

**Table S1:** List of antibodies used for immunostaining (IC), ELISA, and ChIP-seq (ChIP) in organoid experiment.

Antibody	Host	Source	Catalog #	Dilution	Method
EP300 ChIP Grade	Rabbit	abcam	ab14984	5 $\mu$ g	ChIP
ACSS2	Rabbit	abcam	ab66038	5 $\mu$ g	ChIP
ALDH6A1	Rabbit	abcam	Ab126218	5 $\mu$ g	ChIP
CPS1	Rabbit	abcam	ab45956	1:200	IF
ACSS2	Mouse	Sigma-Aldrich	SAB1401767	1:200	IF
GLUL	Mouse	Sigma-Aldrich	MAB302	1:200	IF, IHC
GLUL	Mouse	abcam	ab273647	1:200	IF
NR3C1	Rabbit	Invitrogen	PA1-511A	1:200	IF
CDH1	Goat	R&D	AF648	1:200	IF
ZO-1	Mouse	BD Biosciences	610966	1:200	IF
CTNNB1	Rabbit	Santa Cruz	sc-7199	1:200	IF
MRP2	Rabbit	Santa Cruz	Sc-20766	1:200	IF, IHC
TUBA1A	Mouse	abcam	ab11304	1:200	IF, IHC
SLBP	Rabbit	Atlas	HPA061670	1:200	IF, IHC
CK7	Mouse	abcam	ab9021	1:200	IF, IHC
ARG1	Rabbit	abcam	ab91279	1:200	IF, IHC
ARG1	Rabbit	abcam	ab133543	1:200	IF
TERT	Rabbit	abcam	ab32020	1:200	IF, IHC
AHR	Rabbit	Atlas	HPA029723	1:200	IF, IHC
ALDH6A1	Mouse	Novus	NBP2-52410	1:200	IF
HNF4A	Rabbit	Abcam	ab200142	1:200	IF
GLS2	Rabbit	Atlas	HPA038608	1:200	IF, IHC
PROX1	Goat	R&D	AF2727	1:200	IF
A1AT	Rabbit	Atlas	HPA000927	1:200	IF

CEBPB	Mouse	Santa Cruz	Sc-7962	1:200	IF
AR	Mouse	Agilent	M3562	1;200	IF
GHR	Rabbit	Atlas	HPA057705	1:200	IF
TET1	Mouse	GeneTex	GTX627420	1:200	IF
mCherry	Rabbit	abcam	ab167453	1:200	IF
ALB	Mouse	R&D	MAB1455	1:200	IF
ALB	Goat	Bethyl	A80-129A	1 $\mu$ g	ELISA
HNF1A	Rabbit	Atlas	HPA035231	1:200	IF
normal IgG control	Rabbit	abcam	ab37415	5 $\mu$ g	ChIP

**Table S2:** List of TaqMan probes used for qPCR

Gene	Gene name	TaqMan probe (Catalog #)
<i>ACSS2</i>	Acyl-coenzyme A synthetase short-chain family member 2	Hs01122829_m1
<i>ALB</i>	Albumin	Hs00609411_m1
<i>FAH</i>	Fumarylacetoacetate hydrolase	Hs00164611_m1
<i>ASL</i>	Argininosuccinate lyase	Hs00902699_m1
<i>CPS1</i>	Carbamoyl phosphate synthase	Hs00157048_m1
<i>OTC</i>	Ornithine transcarbamylase	Hs00166892_m1
<i>ALDH1A2</i>	Aldehyde dehydrogenase 1 family member A2	Hs00180254_m1
<i>ALDH6A1</i>	Aldehyde dehydrogenase 6 family member A1	Hs00194421_m1
<i>GLUL</i>	Glutamine synthetase	Hs00365928_g1
<i>HIF1A</i>	Hypoxia-inducible factor 1-alpha	Hs00153153_m1
<i>SREBF1</i>	Sterol regulatory element-binding protein 1	Hs02561944_s1
<i>ARG1</i>	Arginase 1	Hs00163660_m1
<i>GSTA2</i>	Glutathione S-transferase A2	Hs00747232_mH

**Table S3:** List of Custom primers used for ChIP-PCR

Orientation	Sequence
Forward <i>ACSS2</i>	CTGGGGTGTTCAGTGAGGAGAA
Reverse <i>ACSS2</i>	TTCACTCTCTTGGCCGACCT
Forward <i>ALDH6A1</i>	GGTCCGAACACCTGATTCCT
Reverse <i>ALDH6A1</i>	CCTTACGCGGATGTTGAGGT

**Table S4:** List of Custom primers used for ChIP-qPCR

Orientation	Sequence
Forward <i>ACSS2</i>	GGAGGTTCTGTGAAGGAAGAAT
Probe <i>ACSS2</i>	/56-FAM/AAAGGGATT/ZEN/CCGGGAGGAGACGAG/3IABkFQ/
Reverse <i>ACSS2</i>	CTCCAAGTCTGCAGGGAAC
Forward <i>ALDH6A1</i>	GTAGGCGGAGGTAGAGAAGA
Probe <i>ALDH6A1</i>	/56-FAM/CCTGACTTG/ZEN/GACACTCCCTACCGA/3IABkFQ/

Reverse <i>ALDH6A1</i>	CAATCGGAGTTCCAGGTTAGG
------------------------	-----------------------