

## Key resources table

REAGENT or RESOURCE	SOURCE	IDENTIFIER
Antibodies		
phospho-AMPK $\alpha$ -T172	Cell Signaling Technology	Cat# 2535S, RRID:AB_331250
AMPK $\alpha$	Cell Signaling Technology	Cat# 2532S, RRID:AB_330331
phospho-p70 S6 Kinase	Cell Signaling Technology	Cat# 9234T, RRID:AB_2269803
S6K	Cell Signaling Technology	Cat# 9202S, RRID:AB_11179402
4E-BP1	Cell Signaling Technology	Cat# 9644S, RRID:AB_2097841
phospho-4E-BP1	Cell Signaling Technology	Cat# 2855S, RRID:AB_560835
phospho-Tuberin/TSC2	Cell Signaling Technology	Cat# 5584T, RRID:AB_10698883
Tuberin/TSC2	Cell Signaling Technology	Cat# 4308, RRID:AB_10547134
phospho-Raptor	Cell Signaling Technology	Cat# 2083T, RRID:AB_2249475
Raptor	Cell Signaling Technology	Cat# 2280S, RRID:AB_561245
phospho-Akt	Cell Signaling Technology	Cat# 4060T, RRID:AB_2315049
Akt	Cell Signaling Technology	Cat# 4691T, RRID:AB_915783
albumin	Cell Signaling Technology	Cat# 4929S, RRID:AB_2225785
mTOR	Cell Signaling Technology	Cat# 2983T, RRID:AB_2105622
Flag	Sigma-Aldrich	Cat# F1804-5MG, RRID:AB_262044
HA	Santa Cruz	Cat# sc-7392, RRID:AB_627809
AXIN	Santa Cruz	Cat# sc-8567, RRID:AB_2227789
$\beta$ -Actin	Proteintech	Cat# 66009-1-Ig, RRID:AB_2687938
TRPV6	Proteintech	Cat# 13411-1-AP, RRID:AB_2272390
TRPV4	Proteintech	Cat# 20987-1-AP, RRID:AB_10926386
TRPV1	Abcam	Cat# ab305299, RRID:AB_3105792
TRPV2	Abcam	Cat# ab272862, RRID:AB_2892218
TRPV3	Abcam	Cat# ab85022, RRID:AB_2209278
TRPV4	Abcam	Cat# ab191580
LAMP2	Abcam	Cat# ab13524, RRID:AB_2134736

HGF	ABclonal	Cat# A1193, RRID:AB_2758872
IGF-1	ABclonal	Cat# A0303, RRID:AB_2757113
hemoglobin subunit alpha (HBA1)	ABclonal	Cat# A7322, RRID:AB_2767862
hemoglobin subunit gamma (HBG1)	ABclonal	Cat# A14989, RRID:AB_2761871
erythropoietin (EPO)	ABclonal	Cat# A5663, RRID:AB_2766423
GCN5L2 (KAT2A)	Cell Signaling Technology	Cat# 3305, RRID:AB_2128281
KAT2B	Invitrogen	Cat# 703379, RRID:AB_2784580
p300	Cell Signaling Technology	Cat# 57625, RRID:AB_3068009
MYST3 (KAT6A)	Cell Signaling Technology	Cat# 78462, RRID:AB_3095769
SRC-2 (NCoA-2)	Cell Signaling Technology	Cat# 96687, RRID:AB_2800266
NCoA-1	ABclonal	Cat# A1128, RRID:AB_2758490
NCoA-3	Proteintech	Cat# 29587-1-AP, RRID:AB_2918328
TAF1 (TAFII250)	ABclonal	Cat# A15730, RRID:AB_2763145
CLOCK	ABclonal	Cat# A7265, RRID:AB_2863549
KAT6B	Abcam	Cat# ab246879, RRID:AB_3331660
GTF3C1	Proteintech	Cat# 31679-1-AP, RRID:AB_3670073
KAT5	ABclonal	Cat# A1678, RRID:AB_2763733
KAT7	ABclonal	Cat# A5823, RRID:AB_2766575
ATF2	ABclonal	Cat# A22718
