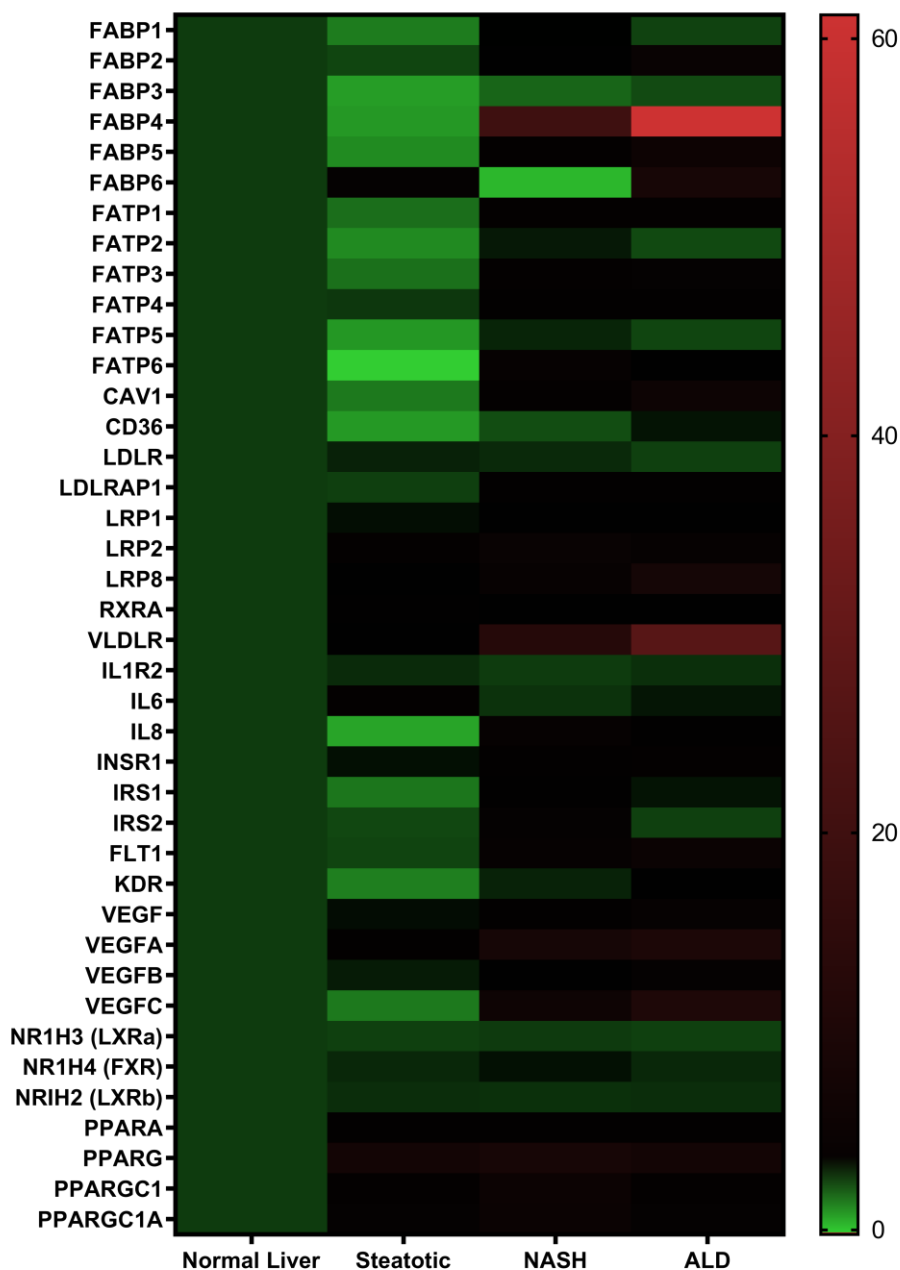


**Supplementary Figure 1 PCLS cut from normal liver tissue exhibit consistency in performance but a gradual decline in viability over time in static culture.** A: XY scatter plot of typical slice weights of PCLS cut from 6 different liver specimens, with mean mean  $\pm$  SEM of cohort indicated. B: Viability of PCLS in culture using the MTT assay. MTT signal was normalized per 500 mg of tissue and data is represented as % viability compared to control at 0 hours. Data generated from  $n = 4$  normal livers samples with 27 slices in total  $\pm$  SEM. Significance represented as  $***P < 0.001$  paired  $t$  test. C: representative images of PCLS from a donor liver after 24 h in control media or media containing 250  $\mu\text{mol/L}$  Oleic acid. Original magnification 20  $\times$ .



