2e1, Nudt19, Plxnb2, Pomgnt1, Ppap2c, Ppapdc3 Procr, Ptgds, Rab11fip5, Ralgds, Rfng, S100a4, S100a6, Samd10, Serpinb12, Slc10a3-ubl4, Slc25a23, Slc25a35, Slc27a2 Slc37a4, Smim19, Smim8, Sparc, Spint1, Stk32a, Stk32c, Tagln2, Thbs1, Tmed3, Tmem159, Tmem169, Tmem180, Tmem29 Tmem8, Tmem86a, Tmsb4x, Tnfrsf12a, Uggt2, Vim, Vps9d1, Wdr83os, Xpa, Zdhhc16, Zdhhc4, Znrd1, 0610031J06Rik 0610040F04Rik, 1110007C09Rik
Category 4	Aldh4a1, Alg8, Aurkc, Cgn, Crabp2, Ctnna1, Dpy19l3, Fam221a, Gm13152, Hmgn3, Lamc1, Manba, Map3k4, Mga, Ndufaf2 Pdxdc1, S100a14, Scaf4, Tuba3b, Zcchc14, Zfp710
Category 5	Adam8, Adra1b, Arhgef26, Btc, Cep135, Cth, Cxcr3, Ece1, Edar, Flt1, Fmo4, Gm1653, Gpd2, Htr7, Mamdc2, Mars2, Mmp24 Msi2, Mterf1a, Ncs1, Olfr1349, Olfr877, Plac1, Plek, Rad51ap2, Rasal2, Rerg, Slc19a2, Slc26a5, Slc39a8, Sox8, Tmem132b Tmem181b-ps, Tmem181c-ps, Utrn. 1700042B14Rik. 1810041L15Rik. 3110057O12Rik. 4921506M07Rik, 4921517D22Rik

Supplementary Table 2. Primers used in this study

Primer name	Sequence
Bisulfite sequence (Oocytes)	
Igf2r Outer-5	TTAGTGGGGTATTTTTATTTGTATGG
Igf2r Inner-5	GTGTGGTATTTTTATGTATAGTTAGG
Igf2r Outer/Inner-3	AAATATCCTAAAAATACAAACTACAC
H19 Outer-5	GAGTATTTAGGAGGTATAAGAATT
H19 Outer-3	ATCAAAAACTAACATAAACCCCT
H19 Inner-5	GTAAGGAGATTATGTTTATTTTTGG
H19 Inner-3	CCTCATTAATCCCATAACTAT
Peg3 Outer-5	TGATAATAGTAGTTTGATTGGTAGGG
Peg3 Inner-5	TTTTGTAGAGGATTTTGATAAGGAGG
Peg3 Outer-3	TAATTCACACCTAAAACCCTAAAACC
Peg3 Inner-5	AAATACCACTTTAAATCCCTATCACC
Snrpn Outer-5	TATGTAATATGATATAGTTTAGAAATTAG
Snrpn Inner-5	AATTTGTGTGATGTTTGTAATTATTTGG
Snrpn Outer-3	AATAAACCCAAATCTAAAATATTTTAATC
Snrpn Inner-3	ATAAAATACACTTTCACTACTAAAATCC
COBRA analysis and Bisulfite sequence (Offspring)	
H19 COBRA-5	GGAATATTTGTGTTTTTGGAGGG
H19 COBRA-3	TTAAACCCCAACCTCTACTTTTATAAC
Igf2r COBRA-5	TTAGTGGGGTATTTTTATTTGTATGG
Igf2r COBRA-3	AAATATCCTAAAAATACAAACTACAC
Peg3 COBRA-5	TTGATAATAGTAGTTTGATTGGTAGGGTGT
Peg3 COBRA-3	ATCTACAACCTTATCAATTACCCTTAAAAA
Snrpn COBRA-5	AATTTGTGTGATGTTTGTAATTATTTGG
Snrpn COBRA-3	ATAAAATACACTTTCACTACTAAAATCC
Genotyping	
Blimp1-mVenus-5	ACTCATCTCAGAAGAGGATCTG
Blimp1-mVenus-3	CACAGTCGAGGCTGATCTCG
Stella-CFP-5	CGAGCTAGCTTTTGAGGCTT
Stella-CFP-3	AACTTGTGGCCGTTTACGTC
Prdm14 WT-5	AAGGTTCTGGGAACTGGATGTC
Prdm14 WT-3	CACAATATGCTGGCATGCGTTC
Sox2 viral-5	TTAAGGATCCCAGTGTGGTGGTA
Sox2 viral-3	TTCAGCTCCGTCTCCATCATG
Pou5f1 viral-5	CATCCTCTAGACTGCCGGATCT
Pou5f1 viral-3	TGCTTCAGCAGCTTGGCAAACTGT
Ubel-5 (for sexing)	TGGATGGTGTGGCCAATGCYCT
Ubel-3 (for sexing)	CCACCTGCACGTTGCCCTTKGTGCCCAG