KAT1	ABclonal	Cat# A4423, RRID:AB_2863271
Ubiquitin	Abcam	Cat# ab134953, RRID:AB_2801561
Phospho-CREB (Ser133)	Proteintech	Cat# 28792-1-AP, RRID:AB_2918203
CREB	Cell Signaling Technology	Cat# 9197, RRID:AB_331277
Phospho-Acetyl-CoA Carboxylase (Ser79)	Cell Signaling Technology	Cat# 3661, RRID:AB_330337
Acetyl-CoA Carboxylase	Cell Signaling Technology	Cat# 3662, RRID:AB_2219400
Phospho-TFEB (Ser122)	Cell Signaling Technology	Cat# 87932, RRID:AB_3696733
TFEB	Cell Signaling Technology	Cat# 83010, RRID:AB_3105800

SirT7	Cell Signaling Technology	Cat# 5360, RRID:AB_2716764
SirT2	Cell Signaling Technology	Cat# 12650, RRID:AB_2716762
Ki-67	Thermo Fisher Sci.	Cat# MA5-14520, RRID:AB_10979488
HRP-conjugated goat anti-mouse IgG antibody	Jackson ImmunoResearch	cat. 115-035-003; RRID: AB_10015289
HRP-conjugated goat anti-rabbit IgG antibody	Jackson ImmunoResearch	cat. 111-035-003; RRID: AB_2313567
Alexa Fluor 488 goat anti-rabbit IgG antibody	Molecular Probes	cat. A-11034, RRID:AB_2576217
Alexa Fluor 594 donkey anti-rat IgG antibody	Molecular Probes	cat. A-21209, RRID:AB_2535795
Bacterial and virus strains		
Stbl3	Thermo Fisher Sci.	Cat# C737303
BL21	Invitrogen	Cat# C609601
Biological samples		
Foetal liver tissues from voluntarily terminated the pregnancy and adult liver adjacent tissue of benign lesions from surgery	Obstetrics and Gynecology Hospital of Fudan University	See Table S2 for details
Chemicals, peptides, and recombinant proteins		
Glucose	Sigma-Aldric	Cat# G7021-1Kg
BCTC	MedChemExpress	Cat# HY-19960
GSK101	Sigma-Aldric	Cat# G0798-10MG
Concanamycin A	Sigma-Aldric	Cat# C9705
Dulbecco's modified Eagle's medium	Gibco	Cat# 11960044
DMEM/F12	Gibco	Cat# 11320033
Glucose-free DMEM	Gibco	Cat# 11966
ITS Liquid media supplement	Sigma	Cat# I3146
CaCl <sub>2</sub>	Sango Biotech	Cat# A610050-0500
MgSO <sub>4</sub> .7H <sub>2</sub> O	Sigma	Cat# M1880-500G
KCl	Sango Biotech	Cat# A100395
NaHCO <sub>3</sub>	Sango Biotech	Cat# A500873-0500
NaCl	Sango Biotech	Cat# A610476
NaH <sub>2</sub> PO <sub>4</sub> .H <sub>2</sub> O	Sango Biotech	Cat# A100823
FBP	Sigma	Cat# 38099-82-0
Glucose	Sigma	Cat# G7021-1Kg
MEM Amino Acids	Gibco	Cat# 11130-051
MEM Non-essential Amino Acid solution	Sigma	Cat# M7145
DMEM medium	Gibco	Cat# 11966025
High-glucose DMEM	Gibco	Cat# 11960044
William's medium E	Gibco	Cat# 12551032
Insulin	Procell	Cat# PB180432
BamHI	NEW ENGLAND Biolabs	Cat# R3136L
XhoI	NEW ENGLAND Biolabs	Cat# R0146L

OPTI-MEM	Gibco	Cat# 31985070
FBS	Gibco	Cat# 10099158
GlutaMAX™	Gibco	Cat# 35050061