**Supplementary Figure 2 Analysis of gene expression by quantitative qPCR analysis.** mRNA expression of indicated genes in whole liver RNA from normal, steatotic, NASH, and ALD livers using fluidigm qPCR array®, run on triplicate arrays. Results are expressed as the mean fold change in gene expression normalized to pooled endogenous controls  $\beta$ -actin and GAPDH relative to normal livers defined as 1. Data are averaged from five normal l, four steatotic, three NASH, and four ALD livers and magnitude of gene expression response is indicated by the colour scale to the left of the heatmap. Raw data can be found in Supplementary Table 3.

**Supplementary Table 1 Probe identifiers for Fluidigm® 96.96 Dynamic Array™ and Agilent microarrays**

<b>Gene</b>	<b>Gene symbol</b>	<b>Taqman Assay ID</b>	<b>Agilent Probe ID</b>
<i>GLUT1</i>	SLC2A1	Hs00892681_m1*	A_23_P571
<i>GLUT2</i>	SLC2A2	Hs01096904_m1*	A_24_P405705
<i>GLUT3</i>	SLC2A3	Hs00359840_m1*	A_24_P81900
<i>GLUT4</i>	SLC2A4	Hs00168966_m1*	A_32_P151263
<i>GLUT5</i>	SLC2A5	Hs00161720_m1*	A_24_P111054
<i>GLUT6</i>	SLC2A6	Hs01115485_m1*	A_23_P169249
<i>GLUT7</i>	SLC2A7	Hs01013553_m1*	-
<i>GLUT8</i>	SLC2A8	Hs00205863_m1*	A_24_P175435
<i>GLUT9</i>	SLC2A9	Hs01115485_m1*	A_24_P118211
<i>GLUT10</i>	SLC2A10	Hs00368843_m1*	A_24_P271323
<i>GLUT11</i>	SLC2A11	Hs00368843_m1*	A_23_P404565
<i>GLUT12</i>	SLC2A12	Hs00376943_m1*	A_23_P395001
<i>GLUT13</i>	SLC2A13	Hs00369423_m1*	A_23_P10211
<i>FABP1</i>	FABP1	Hs00155026_m1*	A_23_P79562
<i>FABP2</i>	FABP2	Hs01573164_g1*	A_23_P391711
<i>FABP3</i>	FABP3	Hs00269758_m1*	A_24_P62783
<i>FABP4</i>	FABP4	Hs01086177_m1*	A_23_P8820
<i>FABP5</i>	FABP5	Hs02339439_g1	A_24_P673063
<i>FABP6</i>	FABP6	Hs01031183_m1*	A_23_P43846
<i>FABP7</i>	FABP7	Hs00361426_m1*	A_23_P134139
<i>FATP1</i>	SLC27A1	Hs01587917_m1*	A_24_P382489
<i>FATP2</i>	SLC27A2	Hs00186324_m1*	A_23_P140450
<i>FATP3</i>	SLC27A3	Hs00225680_m1*	A_24_P179816
<i>FATP4</i>	SLC27A4	Hs00192700_m1	A_24_P257971
<i>FATP5</i>	SLC27A5	Hs00202073_m1*	A_23_P4611
<i>FATP6</i>	SLC27A6	Hs00204034_m1*	A_23_P41789

<i>CAV1</i>	CAV1	Hs00971716_m1*	A_23_P134454
<i>CD36</i>	CD36	Hs00169627_m1*	A_24_P925505
<i>LRP1</i>	LRP1	Hs00233856_m1*	A_23_P124837
<i>LRP2</i>	LRP2	Hs00189742_m1*	A_23_P28295
<i>LRP8</i>	LRP8	Hs00182998_m1*	A_23_P200222

