SUPPLEMENTAL METHODS

STATISTICS

Statistical significance was calculated using an un-paired, two-tailed student's *t*-test. Tests were considered significant with a p-value of <0.05. All error bars represent standard error of the mean.

PRINCIPAL COMPONENT ANALYSIS (PCA)

PCA is a dimensionality reduction method which collapses multidimensional data to a small number of principal components. The principal components (PC) are ranked in decreasing order of their power to explain the variability in the data, with PC #1 being able to explain the highest amount of variability in the data followed by PC #2 and so on. PCA analysis is useful to represent the overall similarity or differences of gene expression signatures between samples. Specifically, the differences in gene expression can be represented on a plot where PCs #1, 2 and 3 are projected on the x, y and z axes of the plot, respectively. The variability between samples is reflected in their respective spread within each axis on the graph. In Figure 2A, each sphere represents one collapsed sample with *WT* mice in blue, *Mist1*^{KO} in red, and *Mist1*^{KO}*/LSL-Mist1*^{myc} in green. As expected, samples with the same phenotype cluster together. However, the *Mist1*^{KO}*/LSL-Mist1*^{myc} samples cluster near the *WT* samples, demonstrating that *Mist1*^{KO}*/LSL-Mist1*^{myc} mice have altered their gene expression signature from a *Mist1*^{KO} toward a *WT* pattern of expression. PCA plots were created using Partek Genomics Suite.

GENOTYPING PRIMER SETS

Mist1$^{CreER/+}$	5'-ggttaaagcaaattgtcaagtacgg-3', 5'- atagtaagtatgtgcgtcagcg-3', 5'-gaagcattttccaggtatgctcag-3'
LSL-Mist1^{myc}	5’-cgggatccttggtacctatgaag-3’, 5’-cgggatcctcagaagccatagag-3’

PRIMARY ANTIBODIES FOR IMMUNOHISTOCHEMISTRY

anti-Amylase	171534, 1:100, Calbiochem, San Diego, CA
anti-Connexin32	ab66613, 1:200, abcam, Cambridge, MA
anti-myc	clone 9E10, 1:500
anti-Carboxypeptidase A	1810-0006, 1:100, AbD serotec, Kidlington, UK
anti-ZO-1	61-7300, 1:100, Invitrogen, Camarillo, CA
anti-β-actin	4970, 1:200, Cell Signaling, Beverly, MA
anti-E cadherin	ab53033, 1:1,000, abcam, Cambridge, MA
anti-LC3B	3668, 1:800, Cell Signaling, Beverly, MA

REAL-TIME PCR PRIMER SETS

Hprt	5’-aagcagtacagccccaaaat-3’, 5’-tttggcttttccagtttcact-3’
Rab3d	5'-agtgtgacctggaagacgaac-3', 5'-ccagggattcattcatcttgt-3'
Htra2	5’-cattggagtgatgatgctgac-3’, 5’-aatggccaagatcacatcac-3’
Uba5	5’-ggagctggagcaggaactc-3’, 5’-agtcactgacaattcccatcc-3’
Rab27a	5’-gcttaaccactgcattcttca-3’, 5’-cctctggtcttccaggtcact-3’
Abcb6	5’-tctcttctctcacctgcatga-3’, 5’-gatgatgccaatgatgatgtc-3’
Cx32	5’-gtgccagggaggtgtgaat-3’, 5’-gataagctgcagggaccatag-3’
Atp2c2	5’-ttccagactgaaaacctgagc-3’, 5’-ccccttggagtggttagtaca-3’