Sodium pyruvate solution	Sigma	Cat# S8636-100ML
Coomassie Brilliant Blue	Sigma	Cat# C.I.42660B0149
5-kDa cutoff filter	PALL	Cat# OD003C34
Snap cap	Agilent	Cat# 5042-6491
TRIzol™ LS Reagent	Thermo Fisher Scientific	Cat# 10296010
Protease inhibitor cocktail	Roche	Cat# 04693116001
Lipofectamine 2000	Invitrogen	Cat# 11668-027
DEPC-treated water	Invitrogen	Cat# AM9922
Triton X-100	Sigma	Cat# T9284
HEPES	Gibco	Cat# 21063
Polyethylenimine	Polysciences	Cat# 23966
Lysosensor™ Green DND-189	Thermo Fisher	Cat# L7535
CELLSAVING™	New Cell & Molecular Biotech	Cat# C40050
Dimethyl sulfoxide	Sigma	Cat# D2650
Rapamycin	MedChemExpress	Cat# HY-10219
IPTG	Beyotime	Cat# ST1416
L-glutathione reduced	Sigma	Cat# G6013
Hoechst	Sigma	Cat# B2261-100MG
Glucagon (1-29)	MedChemExpress	Cat# HY-P0082
Cycloheximide	MedChemExpress	Cat# HY-12320
MG132	MedChemExpress	Cat# HY-13259
MK-8722	MedChemExpress	Cat# HY-111363
BAY-3827	MedChemExpress	Cat# HY-112083
<b>Critical commercial assays</b>		
Insulin ELISA assay kit	Sango Biotech	Cat# D721101-0096
IGF-1 ELISA assay kit	Sango Biotech	Cat# D721014-0096
IGF-2 ELISA assay kit	Sango Biotech	Cat# D721101-0096
Mouse Glucagon ELISA Kit	Crystal Chem	Cat# 81518
Ezview™ red anti-HA affinity gel	Sigma	Cat# E6779
Dynabeads Protein G	Thermo Fisher Sci	Cat# 10003
Pierce™ BCA Protein Assay Kits	Thermo Fisher Scientific	Cat# 23225
TB Green® Premix Ex Taq™ II (Tli RNaseH Plus)	Takara	Cat# RR820A
<b>Deposited data</b>		
Raw sequencing reads of RNAseq data of BNL_CL2 cells	This paper	Sequence Read Archive database via accession number PRJNA1171108
The MS proteomics Raw data	This paper	iProX partner repository with the dataset identifier IPX0009924000
<b>Experimental models: Cell lines</b>		

Human: HEK293T cells	ATCC	CRL3216; RRID: CVCL_0063
BNL-CL2	Cell Bank, Chinese Academy of Sciences	Cat# GNM22
AML12	Procell Life Science & Technology	Cat# CL-0602
Mouse: primary hepatocytes from C57BL/6J mice	The Jackson Laboratory	Stock No: 000664 Black. 6
Experimental models: Organisms/strains		
C57BL/6J male and female Mice (10-week sold)	The Jackson Laboratory	Stock No: 000664 Black. 6
Mouse: <i>Raptor</i> <sup>F/F</sup>	The Jackson Laboratory	Stock No: 013191
Mouse: <i>Alb-Cre</i>	The Jackson Laboratory	Stock No: 003574
Mouse: TRPV4 Knock-in strain	Shanghai Model Organisms	Cat# N7-100246
Mouse: TRPV4-K608R Knock-in strain	Shanghai Model Organisms	Cat# N7-100247
Oligonucleotides		
Primer: 5'-CTCAGTAGTGGTATGTGCTCAG-3' and 5'-GGGTACAGTATGTCAGCACAG-3' for Raptor LoxP	This paper	N/A