**Supplementary Table 2 Relative gene expression in human liver tissue slices  
the Fluidigm® 96.96 Dynamic Array™**

	Liver 1 Fold changes <i>vs</i> control					Liver 2 fold changs <i>vs</i> control				
	Control		Methylamine			Control		Methylamine		
<u>Gene</u>	Mean	SD	Mean	SD	Cont vs meth paired t test p value	Mean	SD	Mean	SD	Cont vs meth paired t test p value
FABP1	1	0.2031	0.5556	0.1017	0.0097	1	0.0746	1.7612	0.2492	0.004
FABP2						1	0.2097	2.4118	0.5599	0.0052
FABP3	1	0.2687	0.8429	0.1868	0.4684	1	0.1314	0.8951	0.1673	0.5491
FABP4	1	0.2605	1.2006	0.254	0.3773	1	0.1207	1.1739	0.2289	0.4434
FABP5	1	0.2161	1.1029	0.2073	0.6026	1	0.1028	0.508	0.0834	0.0001
FABP6	1	0.8385	0.6632	0.4834	0.6129	1	0.4346	0.5683	0.2853	0.2697
FABP7										
FATP1	1	0.2252	0.8384	0.152	0.3658	1	0.146	1.1895	0.248	0.4361
FATP2	1	0.1697	0.5807	0.0917	0.0049	1	0.0429	1.5169	0.1405	0.001
FATP3	1	0.2074	0.9725	0.1715	0.8765	1	0.0952	1.3693	0.1905	0.052
FATP4	1	0.2316	0.5513	0.1135	0.0192	1	0.1334	1.8821	0.3655	0.0147
FATP5	1	0.2152	0.4736	0.0858	0.0032	1	0.1147	1.9242	0.3431	0.0079
FATP6	1	0.3983	1.1961	0.474	0.6576	1	0.3301	1.0411	0.352	0.9064

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CAV1	1	0.1704	1.1147	0.1749	0.493	1	0.1281	1.2536	0.2275	0.255
CD36	1	0.2113	0.9962	0.1828	0.9835	1	0.0934	1.0142	0.1524	0.9263
LDLR	1	0.3081	0.6799	0.1696	0.1834	1	0.2384	1.0925	0.3131	0.764
LDLRAP1	1	0.272	0.6141	0.1522	0.0864	1	0.1434	1.7102	0.3655	0.0469
LRP1	1	0.2452	0.6038	0.1281	0.0472	1	0.143	1.7361	0.39	0.0546
LRP2	1	0.2916	0.8163	0.1964	0.4323	1	0.089	1.3488	0.2382	0.1457
LRP8	1	0.4646	0.8357	0.3	0.6434	1	0.1581	1.2804	0.3458	0.4103
RXRA	1	0.1688	0.6278	0.0992	0.012	1	0.0694	1.43	0.2078	0.0443
VLDLR	1	0.3077	0.8725	0.2248	0.6132	1	0.1795	1.8121	0.4259	0.0441
IL1R2	1	0.1655	1.0159	0.1509	0.9164	1	0.0701	1.3552	0.1875	0.0637
IL6	1	0.3466	1.1524	0.4022	0.6899	1	0.3777	0.9972	0.3544	0.9937
IL8	1	0.2891	1.2677	0.3001	0.3039	1	0.1885	0.5726	0.1352	0.0223
INSR1	1	0.2059	0.7647	0.1396	0.1758	1	0.1552	1.3832	0.2775	0.15
IRS1	1	0.192	0.6024	0.1126	0.0185	1	0.115	1.8597	0.3213	0.008
IRS2	1	0.1984	0.615	0.1169	0.0257	1	0.1189	1.4224	0.2694	0.1127
CCL3	1	0.2743	1.4073	0.3164	0.1195	1	0.1352	0.7217	0.1327	0.074
CCR7	1	0.3544	1.2591	0.3612	0.4066	1	0.1344	1.1039	0.2375	0.6603
CXCL6	1	1.4103	2.1412	2.3018	0.3954	1	0.3011	1.2694	0.4821	0.5576
FLT1	1	0.2161	1.3898	0.2752	0.1076	1	0.0842	0.8422	0.1238	0.2303
KDR	1	0.1579	1.149	0.1702	0.3559	1	0.1048	0.9533	0.1582	0.7729
VEGF	1	0.2524	0.8681	0.1845	0.5259	1	0.1559	1.2168	0.2227	0.3113
VEGFA	1	0.2074	0.8208	0.1444	0.2947	1	0.1589	1.3109	0.2477	0.1877
VEGFB	1	0.2423	0.8583	0.1728	0.4725	1	0.116	1.3857	0.2669	0.1448
VEGFC	1	0.2465	1.1129	0.2388	0.6179	1	0.1365	1.4369	0.2792	0.1081
NR1H3										
(LXRa)	1	0.2329	0.6543	0.1245	0.0624	1	0.1611	1.4978	0.3222	0.1068
NR1H4										
(FXR)	1	0.18	0.6248	0.1047	0.0163	1	0.0888	1.6787	0.2597	0.0113
NRIH2	1	0.1983	0.6909	0.1177	0.0592	1	0.1002	1.3166	0.2275	0.1628

