# Small molecule/ML327 mediated transcriptional de-repression of Ecadherin and inhibition of epithelial-to-mesenchymal transition

**Supplementary Material and Methods** 

Chemistry: Probe preparation



*tert*-Butyl (3-(5-phenylisoxazole-3-carboxamido)propyl)carbamate: To a solution containing 1.0 g (5.29 mmol) of 3-phenylisoxazole-3-carboyxlic acid and 0.89 g (5.56 mmol) of *tert*-butyl (3-aminopropyl)carbamate in 10mL of DMF was added 2.5 g (5.82 mmol) of (1-Cyano-2-ethoxy-2- oxoethylidenaminooxy)dimethylamino-morpholino-carbenium hexafluorophosphate (COMU), followed by 2.0 mL (11.1 mmol) of diisopropylethyl amine (DIPEA). The reaction mixture was allowed to stir at room temperature overnight. The solvents were removed under reduced pressure and the residue was subjected to silica gel chromatography to give 1.55g (85%) of *tert*- butyl (3-(5-phenylisoxazole-3-carboxamido)propyl)carbamate as a yellow solid: : >98% pure by liquid chromatography mass spectrometer (LCMS) at 214 nM; Electrospray ionization (ESI) m/z = 290.2 [M – C4Ha]<sup>+</sup>.

N-(3-Aminopropyl)-5-phenylisoxazole-3-carboxamide: A mixture containing 1.5 g

(4.35 mmol) of *tert*-butyl (3-(5-phenylisoxazole-3-carboxamido)propyl)carbamate, 50 mL of dichloromethane (DCM), and 10 mL of a 4.0M solution of HCl in dioxane was allowed to stir at room temperature for 1 hour. The solvents were removed under reduced pressure to give 1.22 g (100%) of *N*-(3-aminopropyl)-5-phenylisoxazole-3-carboxamide, which was used with no further purification: > 95% pure by LCMS at 254 nM; (ESI) m/z = 246.30 [M + H]<sup>+</sup>.

*N*-(3-(2-Hydroxynicotinamido)propyl)-5-phenylisoxazole-3-carboxamide (ML327): To a solution containing 0.3 g (0.278 mmol) of *N*-(3-aminopropyl)-5-phenylisoxazole-3carboxamide hydrochloride salt, 0.156 g (1.12 mmol) of 2-hydroxynicotinic acid, and 5 mL of DMF was added 0.50 g (1.17 mmol) of COMU followed by 289 μL (1.6 mmol) of DIPEA. The reaction mixture was allowed to stir at room temperature for 2 hours. The solvents were removed under reduced pressure. The residue was subjected HPLC purification to give 92 mg (25%) of *N*-(3-(2- hydroxynicotinamido)propyl)-5phenylisoxazole-3-carboxamide as a white solid: >95% pure by LCMS at 214nM; <sup>1</sup>H NMR (400MHz, d<sup>6</sup>-DMSO): δ 9.81 (t, 1H, *J* = 6 Hz), 8.87, (t, 1H, *J* = 5.6 Hz), 8.32 (dd, 1H, *J* = 7.2, 2 Hz), 7.93-7.91 (m, 2H), 7.69-7.67 (m, 1H), 7.56-7.53 (m, 3H), 7.34 (s, 1H), 6.45 (t, 1H, *J* = 13.2 Hz), 3.37-3.28 (m, 4H), and 1.77-1.73, m, 2H); <sup>13</sup>C NMR (125MHz, d<sup>6</sup>-DMSO): δ 170.7, 163.8, 132.6, 160.1, 158.8, 144.3, 139.7, 131.2, 129.7, 126.7, 126.2, 120.8, 106.6, 100.3, 37.1, 36.6, and 29.6. HRMS calcd for C<sub>18</sub>H<sub>18</sub>N<sub>5</sub>O<sub>2</sub>: 366.1461, found 366.1464.



*tert*-Butyl (2-(5-phenyl-1*H*-pyrazole-3-carboxamido)ethyl)carbamate: To a solution containing 0.5 g (2.66 mmol) of 5-phenyl-1*H*-pyrazole-3-carboxylic acid, 0.45 g (2.79 mmol) of *tert*-butyl (2-aminoethyl)carbamate, and 10 mL of THF was added 1.2 g (2.92 mmol) of COMU followed by 720  $\mu$ L (3.99 mmol) of DIPEA. The reaction mixture was allowed to stir at room temperature overnight. The solvents were removed under reduced pressure and the residue was subjected to silica gel chromatography to give 380mg (43%) of *tert*-butyl (2-(5-phenyl-1*H*- pyrazole-3-carboxamido)ethyl)carbamate as a white solid, >98% pure by LCMS at 214nM, <sup>1</sup>H- NMR (400 MHz, CD<sub>3</sub>OD):  $\delta$  7.70 (d, *J* = 6.1 Hz, 2H), 7.45 (t, *J* = 6.7 Hz, 2H), 7.39-7.36 (m, 1H),7.02 (s, 1H), 3.46 (t, *J* = 6.0 Hz, 2H), 3.28 (t, *J* = 6.2 Hz, 2H), 1.42 (s, 9H); (ESI) *m*/*z* = 331.2 [M+ H]<sup>+</sup>.

*N*-(2-Aminoethyl)-5-phenyl-1*H*-pyrazole-3-carboxamide trifluoroacetate: A solution containing 0.380 g (1.15 mmol) of *tert*-butyl (2-(5-phenyl-1*H*-pyrazole-3-carboxamido)ethyl)carbamate, 10 mL of DCM, and ~3 mL of TFA was allowed to stir at room temperature for 6 hours. The solvents were removed under reduced pressure to give a white solid, which was used without additional purification: >96 % pure by LCMS at 214nM, (ESI) m/z= 231.30 [M + H]<sup>+</sup>.