Primer: 5'-ATGAAATGCGAGGTAAGTATGG-3' and 5'-CGCCGCATAACCAGTCAAAC-3' for Alb-Cre	This paper	N/A
Primer I: 5'-TCAGATTCTTTTATAGGGGACACA-3' and 5'-TAAAGGCCACTCAATGCTCACTAA-3' for TRPV4-K608R-LKI	This paper	N/A
Primer II: 5'-CCTGTGTGCCATGGTCATCT-3' and 5'-CAGGAGGAAGGTGCTGAAGG-3' for TRPV4-K608R-LKI	This paper	N/A
Primer I: 5'-TCAGATTCTTTTATAGGGGACACA-3' and 5'-TAAAGGCCACTCAATGCTCACTAA-3' for TRPV4-WT-LKI	This paper	N/A
Primer II: 5'-GGGTGGGGTTGGGAAATCTT-3' and 5'-TAGGGGGCGTACTTGGCATA-3' for TRPV4-WT-LKI	This paper	N/A
Primer: 5'-AGAGAATTCGGATCCATGGCGGATTCCAGCGAAGG-3' and 5'-CTTCCATGGCTCGAGCTAGAGCGGGGCATCAG-3' for TRPV4 cloning	This paper	N/A
Primer: 5'-AGCATCATGATCCAGAGGATTCTCTTCAAGGAC-3' and 5'-GTCCTTGAAGAGAATCCTCTGGATCATGATGCT-3' for TRPV4 K608R mutation	This paper	N/A

Primer: 5'-gatctagagaattcggatcc-3' and 5'-aagcttccatggctcgag-3' for homologous fragment	This paper	N/A
Primer: 5'-ctagagaattcggatccATGGCCGAGAATGTG GTGGAAC-3' and 5'-agcttccatggctcgagCTAGTGTATGTCTAGT GTA CTC-3' for p300 cloning	This paper	N/A
Primer: 5'-ATCTGGTTCCGCGTGGATCCatggcggattc cagcgaagg-3' and 5'-CGAGTCGACCCGGAATTCctagagcgggg cgtcatcagtc-3' for pGEX-TRPV4 cloning	This paper	N/A
Primer: 5'-AGAGAATTCGGATCCATGGCGCAGACG CAGGGC-3' and 5'-CTTCCATGGCTCGAGGGCCA ACTTGAC CTCTCC-3' for HDAC1	This paper	N/A
Primer: 5'-AGAGAATTCGGATCCATGGCGTACAGT CAAGGAGG-3' and 5'-CTTCCATGGCTCGAGGGGGTTGCTGAG CTGTTCTG-3' for HDAC2	This paper	N/A
Primer: 5'-AGAGAATTCGGATCCATGGCCAAGACC GTGGCCTA-3' and 5'-CTTCCATGGCTCGAGAATCTCCACATCG CTTTCCTG-3' for HDAC3	This paper	N/A
Primer: 5'-AGAGAATTCGGATCCATGAGCTCCCAA GCCATCC-3' and 5'-CTTCCATGGCTCGAGCAGGGGCGGCTC CTCTTC-3' for HDAC4	This paper	N/A
Primer: 5'-AGAGAATTCGGATCCATGAACTCTCCCA ACGAGTCGGCAG-3' and 5'-CTTCCATGGCTCGAGTCACAGGGCAGG CTCTGCTCCATGG-3' for HDAC5	This paper	N/A
Primer: 5'-AGAGAATTCGGATCCATGACCTCAACC GGCCAGGA-3' and 5'-CTTCCATGGCTCGAGGTGTGGGTGGGG CATATCCT-3' for HDAC6	This paper	N/A
Primer: 5'-AGAGAATTCGGATCCATGCACAGCCCC GCGCTGATGGGAC-3' and 5'-CTTCCATGGCTCGAGTTAGAGATTCATA GTTCTTCCTCCT-3' for HDAC7	This paper	N/A
Primer: 5'-AGAGAATTCGGATCCATGGAGGAGCCG GAGGAAC-3' and 5'-CTTCCATGGCTCGAGGACCACATGCTT CAGATTCC-3' for HDAC8	This paper	N/A

Primer: 5'- AGAGAATTCGGATCCATGCACAGTATGA TCAGCTCA-3' and 5'- CTTCCATGGCTCGAGAGAGAACTTTAAA GACATACTT-3' for HDAC9	This paper	N/A
Primer: 5'- AGAGAATTCGGATCCATGGGGACCGCG CTTGTGTA-3' and 5'- CTTCCATGGCTCGAGAGCCACCAGGTG AGGATGG-3' for HDAC10	This paper	N/A