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(LXRb)

PPARA	1	0.2662	0.5344	0.123	0.0303	1	0.0935	1.6098	0.2773	0.0309
PPARG	1	0.2155	0.6537	0.1231	0.0521	1	0.1142	1.651	0.3084	0.0349
PPARGC1	1	0.3082	0.4364	0.1067	0.0193	1	0.192	2.3195	0.6071	0.0223
PPARGC1A1		0.2334	0.5006	0.0992	0.0089	1	0.1435	1.4852	0.2928	0.0869

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Fold change in gene expression in 12 replicate precision cut liver slices prepared from 2 independent human donor liver samples run on triplicate array plates. Slices were treated with 200µm methylamine for approximately 4.5 hours. RNA was extracted and mRNA expression was carried out using a fluidigm qPCR array® Results are expressed as the mean fold change in gene expression normalized to pooled endogenous controls β-actin and GAPDH relative to untreated control livers. Statistical analyses for effects of methylamine on each individual liver donor are shown and  $P < 0.05$  was considered as significantly different.

**Supplementary Table 3 Raw data for relative gene expression in whole human liver tissue using the Fluidigm® 96.96 Dynamic Array™**

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	Normal			
	Liver	Steatotic	NASH	ALD
FABP1	1.	0.441610	1.487151	0.940001
FABP2	1.	0.914261	1.782723	3.979964
FABP3	1.	0.169258	0.639979	0.871757
FABP4	1.	0.204538	19.535170	61.184570
FABP5	1.	0.319909	2.510300	5.027960
FABP6	1.	2.757204	-0.057820	7.989950
FATP1	1.	0.562131	2.430105	2.593811
FATP2	1.	0.330801	1.289112	0.880067
FATP3	1.	0.544056	2.526373	2.858065
FATP4	1.	1.029857	2.181678	2.184511
FATP5	1.	0.219116	1.193708	0.910912

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FATP6	1.	-0.236410	3.035104	1.787133
CAV1	1.	0.471837	2.525350	5.262565
CD36	1.	0.202299	0.844420	1.331905
LDLR	1.	1.212294	1.147517	0.956534
LDLRAP1	1.	0.958212	2.277251	2.137096
LRP1	1.	1.383786	1.777239	1.777211
LRP2	1.	2.478231	3.936287	3.062879
LRP8	1.	1.587565	3.337129	7.556064
RXRA	1.	1.815197	1.634806	1.770862
VLDLR	1.	1.531175	12.045880	26.699770
IL1R2	1.	1.142678	0.996800	1.099045
IL6	1.	2.446954	1.070199	1.320667
IL8	1.	0.109125	3.077405	1.988588
INSR1	1.	1.367268	2.339568	2.606168
IRS1	1.	0.494529	1.973854	1.332179
IRS2	1.	0.890765	2.793188	0.951927
FLT1	1.	0.923981	3.054243	4.568171
KDR	1.	0.420372	1.206955	1.590497
VEGF	1.	1.391382	2.135922	3.013589
VEGFA	1.	2.279640	7.796069	9.572046
VEGFB	1.	1.267152	1.773432	2.781710
VEGFC	1.	0.472247	5.465250	10.210450
NR1H3 (LXRa)	1.	0.952532	1.000611	0.952532
NR1H4 (FXR)	1.	1.165282	1.361679	1.165282
NRIH2 (LXRb)	1.	1.110863	1.092930	1.110863
PPARA	1.	2.192061	2.349336	2.192061
PPARG	1.	6.850367	7.941745	6.850367
PPARGC1	1.	2.480103	4.889298	2.480103
PPARGC1A	1.	2.755149	4.643996	2.755149

Raw data for analysis of gene expression by quantitative qPCR analysis. mRNA

expression of indicated genes in whole liver RNA from normal, steatotic, NASH, and ALD livers using fluidigm qPCR array®, run on triplicate arrays. Results are expressed as the mean fold change in gene expression normalized to pooled endogenous controls  $\beta$ -actin and GAPDH relative to normal livers defined as 1 . Data are averaged from five normal l, four steatotic, three NASH, and four ALD livers. Data are expressed as a heatmap in Supplementary Figure 2.