### N-(2-(5-Phenyl-1 H-pyrazole-3-carboxamido)ethyl)isonicotinamide

trifluoroacetate (266Y): To a solution containing 0.1 g (0.29 mmol) of N-(2-aminoethyl)-5-phenyl-1H-pyrazole-3- carboxamide trifluoroacetate, 0.038 g (0.305 mmol) of isonicotinic acid, and 5 mL of THF was added 0.137 g (0.319 mmol) of COMU followed by 79 µL (0.43 mmol) of DIPEA. The reaction mixture was allowed to stir at rt overnight, quenched by the addition of saturated aqueous NH4Cl, and extracted with DCM. The solvents were removed under reduced pressure and the residue was subjected to HPLC to give 59 mg (45%) of N-(2-(5-Phenyl-1H-pyrazole-3carboxamido)ethyl)isonicotinamide trifluoroacetate as a white solid: >98% pure by LCMS at 214nM, <sup>1</sup>H-NMR (400 MHz, d<sup>6</sup>-DMSO):  $\delta$  8.97 (brs, 1H), 8.79 (d, J = 6.0 Hz, 2H), 8.46 (brs, 1H), 7.86 (dd, J = 4.8 and 1.4 Hz), 7.77 (d, J = 8.4 Hz, 2H), 7.44 (t, J = 7.4 Hz, 2H), 7.34 (t, J = 7.4 Hz, 1H), 7.10 (s, 1H), 3.47-3.43 (m, 4H); <sup>13</sup>C NMR (125MHz, d<sup>6</sup>-DMSO): δ 164.5, 161.1, 158.7, 158.4, 158.1, 148.8, 143.1, 129.0, 128.2, 125.2, 122.0, 102.4, 38.2; (ESI)  $m/z = 336.20 [M + H]^+$ .

#### Cell culture

For DNA content measures in culture, cells were plated at 2500 cells/well in a 96-well plate and allowed to attach for 24hrs at 37°C. Treatments were added at t=0 in RPMI + 10% FBS + P/S. Cells were fixed in 100% MeOH for 20 minutes at 4°C, washed with PBS, and stored in PBS at 4°C. For the Syto60 assay, the cells were incubated with 1/20K Syto60 (Invitrogen) in PBS for 30 minutes at RT. The cells were then washed with PBS and emissions at 680nm were read on an Odyssey plate reader (LI-CORE Biosciences). For cell invasion studies, cells were treated for 24 hours with a 10  $\mu$ M concentration of either ML327 or 266Y, then plated in a matrigel-covered invasion chamber. Cells were allowed 48 hours to invade, then stained with Calcein AM (Life

Technologies, Inc.) and counted using a fluorometer. The proportion of invading cells was calculated, normalized to the DMSO treated controls. Protein stability assays in SW620inv cells were performed by pretreating the cells with 10 $\mu$ M ML327 or DMSO for 2 hours, and subsequently treating with 200  $\mu$ g/ml cycloheximide (CHX). Cells were harvested at various time points after treatment with CHX. Western blot analysis was performed with anti-HNF4 $\alpha$  antibody (Santa Cruz). Dimethylsufoxide (DMSO), cycloheximide (CHX), and Trichostatin A (TSA) were obtained commercially (Sigma Chemical, St. Louis, Mo.).

### Primers

E-cadherin (F: TTG ACG CCG AGA GCT ACA C, R: GTC GAC CGG TGC AAT CTT, UPL probe 80), PMM1 (F: TTC TCC GAA CTG GAC AAG AAA, R: CTC TGT TTT CAG GGC TTC CA, UPL probe 7), Occludin (F: AGG AAC CGA GAG CCA GGT, R: GGA TGA GCA ATG CCC TTT AG, UPL probe 84), Vimentin (F: GAC CAG CTA ACC AAC GAC AAA, R: GTC GAC CGG TGC AAT CTT, UPL probe 39).

The following primers were used for the ChIP assay: *CDH1* (-76/64) forward: 5'-GTG AAC CCT CAG CCA ATC AGC GGT-3'; reverse: 5'-GGA GCG GGC TGG AGT CTG AAC TG-3'. *CDH1* (-452/-339) forward: 5'- CAG CTA CTA GAG AGG CTG GGG CC- 3'; reverse: 5'- AGA TGG GGC TCA CTC TTT CAC CC-3'. *CDH1* (-179/38) forward: 5'- ACT CCA GGC TAG AGG GTC ACC-3'; reverse 5'- CCG CAA GCT CAC AGG TGC TTT GCA GTT CC-3'. *CDH1* (13/152) forward: 5'- ACT GCA AAG CAC CTG TGA GCT TGC G-3'; reverse 5'- GCC GAG AGG CTG CGG CTC CAA G-3'. Pol II and control GAPDH primers were supplied with the Magna ChIP<sup>TM</sup> A/G kit.

#### SNAIL ON-TARGETplus SMARTpool siRNA Target Sequences

- 1) GCGAGCUGCAGGACUCUAA
- 2) AAUCGGAAGCCUAACUACA
- 3) GUGACUAACUAUGCAAUAA
- 4) GAGUAAUGGCUGUCACUUG

## HNF4A ON-TARGETplus SMARTpool siRNA Target Sequences

- 1) GACCGGAUCAGCACUCGAA
- 2) CGGAAGAACCACAUGUACU
- 3) GGCUGGCAUGAAGAAGGA
- 4) CCAAGUACAUCCCAGCUUU



Supplementary Figure 1: Characterization of highly invasive "SW620inv" cells. SW620 (passage 92) from ATCC and 3 independently prepared populations of SW620inv cells (1, 2, 3) were treated with either DMSO or  $0.33\mu$ M TSA in serum free culture media and cultured for 24 hours. (A) Western blot showing E-cadherin and  $\beta$ actin from 24 hour protein lysates. (B) Immunofluorescence of E-cadherin (red) relative

to cell nuclei (blue) comparing SW620 and SW620inv population B. Images are taken at 200x magnification. **(C)** Matrigel transwell invasion assay of SW620 cells compared with 4 independent populations of SW620inv. The number of invading cells is graphed for each group. \*\*\*\* = p<0.00005, \*\* = p<0.005 (Student's t-test).



**Supplementary Figure 2: Inhibition of tumor cell migration** *in vivo.* **(A)** Microscopic images (50x magnification) of colonies formed in a representative embryo at day 16 and day 18 following injection.



Supplementary Figure 3: Treatment with ML327 increases E-cadherin mRNA and protein expression in both transformed and non-transformed cells. (A) Quantitative PCR results for E-cadherin specific mRNA in SW620inv and H520 cells following treatment for 6 hours with 10  $\mu$ M ML327, fold change calculated as above. (B) Western blot shows time dependent changes in H520 E-cadherin protein expression relative to  $\beta$ -actin following treatment with DMSO, 10  $\mu$ M ML327, or 266Y. (C) Western blot shows induction of E-cadherin protein expression in lung cancer (H460, H661) and in non-transformed (293T, HMEC-1) cells following treatment with 10  $\mu$ M ML327 for 24 hours.