Primer: 5'- AGAGAATTCGGATCCATGCTACACACAA CCCAGCT-3' and 5'- CTTCCATGGCTCGAGGGGCACTGCAGG GGGAAG-3' for HDAC11	This paper	N/A
Primer: 5'- AGAGAATTCGGATCCatggcagagccagacc ctctc-3' and 5'- CTTCCATGGCTCGAGtactgggtttctccctc ct-3' for Sirt2	This paper	N/A
Primer: 5'- AGAGAATTCGGATCCatggcagccgggggtctg agccgct-3' and 5'- CTTCCATGGCTCGAGttacgtcactttctcttttg tgc-3' for Sirt7	This paper	N/A
Primer: 5'- GGATCCGCGtGtGAAtAttCAtCtAAAttcaag agaTTTAGATGAATATTCAACACGTTTTG AATTC-3' and 5'- GAATTCAAACGTGTTGAATATTCATCTA AAtctcttgaaTTTaGaTGaaTaTTCaaCaCGC GGATCC-3' for Hat1 shRNA-1	This paper	N/A
Primer: 5'- GGATCCGCGtAGCAGAGtACAAGtGtAACTtc aagagaGTTACACTTGTACTCTGCTAGTTT TGAATTC-3' and 5'- GAATTCAAACACTAGCAGAGTACAAGTGT AACTctcttgaaGTTaCaCTTGTaCTCTGCTa GCGGATCC -3' for Hat1 shRNA-2	This paper	N/A
Primer: 5'- GGATCCGCGtGtGAAtAttCAtCtAAAttcaag agaTTTAGATGAATATTCAACACGTTTTG AATTC-3' and 5'- GAATTCAAACGAGTCGACTACCAAGTGA TGAAtctcttgaaTCaTCaCTGGTaGTcGaCTC GCGGATCC-3' for Atf2 shRNA-1	This paper	N/A
Primer: 5'- GGATCCGCGAGTCGACTACCAAGTATG AttcaagagaTCATCACTGGTAGTCGACTC GTTTTGAATTC-3' and 5'- GAATTCAAACGAGTCGACTACCAAGTGA TGAAtctcttgaaTCATCACTGGTAGTCGACT CGCGGATCC-3' for Atf2 shRNA-2	This paper	N/A

Primer: 5'- GGATCCGAGACTGTTCTACCAAATAACT tcaagagaAGTTATTTGGTAGAACAGTCTT TTTGAATTC-3' and 5'- GAATTCAAAAAGACTGTTCTACCAAATA ACTtctcttgaaAGTTATTTGGTAGAACAGTC TCGGATCC-3' for Ep300 shRNA-1	This paper	N/A
Primer: 5'- GGATCCGGGATTAAGTTTGATAAATAGC tcaagagaGCTATTTATCAAACCTTAATCCT TTTGAATTC-3' and 5'- GAATTCAAAAGGATTAAGTTTGATAAATA GCtctcttgaaGCTATTTATCAAACCTTAATCC CGGATCC-3' for Ep300 shRNA-2	This paper	N/A
Primer: 5'- GGATCCGGATGAATTAATCAACTCTACAt tcaagagaTGTAGAGTTGATTAATTCATCTT TTGAATTC-3' and 5'- GAATTCAAAAGATGAATTAATCAACTCTA CAtctcttgaaTGTAGAGTTGATTAATTCATC CGGATCC-3' for Ep300 shRNA-3	This paper	N/A
Primer: 5'- GGATCCGGAGCATGGTCAATAGTTTAC CTTCAAGAGAGGTAAACTATTGACCATG CTCTTTTGAATTC-3' and 5'- GAATTCAAAAGAGCATGGTCAATAGTTT ACCTCTTTGAAGGTAAACTATTGACCA TGCTCCGGATCC-3' for CBP shRNA-1	This paper	N/A
Primer: 5'- GGATCCGGCATGAATGCTAACTTCAACC tcaagagaGGTTGAAGTTAGCATTTCATGCT TTTGAATTC-3' and 5'- GAATTCAAAAGCATGAATGCTAACTTCA ACCtctcttgaaGGTTGAAGTTAGCATTTCAT GCCGGATCC-3' for CBP shRNA-2	This paper	N/A
Primer: 5'- GGATCCGGGACAGCTCAGATGGAATAC CttcaagagaGGTATTCCATCTGAGCTGTC CTTTTGAATTC-3' and 5'- GAATTCAAAAGGACAGCTCAGATGGAAT ACCtctcttgaaGGTATTCCATCTGAGCTGT CCCGGATCC-3' for Kat5 shRNA-1	This paper	N/A
Primer: 5'- GGATCCGGGACTTAAAGAAGATCCAATT tcaagagaAATTGGATCTTCTTTAAGTCCT TTTGAATTC-3' and 5'- GAATTCAAAAGGACTTAAAGAAGATCCA ATTtctcttgaaAATTGGATCTTCTTTAAGTC CCGGATCC-3' for Kat5 shRNA-2	This paper	N/A
