

Supplementary Figure Legend

Figure S1. Microarray analysis of differential expression of miRNAs in livers of SHP^{-/-} mice as compared to wild-type mice. Total RNA containing miRNAs was isolated using RNeasy Mini Kit (Qiagen, Valencia CA) from livers of 2 month old male mice and were subjected to microarray analysis. The microarray analysis was conducted in LC Sciences, Houston, TX. Please refer to materials and methods section for detailed description.

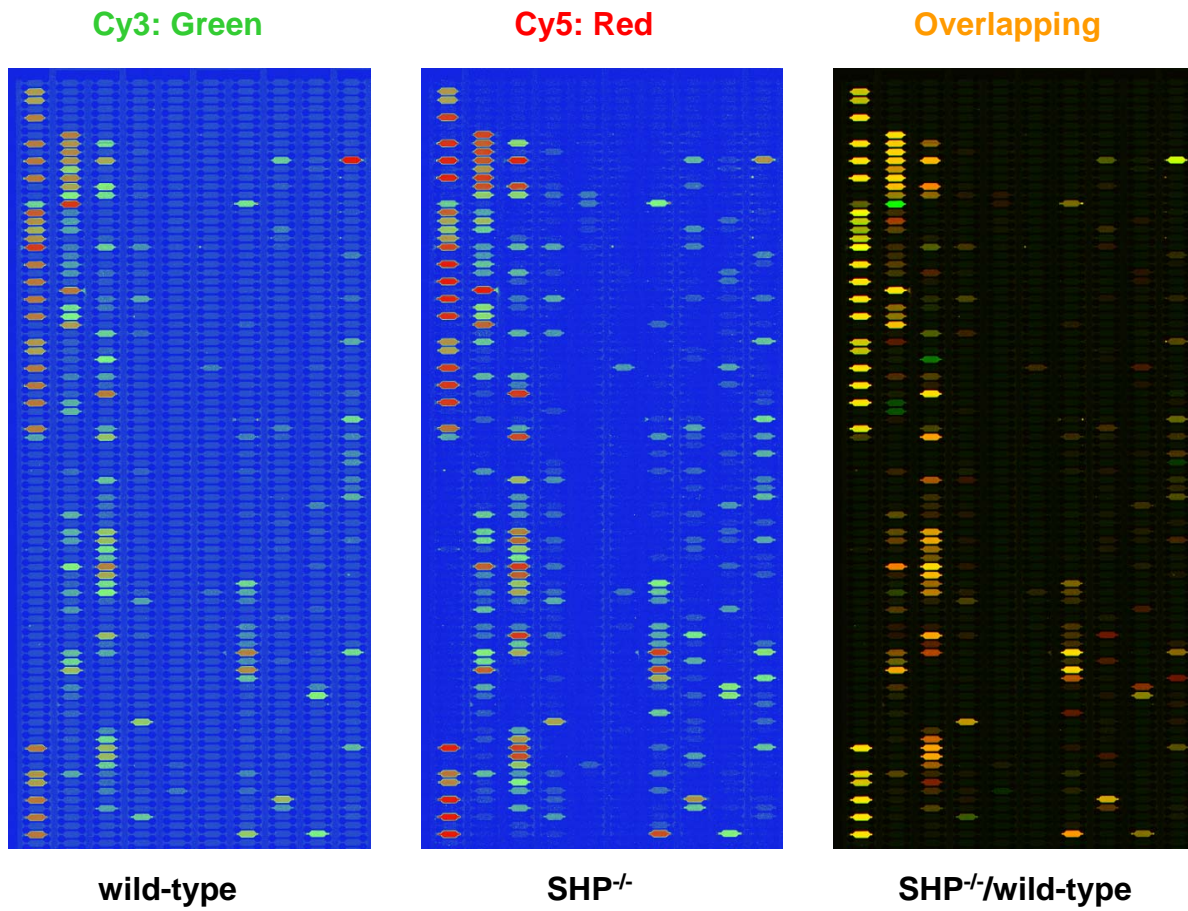
Supp. Table S1 Differentially expressed miRNAs in SHP^{-/-} mice (sample B signal) as compared to the wild type mice (Sample A signal). The fold induction (sample B/sample A) is presented as Log2.

Figure S2. Gene expression analysis. A, Semi-quantitative RT-PCR analysis of ERR α and ERR β mRNA in Nmuli and Hepa-1 cells. ERR β expression was detected using higher PCR cycles. **B,** Transient transfection assays to determine ERR β regulation of miR-433 and miR-127 promoter (pro.) transactivation. Hela cells were transfected with the -1392miR-433Luc or -1513miR-127Luc in the presence of ERR β expression plasmid (50, 100, 200 ng). Luciferase (luc.) activities (act.) were normalized by β -gal activities. **C,** Semi-quantitative RT-PCR analysis of ERR γ mRNA in Hepa-1 cells transfected with control (con) or siRNA-ERR γ . Total RNA was isolated and used for RT-PCR analysis.

Figure S3. Transient transfection assays to determine LRH-1 regulation of miR-433 and miR-127 promoter (pro.) transactivation. Hela cells were transfected with the -1392miR-433Luc or -1513miR-127Luc in the presence of LRH-1 expression plasmid (50, 100, 200 ng). Luciferase (luc.) activities (act.) were normalized by β -gal activities.

Table S2. Primer sequences used for deletion construct, CHIP assays and gel shift assays.

Microarray analysis of differential expression of miRNAs in livers of SHP^{-/-} mice



The images are displayed in pseudo colors so as to expand visual dynamic range.