-491 AAAAAATTAGCCTGGCGTGGTGGTGGTGGT ACCTGTACTCCCAGCTACTAGAGAGGCTGGGGCCAGAGGAC CGCTTGAGCCCAGGAGTTCGAGGCTGCAGTGAGCTGTGATCGCACCACTGCACTCCAGCTTGGGTGAAA HNE4A AMI 1 GAGTGAGCCCCATCTCCAAAACGAACAAACAAAAAAACCCCAAAAAAACAAAAGAACTCAGCCAAGTGTAA AAGCCCTTTCTGATCCCAGGTCTTAGTGAGCCACCGGCGGGGCTGGGATTCGAACCCAGTGGAATCAGA ACCGTGCAGGTCCCATAACCCACCTAGACCCTAGCAACTCCAGGCTAGAGGGTCACCGCGTCTATGCGAG GCCGGGTGGGGGGGGCGTCAGCTCCGCCCTGGGGAGGGGTCCGCGCTGCTGATTGGCTGTGGCCGG E-Box forward primer(ChIP) CGGTACGGGGGGGGGGGGGGGCTCACCGGGGGGCGCACG TCAGCCAATCA START CACCCCCTCTCAGTGGCGTCGGAACTGCAAAGCACCTGTGAGCTTGCGGAAGTCAGTTCAGACTCCAGC HNF4A reverse primer(ChIP) GGCCCTTGGAGCCGCAGCCTCTCGGCGCTGCTGCTGCTGCCAGGTCTCCTCTTGGCTCTGCCAG +192

Supplementary Figure 4: Features of the human E-cadherin promoter region implicated in ML327 studies. Schematic showing the sequence of the -491 to +138bp promoter region of the human E-cadherin promoter (adapted from Liu, et al.[14]). Downward pointing arrows with base pair (bp) position numbers indicating the boundaries of plasmids E6, E7 and E8 are indicated. The transcriptional start site (codon AGT) is marked with a bold arrow, E-boxes (CACCTG or CAGGTG) are designated by boxes and SNAI binding sites are underlined and indicated below the sequence. HNF4 $\alpha$  binding sites are underlined and indicated with light green sequence. The sequence of the PCR product used in the ChIP assays (139bp product from -76bp to +64bp) is indicated by a bold blue underline. The sequences for additional transcription factors of interest including P300, AML1, HNF3 and SP1 are underlined and indicated by italics. The sequence with dark black typing represents E-cadherin regulatory sequences E8 (-38/+135).



Supplementary Figure 5: Validation of global increased expression of developmental genes implicated by expression profiling. Four upregulated genes (Snail1, Snail2, NFATc2, and MTSS1) from SW620inv\_CHX and H520\_CHX RNAseq datasets were selected to check the mRNA levels by real time q-PCR in each RNAseq samples, fold change calculated as above.



Supplementary Figure 6: SNAIL protein expression is affected by ML327, and depletion of SNAIL does not increase E-cadherin expression in SW620inv cells. (A) Western blot showing the Snail and Slug proteins level in SW620inv cells following 3 hours treatment with DMSO or 10  $\mu$ M ML327. (B) Western blot showing the effect of Snail siRNA mediated knock-down (siScr = control, 48hr. recovery following transfection) on E-cadherin protein expression following treatment with DMSO or 10 $\mu$ M ML327 for 24 hours. Snail and E-cadherin protein levels are shown.



Supplementary Figure 7: TP53 and NUPR1 are additional potential upstream regulators of network perturbations elicited by ML327.



Supplementary Figure 8: HNF4 $\alpha$  diminishes the effect of ML327 on restoring Ecadherin protein. LEFT, three independent Western blots showing the effect of HNF4 $\alpha$ siRNA mediated knock-down (siScr = control, 48hr. recovery following transfection) on E-cadherin (Ecad) protein expression following treatment with DMSO or 10µM ML327 for 24 hours. E-cadherin and HNF4 $\alpha$  protein levels are shown. RIGHT, the graph shows the quantification fold change of E-cadherin protein levels from 3 independent experiments matching left panel with the Odyssey IR imaging system. Statistical significance was calculated using unpaired t test, \*\* indicates p<0.01.



Supplementary Figure 9: ML327 does not significantly alter HNF4 $\alpha$  binding to *GAPDH* promoter. Results of ChIP assay demonstrating HNF4 $\alpha$  association with the *GAPDH* promoter following 4 hours treatment of SW620inv cells with either DMSO, or 10 $\mu$ M ML327 (results from a representative experiment with n=3 technical replicates shown). Statistical significance was calculated using unpaired t test, \* indicates p<0.05. The grafted data is representative of at least three separate experiments with similar results.



Supplementary Figure 10: HNF4 $\alpha$  is associated with ML327 activity towards Ecadherin, but not other ML327 effected targets. Quantitative PCR results for Ecadherin, Snail1, and NFATC2 specific mRNA in SW620inv cells following HNF4 $\alpha$ knock down with siRNA for 48 hours, then treatment with DMSO, 10µM ML327 or 266Y for 6 hours, Fold change relative to si-control with DMSO treatment is determined by the formula log2<sup>- $\Delta\Delta$ Cp</sup>.