Primer: 5'- GGATCCGCGATTTTCAGTTATTTGTTATCt tcaagagaGATAACAAATAACTGAAATCGT TTTGAATTC-3' and 5'- GAATTCAAAACGATTTTCAGTTATTTGTTA TCtctcttgaaGATAACAAATAACTGAAATCG CGGATCC-3' for Kat6a shRNA-1	This paper	N/A

Primer: 5'- GGATCCGGCATCAAGAAGCTGAGCAAG CttcaagagaGCTTGCTCAGCTTCTTGATG CTTTTGAATTC-3' and 5'- GAATTCAAAGCATCAAGAAGCTGAGCA AGCtctcttgaaGCTTGCTCAGCTTCTTGAT GCCGGATCC-3' for Kat6a shRNA-2	This paper	N/A
Primer: 5'- GGATCCGCAACGATTGTTGTCTGTAACC ttcaagagaGGTTACAGACAACAATCGTTG TTTTGAATTC-3' and 5'- GAATTCAAACAACGATTGTTGTCTGTA ACCtctcttgaaGGTTACAGACAACAATCGT TGCGGATCC-3' for Kat6b shRNA-1	This paper	N/A
Primer: 5'- GGATCCGAGTTGTTAGAGCTGTCCAAA GttcaagagaCTTTGGACAGCTCTAACAAC TTTTTGAATTC-3' and 5'- GAATTCAAAGTTGTTAGAGCTGTCCA AAGtctcttgaaCTTTGGACAGCTCTAACA CTCGGATCC-3' for Kat6b shRNA-2	This paper	N/A
Primer: 5'- GGATCCGACAGGAATATGCAAGATTAC CttcaagagaGGTAATCTTGCATATTCCTGT TTTTGAATTC-3' and 5'- GAATTCAAACAGGAATATGCAAGATT ACCtctcttgaaGGTAATCTTGCATATTCCTG TCGGATCC-3' for Kat6b shRNA-3	This paper	N/A
Primer: 5'- GGATCCGGGCAGTAGTTCAGATGGAAC CttcaagagaGGTTCCATCTGAACTACTGC CTTTTGAATTC-3' and 5'- GAATTCAAAGGCAGTAGTTCAGATGGA ACCtctcttgaaGGTTCCATCTGAACTACTG CCCGGATCC-3' for Kat7 shRNA-1	This paper	N/A
Primer: 5'- GGATCCGCGAGCATAACAGACAGTTCAG AttcaagagaTCTGAACTGTCTGTATGCTCG TTTTGAATTC-3' and 5'- GAATTCAAACGAGCATAACAGACAGTTC AGAtctcttgaaTCTGAACTGTCTGTATGCT CGCGGATCC-3' for Kat7 shRNA-2	This paper	N/A
Primer: 5'- GGATCCGGGAAGACCTAGTAAGGAAG TttcaagagaACTTCCTTACTAGGTCTTCCC TTTTGAATTC-3' and 5'- GAATTCAAAGGAAGACCTAGTAAGG AAGTtctcttgaaACTTCCTTACTAGGTCTTC CCCGGATCC-3' for Nco-1 shRNA-1	This paper	N/A
Primer: 5'- GGATCCGAGTAGATCAGATACAGCTAAT ttcaagagaATTAGCTGTATCTGATCTACTT TTTGAATTC-3' and 5'- GAATTCAAAGTAGATCAGATACAGCT AATtctcttgaaATTAGCTGTATCTGATCTAC TCGGATCC-3' for Nco-1 shRNA-2	This paper	N/A

Primer: 5'- GGATCCGCCTATAGATTCATATTGAATGt tcaagagaCATTCAATATGAATCTATAGGTT TTGAATTC-3' and 5'- GAATTCAAACCTATAGATTCATATTGAA TGtctcttgaaCATTCAATATGAATCTATAGG CGGATCC-3' for Nco-1 shRNA-3	This paper	N/A
Primer: 5'- GGATCCGGATCAAAGAGCAAGAGAAAG CttcaagagaGCTTTCTCTTGCTCTTTGATC TTTTGAATTC-3' and 5'- GAATTCAAAGATCAAAGAGCAAGAGAA AGCtctcttgaaGCTTTCTCTTGCTCTTTGAT CCGGATCC-3' for Nco-2 shRNA-1	This paper	N/A
Primer: 5'- GGATCCGGGTTCTTCTTCGTTGTGAACC tcaagagaGGTTCACAACGAAGAAGAACC TTTTGAATTC-3' and 5'- GAATTCAAAGGTTCTTCTTCGTTGTGA ACCtctcttgaaGGTTCACAACGAAGAAGAA CCCGGATCC-3' for Nco-2 shRNA-2	This paper	N/A