Wdyhv1	5’-ggacgcatgtgtctacaacag-3’, 5’-cagggaaatggcaaaatagtg-3’
Copz2	5’-cttagataatgacgggcgaag-3’, 5’-aagcacagacatgagcatcag-3’
Foxp2	5’-gacccctggagaggactaaag-3’, 5’-ggctgcttaaagtgctcattc-3’
Slc35d1	5’-tcctggggtattaagatgactg-3’, 5’-tctcctgtgaaatacgcaatg-3’
Nox4	5’-atcaggagcaacaaacctgtc-3’, 5’-accaaatgttgctttggtttc-3’
Gstm4	5’-caggctatggatgtctccaat-3’, 5’-caggatatcgtaagccaggaa-3’
Nfe2l2	5’-cacatccagacagacaccagt-3’, 5’-gggcagtgaagactgaacttt-3’
Rnd2	5’-tgtcctcaagaagtggcaag-3’, 5’-tgacagggatgagtctctgc-3’
Aldh1a1	5’-tggtaaacattgtccctggtt-3’, 5’-cctgcagcttccttgattaac-3’
Ptgr1	5’-cttccctacggacggtaactt-3’, 5’-gtcgccctccttcagtttt-3’
Cldn10	5’-gccgggattgtattcatattg-3’, 5’-tcttgcacaacaaaactcagg-3’
Ppap2b	5’-tactgcaatgacgagagcatc-3’, 5’-tgcttatagagagctgccaca-3’
Smarca1	5’-tgcagaataacttgcatgagc-3’, 5’-tttatccggcgtaacaaaaat-3’
Rbpjl	5’-agatgtgagcagactgtgtgg-3’, 5’-agtcccatgtaaccgcagac-3’
Rab27b	5’-aggagtcgggaagacaacatt-3’, 5’-gctgcagatgtaccttaaacg-3’
Cdh1	5’-gcttcagttccgaggtctaca-3’, 5’-cactttgaatcgggagtcttc-3’
Amylase	5’-cagagacatggtgacaaggtg-3’, 5’-atcgttaaagtcccaagcaga-3’
Elastase	5’-gcaccgagcagtatgtgaac-3’, 5’-gggagagttgttagccaggat-3’
Cpa1	5’-ttaaaaaggcctcagacctca-3’, 5’-cttcaagtgctccaactcctc-3’
Ptf1a	5’-aggttatcatctgccatcgag-3’, 5’-gacacaaactcaaagggtggt-3’
K19	5’-cctcccgagattacaaccact-3’, 5’-aggcgtgttctgtctcaaact-3’
Cftr	5’-gatgtcgagtccaacctgaat-3’, tggtgtctgtacccttcctc-3’
CAII	5’-tgatgactctcaggacaatgc-3’, 5’-tgttccagtgaaccaagtgaa-3’

Mucin1	5’-gtttgttttctagccccttcc-3’, 5’-atgctaaggaactgctggtgt-3’

REAL-TIME PCR PRIMER SETS (CHIP)

Rab3d +0.3kb	5’-ctagatggcccagaagagaag-3’, 5’-taaggagaacgcagccaac-3’
Htra2 +1.0kb	5’-gtagcagacattgccacactg-3’, 5’-gaagaggctccttaagggaaa-3’
Uba5 -0.3kb	5’-gtgactctggcgaatgaagac-3’, 5’-ttaatgcaggctcaaggttct-3’
Rab27a +0.7kb	5’-tggagtattcccctaggcttc-3’, 5’-tacgaaatgtctcctgccttc-3’
Abcb6 +0.3kb	5’-ccttggtgctggttcttcc-3’, 5’-atctgaagtgtggccagaaac-3’
Cx32 +0.5kb	5’-taaagcaggcatgtacccaag-3’, 5’-cggctggaatgacttttaac-3’
Atp2c2 +54.7kb	5’-gaatccctgctgtgtgtgtag-3’, 5’-agcccagtcccgtgtatatc-3’
Wdyhv1 +1.0kb	5’-cgggttgtttagttgacctgt-3’, 5’-cgctctctcaccaatagcag-3’
Copz2 +0.8kb	5’-actcggtgtccactttgagtc-3’, 5’-cttcgcccgtcattatctaag-3’
Foxp2 -0.5kb	5’-gctgtgccaatacagcatac-3’, 5’-gtttgttctgccccgtttc-3’
Slc35d1 +11.2kb	5’-agctgttggaggcttgattta-3’, 5’-cagaaggagtcttatctcccaac-3’
Gstm4 -3.7kb	5’-tctcatggcacataaatcagc-3’, 5’-gttccacatcgcacactacac-3’
Nfe2l2 -0.4kb	5’-ggcaaacagctgctaatctct-3’, 5’-cccactgttgatcctcctct-3’
Rnd2 -2.3kb	5’-gcttgccacctcgactgt-3’, 5’-gtcgcgagtctagccatgt-3’
Aldh1a1 +3.4kb	5’-aaacttgcacagcttgaggat-3’, 5’-ggcaaataaaagccaaaatga-3’
Ptgr1 -8.3kb	5’-cggatagggggagtaaaacat-3’, 5’-gagttggcctctcagactgtt-3’
Cldn10 +51.8kb	5’-gctgttgacaagtgtgtgacc-3’, 5’-tttttagaaggtccctcagca-3’
Ppap2b +27.3kb	5’-ggcctgtattcggttacaaaa-3’, 5’-gggtgctgtggataagacaac-3’
Smarca1 -2.5kb	5’-atcacttgccttgttctccaa-3’, 5’-atgattctcaacaccctggtc-3’
β-tubulin +0.1kb	5’-aacacccctcttaccctgact-3’, 5’-cctagccttgaacccaagagt-3’

Nox4 +82.2kb	5’-gattttgagccacctcatgtt-3’, 5’-aggctgctatgctgtgaagat-3’
Rnd2 +2.9kb	5’-atgttcctcccgatcttctg-3’, 5’-tacgacgtagctgcctatgg-3’