DMR72         LDLR           EOMES         D2           L3MBTL3         MED26           SK13A2         CCNL1           SK1         BRD2           PCDF20         CLK1           RREB1         HSPA8           BGL11B         TOB2           ZNF365         ZBT52           CCDC71L         PCF11           ISL1         AXIN2           GATA3         RBM39           SHC4         ZNF365           SLC40A1         CCN72           OTX1         KDMBB           CLU         SDE2           OTX1         KDMBB           CLU         SDE2           FOXC1         KANSL2           RAB39B         RSRC2           CCDD2         PABPC4           FLRT3         SERTAD3           SHAC4         ZNPP           PODH1         EIF5           CYP2U1         SIRT1           GATA6         BPD1           CZCD4         KPN2           SYNM         YTHOF1           LOX         SET5           SYNM         TOP1           LOX         SET05           SYNM <td< th=""><th>Up-regulated genes</th><th>Down-regulated genes</th></td<>	Up-regulated genes	Down-regulated genes
EOMES         ID2           ISMBTL3         MED26           SLC30A2         CCNL1           SIX1         BRD2           PCDH20         CLK1           RREB1         HSPA8           BCL11B         TOB2           ZNF365         ZBT82           CCDC71L         PCF11           SL1         AKIN2           GATA3         RBM39           SHC4         ZNF365           SL2         COC071L           GATA3         RBM39           SHC4         ZNF408           SL200A1         CCNT2           OTX1         KDM6B           SL20A2         SDE2           FOXC1         KANS12           RAB39B         RSC2           CCND2         PABPC4           FLRT3         SERTAD3           HSPA2         TXNIP           PDDH1         EIF5           CYP2U1         SIRT1           GATA6         PPRC1           SIPA1         SET05           SYNM         THDF1           LOX         SET05           SYNM         TDP1           LOX         SET05           SYNM	DMRT2	LDLR
Imit Times         MED26           SUC30A2         CCNL1           SUC30A2         CCNL1           SUC30A2         CCNL1           SUC30A2         CCNL1           PCDFRD         HSPA8           BCL11B         HSPA8           BCL11B         TOB2           ZNF386         ZBTB2           CCDC71L         PCF11           SL1         AXIN2           GATA3         RBM39           SHC4         ZMF408           SUC40A1         CCNT2           OTX1         KOM6B           CLU         SNIP1           SUC302         SDE2           FOXC1         KANSL2           FAB39B         RSRC2           CCND2         PABPC4           FLRT3         SERTAD3           HSPA2         TXNIP           PCDH1         EIF5           CYP2U1         SIRT1           GATA6         PRPC1           RGS16         BRD1           CYP2U1         SIF30           SYMM         YTHOP1           LOX         SET05           SYP1         ZMF384           SYP1         ZMF384	EOMES	ID2
SLC30A2         CCNL1           SX1         BFD2           SX1         BFD2           RREB1         HSPA8           BCL11B         T0B2           ZNF385         ZBT52           CCDC71L         PCF11           SL1         AXIN2           GATA3         RBM39           SHC4         ZNF408           SLC40A1         CCNT2           OTX1         KDM6B           CLU         SNP1           SHO2         SPE2           FOXC1         KANSL2           RA399B         RSRC2           CCND2         PABPC4           FLT3         SETAD3           HSFA2         TNNP           PCDH1         EIF5           CYP2U1         SIRT1           GATA6         PRC1           RA536         BRD1           CZCDAA         KPNA2           SYMM         YTHOF1           LOX         SET5           SYF1         ZNF367           SYP1         ZNF367           SYP1         ZNF367           SYP1         ZNF367           SYP1         ZNF367           SYP1	I 3MBTI 3	MED26
Sixt         BRD2           PCDF20         CkF1           PCDF20         HSPA8           BCL11B         TOB2           BCL11B         TOB2           CCDC7tL         PCF11           SL1         AXIN2           GATA3         RBM39           SHC4         ZMF306           SHC4         ZMF408           SUC40A1         CCNT2           OTX1         KDM6B           CLU         SNIP1           SHO2         SDE2           FOXC1         KANSL2           FOXC1         SIRT1           GATA6         PPC1           CXD2         FOXC1           CYP2U1         SIRT1           GATA6         PRC1           RGS16         BRD1           CYP2U1         SIF3           SYMM         YTHOP1           LOX         SPF367           SYP1         ZMF394           SYP1	SI C30A2	CCNL1
PCOPR0         CLK1           RREB1         HSPA8           RREB1         HSPA8           SUL1B         T0B2           ZNF365         ZBTB2           CCDC71L         PCF11           ISL1         AXIN2           GATA3         RBM39           SHC4         ZNF408           SLC40A1         CCNT2           OTX1         KDM6B           CLU         SNIP1           SHOX2         SDE2           FOXC1         KANSL2           RA839B         RSRC2           CCND2         PABPC4           FLRT3         SERTAD3           HSPA2         TKNP           PCDH1         EIF5           CYP2U1         SIRT1           GATA6         PPRC1           RG516         BRD1           CZCD4A         KFNA2           SYMM         YTHDF1           LI0KA         ZNF394           SYFP1         ZNF394           SYFP1         ZNF394           SYFP1         ZNF394           SYFP1         ZNF394           SYFP1         ZNF394           SYFP1         ZNF394 <t< td=""><td>SIX1</td><td>BRD2</td></t<>	SIX1	BRD2
NREB1         HSPA8           BCL11B         TOB2           BCL11B         TOB2           CCDC71L         PCF11           SL1         AXIN2           GATA3         RBM39           SHC4         ZNF408           SUC40A1         CCNT2           OTX1         CMM6B           CLU         SNIP1           SHC4         SNIP1           SHC5         C22           FDXC1         KANSL2           RAB39B         RSC2           CCND2         PABC4           FLRT3         SERTAD3           HSFA2         TXNIP           PCDH1         EIF5           CYP2U1         SIRT1           GATA6         PPRC1           RG516         BRD1           C2CD4A         KPNA2           SYMM         YHDF1           LOX         SETD5           SYP1         ZNF394           SVP1	PCDH20	CLK1