Primer: 5'- GGATCCGGCGACATCGACAACCTTCAAT GttcaagagaCATTGAAGTTGTCGATGTCG CTTTTGAATTC-3' and 5'- GAATTCAAAGCGACATCGACAACCTTCA ATGtctcttgaaCATTGAAGTTGTCGATGTC GCCGGATCC-3' for Nco-3 shRNA-1	This paper	N/A
Primer: 5'- GGATCCGGGAGACAGTGAGACAGATAC GttcaagagaCGTATCTGTCTCACTGTCTC CTTTTGAATTC-3' and 5'- GAATTCAAAGGAGACAGTGAGACAGA TACGtctcttgaaCGTATCTGTCTCACTGTCT CCCGGATCC-3' for Nco-3 shRNA-2	This paper	N/A
Primer: 5'- GGATCCGGGATGAGTGGACTAGGCGAA AttcaagagaTTTCGCCTAGTCCACTCATCC TTTTGAATTC-3' and 5'- GAATTCAAAGGATGAGTGGACTAGGC GAAAtctcttgaaTTTCGCCTAGTCCACTCAT CCCGGATCC-3' for Nco-3 shRNA-3	This paper	N/A
Primer: 5'- GGATCCGGGACAAGTCTACTGTTCTACA ttcaagagaTGTAGAACAGTAGACTTGTCCCT TTTGAATTC-3' and 5'- GAATTCAAAAAGTTCAATGTCCTCATTA GGtctcttgaaCCTTAATGAGGACATTGAAC TCGGATCC-3' for Clock shRNA-1	This paper	N/A
Primer: 5'- GGATCCGGGACAAGTCTACTGTTCTACA ttcaagagaTGTAGAACAGTAGACTTGTCCCT TTTGAATTC-3' and 5'- GAATTCAAAAAGGACAAGTCTACTGTTCT ACAAtctcttgaaTGTAGAACAGTAGACTTGT CCCGGATCC-3' for Clock shRNA-2	This paper	N/A

Primer: 5'- GGATCCGGACAGATGGAAGTATAATATA ttcaagagaTATATTATACTTCCATCTGTCTT TTGAATTC-3' and 5'- GAATTCAAAGACAGATGGAAGTATAAT ATAtctcttgaaTATATTATACTTCCATCTGT CCGGATCC-3' for Clock shRNA-3	This paper	N/A
Primer: 5'- GGATCCGGATGCTGATTGTGAAGATATT ttcaagagaAATATCTTCACAATCAGCATCT TTTGAATTC-3' and 5'- GAATTCAAAGATGCTGATTGTGAAGAT ATTtctcttgaaAATATCTTCACAATCAGCAT CCGGATCC-3' for Taf1 (TAFII250) shRNA-1	This paper	N/A
Primer: 5'- GGATCCGGCAGAAGATGAAAGTAGAAG AttcaagagaTCTTCTACTTTTCATCTTCTGC TTTTGAATTC-3' and 5'- GAATTCAAAGCAGAAGATGAAAGTAGA AGAtctcttgaaTCTTCTACTTTTCATCTTCTG CCGGATCC-3' for Taf1 (TAFII250) shRNA-2	This paper	N/A
Primer: 5'- GGATCCGGAGAGGATGCTGTGGACTAT TttcaagagaAATAGTCCACAGCATCCTCTC TTTTGAATTC-3' and 5'- GAATTCAAAGAGAGGATGCTGTGGAC TATTtctcttgaaAATAGTCCACAGCATCCTC TCCGGATCC-3' for Taf1 (TAFII250) shRNA-3	This paper	N/A
Primer: 5'- ggatccGGGACGTTTCCTGGACTACATCCttc aagagaGGATGTAGTCCAGGAACGTCCTT TTgaattc-3' and 5'- gaattcAAAAGGACGTTTCCTGGACTACATC CtctcttgaaGGATGTAGTCCAGGAACGTC Cggatcc-3' for Gtf3c1 shRNA-1	This paper	N/A
Primer: 5'- ggatccGAGAGAATGTTGGTGTCTCAGGttc aagagaCCTGAGACACCAACATTCTCTTT TTgaattc-3' and 5'- gaattcAAAAAGAGAATGTTGGTGTCTCAG GtctcttgaaCCTGAGACACCAACATTCTCT Cggatcc-3' for Gtf3c1 shRNA-2	This paper	N/A
Primer: 5'- ggatccGAGAGCACTGTCACCTTCTATG ttcaagagaCATAGAAGGTGACAGTGCTCT TTTTgaattc-3' and 5'- gaattcAAAAAGAGCACTGTCACCTTCTAT GtctcttgaaCATAGAAGGTGACAGTGCTCT Cggatcc-3' for Gtf3c1 shRNA-3	This paper	N/A

Primer: 5'- ACCGGTGGGTCAGTGCAACAGTTGTAC CttcaagagaGGTACAACACTGTTGCACTGAC CTTTTGGATCC-3' and 5'- GGATCCAAAAGGTCAGTGCAACAGTTG TACCtctcttgaaGGTACAACACTGTTGCACTG ACCCACCGGT-3' for Kat2a shRNA-1	This paper	N/A