NACLI         IND AD           BCL11B         TOB2           ZNF385         ZBTB2           CCDC71L         PCF11           ISL1         AXIN2           GATA3         RBM39           SHC4         ZNF408           SLC40A1         CONT2           OTX1         KDM6B           CLU         SIPF1           SHOX2         SDE2           FOXC1         KANSL2           FOXC1         KANSL2           FABS0B         RSRC2           CCND2         PABPC4           FURT3         SERTAD3           HSPA2         TXNIP           PCDH1         EIF5           CYP2U1         SIRT1           GATA6         PPRC1           RGS16         BRD1           CZOZD4A         KPIN2           SYNM         VTHOP1           LOX         SETD5           SYNM         TOP1           LOX         SETD5           SVEP1         ZNF367           SVEP1         ZNF367           SVEP1         ZNF367           SVEP1         CDC1050502170           SVEP1         CDP16	PREB1	HSDAR
DDC 11D         DDC           ZNF365         ZBTB2           CCDC71L         POF11           SL1         AXIN2           GATA3         RBM39           SHC4         ZNF408           SLC40A1         CCNT2           OTX1         KDM6B           CLU         SNIP1           SHC4         SNIP1           SHC7         KANSL2           F0XC1         KANSL2           RAB39B         RSRC2           CCND2         PABPC4           F1XT3         SERTAD3           HSPA2         TXNIP           PCDH1         EIF5           CY2U1         SIRT1           GATA6         PPRC1           RGS16         BRD1           C2CD4A         KPNA2           SYNM         YHDF1           LOX         SETD5           SIPA1L2         AKAP8           L10RA         ZNF394           SYNM         UHDF1           LOX         SETD5           SYBU         DNAJA1           ZHF394         SYBU           SYBU         DNAJA1           ZHF47         TOP1           CEBPA <td></td> <td>TOP2</td>		TOP2
Zhi 330         Zhi Zz           SL1         AXIN2           ISL1         AXIN2           ISL1         AXIN2           GATA3         RBM39           SHC4         Zh/F408           SLC40A1         CCNT2           OTX1         KDM6B           SHOX2         SDE2           FOXC1         KANISL2           FA339B         RSRC2           CCND2         PABPC4           FLRT3         SERTAD3           HSPA2         TXNIP           PCDH1         EIF5           CYP2U1         SIRT1           GATA6         PRC1           RGS16         BR01           CZCD4A         KPNA2           SYNM         YTHDF1           LOX         SETD5           SYNM         YTHDF1           LOX         SETD5           SYNM         YTHDF1           LOX         SETD5           SYNM         YTHDF1           LOX         SETD5           SYRA         DNAA11           TAR4         PPP17334           SYRA         DNAA11           IL10RA         ANKP13C           CEPA </td <td>ZNE265</td> <td></td>	ZNE265	
CUDUTIL         FUPTI           ISL1         AXIN2           GATA3         RBM39           SHC4         ZNF408           SLC40A1         CCNT2           OTX1         KDM6B           CLU         SNIP1           SHC4         SDE2           FOXC1         KAINSL2           RAB39B         RSRC2           CCND2         PABPC4           FLRT3         SERTAD3           SHS74         TXNIP           PCOPH1         EIF5           CYP2U1         SIRT1           GATA6         PPRC1           RGS16         BRD1           C2CD4A         KPNA2           SYNM         YTHDF1           LIORA         ZNF367           SVEP1         ZNF367           SVEP1         ZNF394           SVEP1         SPATA2		
ISE1         AKINZ           GATA3         RBM39           SHC4         ZMF408           SUC40A1         CCNT2           OTX1         KDM6B           CLU         SNIP1           SHOX2         SDE2           FOXC1         KANSL2           FOXC2         SDE2           COND2         PABPC4           COND2         PABPC4           CVP2U1         SERTAD3           HSPA2         TXNIP           PCOH1         EIF5           CVP2U1         SIRT1           GATA6         PPRC1           GATA6         PPRC1           SYNM         YTHDF1           LOX         SETD5           SYNM         YTHDF1           LOX         SETD5           SYBU         DNAJA1           ZFHX2         NXF1           GF1         TOP1           GEBA         PPP1R15B           HCP5         WHAMM           NPPC         EIF1AD           RF6         LOC100507217           SEMA6B         ANKRD13C           CC1012         SPATA2           FKC1012         SPATA2 <td< td=""><td></td><td>PUFTI</td></td<>		PUFTI
GA1A3         PR0M39           SHC4         ZNF408           SLC40A1         CCN72           OTA1         KDM6B           CLU         SNIP1           SHOX2         SDE2           FOXC1         KANSL2           RAB39B         RSRC2           CCND2         PABPC4           FLRT3         SERTAD3           SP22         TXNIP           PCDD1         ElF5           CYP2U1         SIRT1           GATA6         PPRC1           RGS16         BRD1           C2CD4A         KFNA2           SYWM         YTHDF1           LOX         SETD5           SIVEF1         ZNF394           SYBU         DNAJA1           SYBU<	ISL1	AXIN2
SHC4     ZII-408       SILC40A1     CCNT2       OTX1     KDM6B       OTX1     KDM6B       OTX1     SNIP1       SHOX2     SDE2       FOXC1     KAINSL2       FOXC1     KAINSL2       CCND2     PABPC4       CCND2     PABPC4       CCND2     PABPC4       CCND2     PABPC4       CYP2U1     SIRT10       FFA3     SERTAD3       HSPA2     TXNIP       PCDH1     EIF5       CYP2U1     SIRT1       GATA6     PPRC1       RGS16     BRD1       C2CD4A     KPNA2       SYNM     YHDF1       LOX     SETD5       SIPA1L2     AKAP8       L10RA     ZNF3867       SVEP1     SDE1       GERA     PPP1R15B       HCP5     WHAMM       NPPC     EIF140 <td>GATA3</td> <td>RBM39</td>	GATA3	RBM39
SL240A1         CCN12           OTX1         KM6B           ClU         SNIP1           SH0X2         SDE2           FOXC1         KANSL2           RAB39B         RSRC2           CCND2         PABPC4           FLRT3         SERTAD3           HSPA2         TXNIP           PCDH1         EIF5           CY2U1         SIRT1           GATA6         PPRC1           RG516         BRD1           C2CD4A         KPNA2           SYNM         YTHDF1           LOX         SETD5           SYNM         YTHDF1           LOX         SETD5           SYPA112         AKAP8           LIORA         ZNF367           SVEP1         ZNF367           SYBU         DNAJA1           ZHX2         NXF1           GF11         TOP1           CEBPA         PPP1R15B           HCP5         WHAMM           NPPC         EIF1AD           IRF6         LOC10507217           SEMA6B         ANKP132C           CDH1         KM72           FZ5         FASTKD5           HE	SHC4	ZNF408
OTX1         KDM6B           CLU         SNIP1           SHOx2         SDE2           FOXC1         KANSL2           RAB39B         RSRC2           CCND2         PABPC4           FLRT3         SERTAD3           HSPA2         TXNIP           PCDH1         EIF5           CYP2U1         SIRT1           GATA6         PPRC1           GYAM         KPNA2           SYNM         VTHDF1           LOX         SETD5           SYPA1L2         AKAP8           L10RA         ZVF394           SYEP1         ZVF394           LOX         SETD5           SVPA1L2         AKAP8           L10RA         ZVF394           SYEP1         ZVF394           SYBU         DNAJA1           ZFHX2         NXF1           GF11         TOP1           CEBPA         PPP1R15B           HCP5         WHAMM           NPPC         EIF1AD           IRF6         LOC10507217           SEMABB         AVKP13C           CDH1         KMEX1           KCTD12         SPATA2	SLC40A1	CCN12
CLU     SNIP1       SHOX2     SDE2       FOXC1     KANSL2       RAB39B     RSRC2       CCND2     PABPC4       FLRT3     SERTAD3       HSPA2     TXNIP       PCDH1     EIF5       CY2U1     SIRT1       GATA6     PPRC1       RGS16     BRD1       C2CD4A     KPNA2       SYNM     YTHDF1       LOX     SETD5       SIPA1L2     AKAP8       IL10RA     ZNF367       SYBU     DNAJA1       ZFHX2     NXF1       GF11     TOP1       CEBPA     PPP1R15B       HCP5     WHAMM       NPPC     EIF1AD       IRF6     LOC100507217       SEMA6B     AKNPD13C       CDH1     KMT2E       KCTD12     SPATA2       BHLHE41     TBCC       HEY2     FASTKD5       TMEM151A     ZKS2       ABCB1     ZFX       FZD10     RBM5       TMCKLE1     SMEK1       PAX9     RNF10	OTX1	KDM6B
SH0X2         SDE2           F0XC1         KANSL2           RAB39B         RSRC2           CCND2         PABPC4           FLRT3         SERTAD3           HSPA2         TXNIP           PCDH1         EIF5           CYP2U1         SIRT1           GATA6         PPRC1           C2CD4A         KPNA2           SYNM         YTHDF1           LOX         SETD5           SIPA1L2         AKAP8           LIORA         ZNF367           SVEP1         ZNF364           SYBU         DNAJA1           ZFHX2         MKF1           GFI1         TOP1           CEBPA         PPP1R15B           HCP5         WHAMM           NPPC         EIF1AD           RF66         LOC100507217           SEMA6B         ANKRD13C           CDH1         KMT2E           KCTD12         SPATA2           BHLHE41         TBCC           HEY2         FASTKD5           TMEM151A         CKS2           ABCB1         ZFX           FZD10         RBM5           TMEKN151A         ZCCHC3 <t< td=""><td>CLU</td><td>SNIP1</td></t<>	CLU	SNIP1
FOXC1       KANSL2         RAB39B       RSRC2         CCND2       PABPC4         FLRT3       SERTAD3         HSPA2       TXNIP         PCDH1       EIF5         CYP2U1       SIRT1         GATA6       PPRC1         R6S16       BRD1         C2CD4A       KPNA2         SYNM       YTHDF1         L0X       SETD5         SIPA1L2       AKAP8         L10RA       ZNF394         SYBU       DNAJA1         ZFHX2       NXF1         GF1       TOP1         GEBPA       PPP1R15B         HCP5       WHAMM         NPPC       EIF1AD         NPC       EIF1AD         NPPC       EIF1AD         NPPC       EIF1AD         NPPC       EIF1AD         NPPC       EIF1AD         NPPC       FASTA2         BHLHE41       TBCC         HEY2       FASTKD5         TMEM151A       ZKS2         ABCB1       ZFX         ABCB1       ZFX         ABCB1       ZFX         ABCB1       ZFX         ABC	SHOX2	SDE2
RAB39B         RSRC2           CCND2         PABPC4           FLRT3         SERTAD3           HSPA2         TXNIP           PCDH1         EIF5           CYP2U1         SIRT1           GATA6         PPRC1           RGS16         BRD1           C2CD4A         KPNA2           SYNM         YTHDF1           LOX         SETD5           SYPA1L2         AKAP8           LI10RA         ZNF394           SYBU         DNAJA1           SYBU         SYBU           SYBU	FOXC1	KANSL2
COND2         PABPC4           FLRT3         SERTAD3           HSPA2         TXNIP           PCDH1         EIF5           CYP2U1         SIRT1           GATA6         PPRC1           RGS16         BRD1           C2CD4A         KPNA2           SYNM         YTHDF1           LOX         SETD5           SIPA1L2         AKAP8           IL10RA         ZNF367           SVEP1         ZNF367           SVEP1         ZNF394           SYBU         DNAJA1           ZFHX2         NXF1           GF11         TOP1           GEBPA         PP1R15B           HCP5         WHAMM           NPPC         EIF1AD           IRF6         LOC100507217           SEMA6B         ANKRD13C           CDH1         KMT2E           KCTD12         SPATA2           BHLHE41         TBCC           HEY2         FASTKD5           TMEM151A         CKS2           ABCB1         ZFX           FZD10         RBM5           TMCC2         ZCCHC3           PAX9         RNF10	RAB39B	RSRC2
FLRT3       SERTAD3         HSPA2       TXNIP         PCDH1       ElF5         CYP2U1       SIRT1         GATA6       PPRC1         RGS16       BRD1         C2CD4A       KPNA2         SYNM       YTHDF1         LOX       SETD5         SIPA1L2       AKAP8         ILORA       ZNF397         SVEP1       ZNF397         SVEP1       ZNF394         SYBU       DNAJA1         ZFHX2       NXF1         GFI1       TOP1         CEBPA       PPP1R15B         HCP5       WHAMM         NPPC       ElF1AD         IRF6       LOC100507217         SEMA6B       ANKRD2         CDH1       KMT2E         KCTD12       SPATA2         BHLHE41       TBCC         HEY2       FASTKD5         TMEM151A       CKS2         ABCB1       ZFX         FZD10       RBM5         TMCC2       ZCHC3         PAX9       SME41	CCND2	PABPC4