Primer: 5'- ACCGGTGCAGACACCAAACAAGTCTATT ttcaagagaAATAGACTTGTGGTGTCTGT TTTGGATCC-3' and 5'- GGATCCAAAACAGACACCAAACAAGTCT ATTtctcttgaaAATAGACTTGTGGTGTCT GCACCGGT-3' for Kat2a shRNA-2	This paper	N/A
Primer: 5'- ACCGGTGGGATGTCGCTACCTACAAAG TttcaagagaACTTTGTAGGTAGCGACATC CTTTT GGATCC-3' and 5'- GGATCCAAAAGGATGTCGCTACCTACAA AGTtctcttgaaACTTTGTAGGTAGCGACAT CCCACCGGT-3' for Kat2a shRNA-3	This paper	N/A
Primer: 5'- ACCGGTGGGTCAGTGCAACAGTTGTAC CttcaagagaGGTACAACACTGTTGCACTGAC CTTTTGGATCC-3' and 5'- GGATCCAAAAGGTCAGTGCAACAGTTG TACCtctcttgaaGGTACAACACTGTTGCACTG ACCCACCGGT-3' for Kat2b shRNA-1	This paper	N/A
Primer: 5'- ACCGGTGGCAGTTCTGTGACAGCTTAC CttcaagagaGGTAAGCTGTCACAGAACTG C GGATCC-3' and 5'- GGATCCGCAGTTCTGTGACAGCTTACct ctcttgaaGGTAAGCTGTCACAGAACTGCC ACCGGT-3' for Kat2b shRNA-2	This paper	N/A
Primer: 5'-AGCTTGTCAACCGGAAG- 3' and 5'-TTTGATGTTAGTGGGGTCTCG- 3' for GAPDH	Israelsen, W. J. et al., 2013	N/A
Primer: 5'-CCGGCTTTTTGGGAAGGGT-3' and 5'-GAGACAGGTAGGTCCATCCAC-3' for mTrpv1	Li et al., 2019	N/A
Primer: 5'-GGACCCAAATCGGTTTGACC- 3' and 5'-GCGCAGGTACTCTAGCAGTC-3' for mTrpv2	Li et al., 2019	N/A
Primer: 5'-ACGGTCACCAAGACCTCTC-3' and 5'-GACTGTTGGGATTGGATGGGG-3' for mTrpv3	Li et al., 2019	N/A
Primer: 5'- AAACCTGCGTATGAAGTTCCAG-3' and 5'-CCGTAGTCGAACAAGGAATCCA -3' for mTrpv4	Li et al., 2019	N/A
Primer: 5'-TGCTG CTATAATGCTGATGGAG-3' and 5'- GCACGGACTAGGTTACATTCT -3' for mTrpv5	Li et al., 2019	N/A

Primer: 5'-GACCAGACACCTGTAAAGGAAC-3' and 5'-AGACACAGCACATGGTAAAGC-3' for mTrpv6	Li et al., 2019	N/A
Recombinant DNA		
pBOBI vector	Miyoshi et al., 1998	N/A
pcDNA3.3 vector	Thermo Fisher	cat. K830001
pGEX-4T-1	Addgene	plasmid # 27458001
CMV-GCaMP6s	Addgene	plasmid # 40753
pLVX-shRNA2-zsGreen-PGK-puro	Addgene	plasmid # 197991
Software and algorithms		
GraphPad Prism version 9	Graphpad Software Inc	<a href="https://www.graphpad.com/scientificsoftware/prism/">https://www.graphpad.com/scientificsoftware/prism/</a>
StepOne software version 2.3	Applied Biosystems	<a href="https://www.thermofisher.com">https://www.thermofisher.com</a>
Zen 2012	Zeiss	<a href="https://www.zeiss.com">https://www.zeiss.com</a>
Fiji	National Institutes of Health	<a href="https://imagej.net/software/fiji/">https://imagej.net/software/fiji/</a>
SPSS Statistics 17.0	IBM	<a href="https://www.ibm.com">https://www.ibm.com</a>
Qualitative Analysis B.06.00	Agilent	<a href="https://www.agilent.com">https://www.agilent.com</a>