HSPA2         TXIIP           PCDH1         EIF5           GATA6         PPRC1           GATA6         PPRC1           RGS16         BRD1           C2CD4A         KPINA2           SYMM         YTHDF1           LOX         SETD5           SIPA1L2         AKAP8           IL10RA         ZNF367           SVEP1         ZNF367           SYBU         DINAJA1           ZFHX2         NXF1           GFI1         TOP1           CEBPA         PPP1R15B           HCP5         WHAMM           NPPC         EIF1AD           IRF6         LOC100507217           SEMA6B         ANKRD13C           CDH1         KMT2E           KCTD12         SPATA2           BHLHE41         TBCC           HEY2         FASTKD5           TMEM151A         CKS2           ABCB1         ZFX           FZD10         RBM5           TMCC2         ZCHC3           PRICKLE1         SMEK1           PAX9         RNF10	FLRT3	SERTAD3
PCDH1         EIF5           CYP2U1         SIRT1           GATA6         PPRC1           RGS16         BRD1           C2CD4A         KPNA2           SYMM         YTHDF1           LOX         SETD5           SIPA1L2         AKAP8           L10RA         ZNF367           SVEP1         ZNF394           SYBU         DNAJA1           ZFHX2         NXF1           GFI1         TOP1           CEBPA         PPP115B           HCP5         WHAMM           NPPC         EIF1AD           IRF6         LOC10507217           SEMA6B         ANKRD13C           CDH1         KMT2E           KCTD12         SPATA2           BHLHE41         TBCC           HEY2         FASTKD5           TMEM151A         ZFX           ABCB1         ZFX           ABCB1         ZFX           FZD10         RBM5           TMCC2         ZCHC3           PRICKLE1         SMEK1           PAX9         RNF10	HSPA2	TXNIP
CYP2U1         SIRT1           GATA6         PPRC1           RGS16         BRD1           C2CD4A         KPNA2           SYMM         YTHDF1           LOX         SETD5           SIPA1L2         AKAP8           IL10RA         ZNF367           SVEP1         ZNF367           SVBU         ZNAJA1           ZFHX2         NXF1           GF1         TOP1           CEBPA         PPP1R15B           HCP5         WHAMM           NPPC         EIF1AD           IRF6         LOC100507217           SEMA6B         ANKRD13C           CDH1         KMT2E           KCTD12         SPA1742           BHLHE41         TBCC           HEY2         FASTKD5	PCDH1	EIF5
GATA6         PPRC1           RGS16         BRD1           C2CD4A         KPNA2           SYVM         YTHDF1           LOX         SETD5           SIPA1L2         AKAP8           IL10RA         ZNF367           SVEP1         ZNF394           SYBU         DNJA1           ZFHX2         NXF1           GF11         TOP1           CEBPA         PPPR15B           HCP5         WHAMM           NPPC         EIF1AD           IRF6         LOC100507217           SEMA6B         ANKRD13C           CDH1         KMT2E           KCTD12         SPATA2           BHLHE41         TBCC           HEY2         FASTKD5           TMEM151A         CKS2           ABCB1         ZCHC3           PRIXLE1         SMK1           PAX9         RNF10	CYP2U1	SIRT1
RGS16         BRD1           C2CD4A         KPNA2           SYNM         YTHDF1           LOX         SETD5           SIPA1L2         AKAP8           IL10RA         ZNF307           SVEP1         ZNF304           SYBU         DNAJA1           ZFHX2         NXF1           GF11         TOP1           CEBPA         PPPIR15B           HCP5         WHAMM           NPPC         EIF1AD           IRF6         LOC100507217           SEMA6B         ANKRD13C           CDH1         KMT2E           KCTD12         SPATA2           BHLHE41         TBCC           HEY2         FASTKD5           TMEM151A         CKS2           ABCB1         ZFX           FZD10         RBM5           TMCC2         ZCCHC3           PRICKLE1         SMEK1           PAX9         RNF10	GATA6	PPRC1
C2CD4A         KPNA2           SYNM         YTHDF1           LOX         SETD5           SIPA1L2         AKAP8           IL10RA         ZNF367           SVEP1         ZNF394           SYBU         DNAJA1           ZFHX2         NXF1           GFI1         TOP1           CEBPA         PPP1R15B           HCP5         WHAMM           NPPC         EIF1AD           IRF6         LOC100507217           SEMA6B         ANKRD13C           CDH1         KMT2E           KCTD12         SPATA2           BHLHE41         TBCC           HEY2         FASTKD5           TMEM151A         ZFX           FZD10         RBM5           TMCC2         ZCHC3           PRICKLE1         SMEK1           PAX9         RNF10	RGS16	BRD1
SYMM         YTHDF1           LOX         SETD5           SIPA1L2         AKAP8           IL10RA         ZNF367           SVEP1         ZNF394           SYBU         DNAJA1           ZFHX2         NXF1           GFI1         TOP1           CEBPA         PPP1R15B           HCP5         WHAMM           NPPC         EIF1AD           IRF6         LOC100507217           SEMA6B         ANKRD13C           CDH1         KMT2E           KCTD12         SPATA2           BHLHE41         TBCC           HEY2         FASTKD5           TMEM151A         CKS2           ABCB1         ZFX           FZD10         RBM5           TMCC2         ZCCHC3           PRICKLE1         SMEK1           PAX9         RNF10	C2CD4A	KPNA2
LOX       SETD5         SIPA1L2       AKAP8         IL10RA       ZNF367         SVEP1       ZNF394         SYBU       DNAJA1         ZFHX2       NXF1         GFI1       TOP1         CEBPA       PPP1R15B         HCP5       WHAMM         NPPC       EIF1AD         IRF6       LOC100507217         SEMA6B       ANKRD13C         CDH1       KMT2E         KCTD12       SPATA2         BHLHE41       TBCC         HEY2       FASTKD5         TMEM151A       CKS2         ABCB1       ZFX         FZD10       RBM5         TMCC2       ZCCHC3         PRICKLE1       SMEK1         PAS9       RNF10	SYNM	YTHDE1
SIPA 11.2       AKAP8         IL 10RA       ZNF367         SVEP1       ZNF394         SYBU       DNAJA1         ZFHX2       NXF1         GFI1       TOP1         CEBPA       PPP1R15B         HCP5       WHAMM         NPPC       EIF1AD         IRF6       LOC100507217         SEMA6B       ANKRD13C         CDH1       KMT2E         KCTD12       SPATA2         BHLHE41       TBCC         HEY2       FASTKD5         TMEM151A       CKS2         ABCB1       ZFX         FZD10       RBM5         TMCC2       ZCCHC3         PRICKLE1       SMEK1         PAS9       RNF10		SETD5
IL10RA       ZNF367         SVEP1       ZNF394         SYBU       DNAJA1         ZFHX2       NXF1         GFI1       TOP1         CEBPA       PPP1R15B         HCP5       WHAMM         NPPC       EIF1AD         IRF6       LOC100507217         SEMA6B       ANKRD13C         CDH1       KMT2E         KCTD12       SPATA2         BHLHE41       TBCC         HEY2       FASTKD5         TMEM151A       CKS2         ABCB1       ZFX         FZD10       RBM5         TMCC2       ZCHC3         PRICKLE1       SMEK1         PAS       RNF10	SIPA112	ΔΚΔΡ8
Initial       ZNF394         SVEP1       DNAJA1         ZFHX2       NXF1         GFI1       TOP1         CEBPA       PPP1R15B         HCP5       WHAMM         NPPC       EIF1AD         IRF6       LOC100507217         SEMA6B       ANKRD13C         CDH1       KMT2E         KCTD12       SPATA2         BHLHE41       TBCC         HEY2       FASTKD5         TMEM151A       CKS2         ABCB1       ZFX         FZD10       RBM5         TMCC2       ZCCHC3         PRICKLE1       SMEK1         PAX9       RNF10	II 10PA	ZNE367
SYEL1       ZHV334         SYBU       DNAJA1         ZFHX2       NXF1         GFI1       TOP1         CEBPA       PPP1R15B         HCP5       WHAMM         NPPC       EIF1AD         IRF6       LOC100507217         SEMA6B       ANKRD13C         CDH1       KMT2E         KCTD12       SPATA2         BHLHE41       TBCC         HEY2       FASTKD5         TMEM151A       CKS2         ABCB1       ZFX         FZD10       RBM5         TMCC2       ZCCHC3         PRICKLE1       SMEK1         PAS9       RINF10	SVED1	ZNF30/
ZFHX2       DNNANT         GFI1       TOP1         CEBPA       PPP1R15B         HCP5       WHAMM         NPPC       EIF1AD         IRF6       LOC100507217         SEMA6B       ANKRD13C         CDH1       KMT2E         KCTD12       SPATA2         BHLHE41       TBCC         HEY2       FASTKD5         TMEM151A       CKS2         ABCB1       ZFX         FZD10       RBM5         TMCC2       ZCCHC3         PRICKLE1       SMEK1         PAX9       RNF10	SVEL 1 SVEL	
ZFTNZ       NAF1         GFI1       TOP1         CEBPA       PPP1R15B         HCP5       WHAMM         NPPC       EIF1AD         IRF6       LOC100507217         SEMA6B       ANKRD13C         CDH1       KMT2E         KCTD12       SPATA2         BHLHE41       TBCC         HEY2       FASTKD5         TMEM151A       CKS2         ABCB1       ZFX         FZD10       RBM5         TMCC2       ZCCHC3         PRICKLE1       SMEK1         PAX9       RNF10		
GFI         TOF1           CEBPA         PPP1R15B           HCP5         WHAMM           NPPC         EIF1AD           IRF6         LOC100507217           SEMA6B         ANKRD13C           CDH1         KMT2E           KCTD12         SPATA2           BHLHE41         TBCC           HEY2         FASTKD5           TMEM151A         CKS2           ABCB1         ZFX           FZD10         RBM5           TMCC2         ZCCHC3           PRICKLE1         SMEK1           PAX9         RNF10		
CEBPA         PPP IN ISB           HCP5         WHAMM           NPPC         EIF1AD           IRF6         LOC100507217           SEMA6B         ANKRD13C           CDH1         KMT2E           KCTD12         SPATA2           BHLHE41         TBCC           HEY2         FASTKD5           TMEM151A         CKS2           ABCB1         ZFX           FZD10         RBM5           TMCC2         ZCCHC3           PRICKLE1         SMEK1           PAX9         RNF10		
HCPS         WHAMM           NPPC         EIF1AD           IRF6         LOC100507217           SEMA6B         ANKRD13C           CDH1         KMT2E           KCTD12         SPATA2           BHLHE41         TBCC           HEY2         FASTKD5           TMEM151A         CKS2           ABCB1         ZFX           FZD10         RBM5           TMCC2         ZCCHC3           PRICKLE1         SMEK1           PAX9         RNF10		PPP IR 15B
NPPC         EIFTAD           IRF6         LOC100507217           SEMA6B         ANKRD13C           CDH1         KMT2E           KCTD12         SPATA2           BHLHE41         TBCC           HEY2         FASTKD5           TMEM151A         CKS2           ABCB1         ZFX           FZD10         RBM5           TMCC2         ZCCHC3           PRICKLE1         SMEK1           PAS9         RNF10		
IKF6         EOC100507217           SEMA6B         ANKRD13C           CDH1         KMT2E           KCTD12         SPATA2           BHLHE41         TBCC           HEY2         FASTKD5           TMEM151A         CKS2           ABCB1         ZFX           FZD10         RBM5           TMCC2         ZCCHC3           PRICKLE1         SMEK1           PAS9         RNF10	NPPC	EIF1AD
SEMAGB         ANKRD13C           CDH1         KMT2E           KCTD12         SPATA2           BHLHE41         TBCC           HEY2         FASTKD5           TMEM151A         CKS2           ABCB1         ZFX           FZD10         RBM5           TMC2         ZCCHC3           PRICKLE1         SMEK1           PAS9         RNF10	IRFO	LUC100507217
CDH1       KMT2E         KCTD12       SPATA2         BHLHE41       TBCC         HEY2       FASTKD5         TMEM151A       CKS2         ABCB1       ZFX         FZD10       RBM55         TMCC2       ZCCHC3         PRICKLE1       SMEK1         PAX9       RNF10	SEMA6B	ANKRD13C
KCTD12       SPATA2         BHLHE41       TBCC         HEY2       FASTKD5         TMEM151A       CKS2         ABCB1       ZFX         FZD10       RBM5         TMCC2       ZCCHC3         PRICKLE1       SMEK1         PAX9       RNF10	CDH1	KMT2E
BHLHE41         TBCC           HEY2         FASTKD5           TMEM151A         CKS2           ABCB1         ZFX           FZD10         RBM5           TMCC2         ZCCHC3           PRICKLE1         SMEK1           PAS9         RNF10	KCTD12	SPATA2
HEY2     FASTKD5       TMEM151A     CKS2       ABCB1     ZFX       FZD10     RBM5       TMCC2     ZCCHC3       PRICKLE1     SMEK1       PAS9     RNF10	BHLHE41	TBCC
TMEM151A     CKS2       ABCB1     ZFX       FZD10     RBM5       TMCC2     ZCCHC3       PRICKLE1     SMEK1       PAX9     RNF10	HEY2	FASTKD5
ABCB1         ZFX           FZD10         RBM5           TMCC2         ZCCHC3           PRICKLE1         SMEK1           PAX9         RNF10	TMEM151A	CKS2
FZD10     RBM5       TMCC2     ZCCHC3       PRICKLE1     SMEK1       PAX9     RNF10	ABCB1	ZFX
TMCC2         ZCCHC3           PRICKLE1         SMEK1           PAX9         RNF10	FZD10	RBM5
PRICKLE1 SMEK1 PAX9 RNF10	TMCC2	ZCCHC3
PAX9 RNF10	PRICKLE1	SMEK1
	PAX9	RNF10
DMRT2 LDLR	DMRT2	LDLR

**Supplementary Table.** The top 50 up-regulated or down-regulated genes from the common differentially expressed genes in SW620inv and H520