Table 1 Call list (differentially expressed transcripts with p-value < 0.01)

No.	Probe_ID	Sample A Signal	Sample B Signal	log ₂ (Sample B / Sample A)
1	miR-1	67,147.65	51.89	-10.31
2	miR-206	10,156.98	18.37	-9.07
3	miR-1	381.65	1.00	-8.58
4	miR-133b	4,132.36	12.74	-8.38
5	miR-133a	3,344.82	14.07	-7.87
6	miR-337	1.61	153.61	6.76
7	miR-376b	48.12	4,317.04	6.65
8	miR-434-5p	7.55	259.51	5.67
9	miR-431	2.86	109.71	5.66
10	miR-376b	77.58	3,804.39	5.63
11	miR-376b*	6.46	133.41	5.24
12	miR-485-5p	5.62	97.55	4.93
13	miR-543	13.69	362.90	4.65
14	miR-300	7.51	141.61	4.55
15	miR-383	6.79	123.13	4.22
16	miR-134	30.23	385.19	3.80
17	miR-205	272.63	19.22	-3.77
18	miR-434-3p	88.64	1,253.16	3.77
19	miR-379	77.48	1,008.08	3.76
20	miR-154*	37.20	473.55	3.67
21	miR-381	12.95	153.18	3.56
22	miR-127	253.82	2,765.78	3.45
23	miR-494	57.05	586.07	3.44
24	miR-30e-5p	497.24	5,433.71	3.39
25	miR-495	54.17	560.75	3.35
26	miR-127	300.55	2,789.20	3.28
27	miR-154	66.19	604.23	3.19
28	miR-409	34.77	283.32	3.12
29	miR-411	62.83	529.29	3.12
30	miR-541	193.04	1,669.47	3.11
31	miR-409-3p	48.91	364.28	2.90
32	miR-494	78.73	599.65	2.89
33	miR-801	372.06	61.84	-2.71

Table 1 Call list (differentially expressed transcripts with p-value < 0.01)

34	miR-495	96.22	594.61	2.65
35	miR-485-3p	57.11	333.70	2.61
36	miR-379	278.81	1,631.27	2.59
37	miR-292-5p	43.69	245.79	2.58
38	miR-433	22.24	125.13	2.49
39	miR-424	16.41	89.59	2.49
40	miR-346	130.89	22.13	-2.45
41	miR-134	55.72	320.60	2.45
42	miR-299-5p	119.58	675.59	2.44
43	miR-455	41.11	205.04	2.39
44	miR-149	341.20	67.84	-2.36
45	miR-224	200.93	40.93	-2.36
46	miR-486	6,125.81	1,173.02	-2.33
47	miR-224	208.50	43.04	-2.33
48	miR-680	240.22	1,188.95	2.29
49	miR-409-3p	70.17	342.20	2.29
50	miR-10b	141.55	29.91	-2.27
51	miR-382	97.46	426.19	2.22
52	miR-689	1,255.56	5,867.83	2.20
53	miR-290	166.17	724.78	2.18
54	miR-329	74.67	323.18	2.17
55	miR-29b	605.41	2,682.28	2.15
56	miR-327	54.46	240.36	2.15
57	miR-485-3p	92.77	406.16	2.14
58	miR-802	40.12	175.00	2.12
59	miR-101	2,324.57	10,157.48	2.12
60	miR-667	42.67	176.36	2.10
61	miR-150	3,136.49	723.57	-2.07
62	miR-709	70,678.16	17,201.15	-2.07
63	miR-768-5p	133.18	30.20	-2.06
64	miR-382	98.50	398.37	2.05
65	miR-712*	103.92	25.02	-2.05

Table 1 Call list (differentially expressed transcripts with p-value < 0.01)

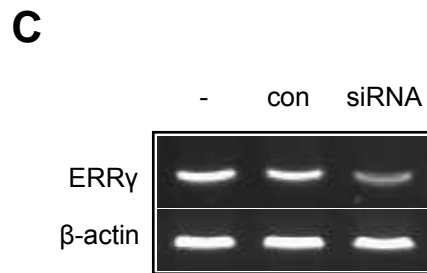
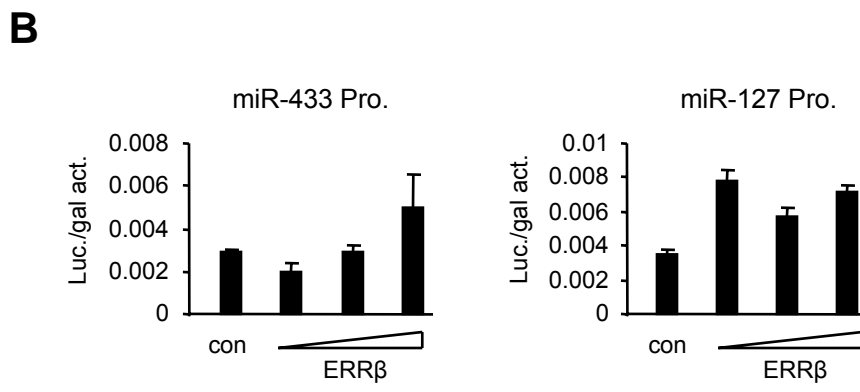
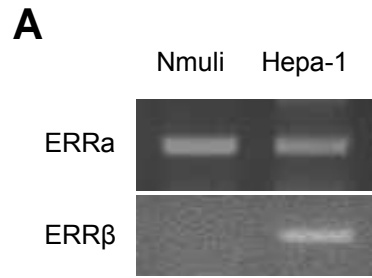
66	miR-200c	872.94	224.21	-1.95
67	miR-721	44.31	180.42	1.93
68	miR-29c	3,150.87	11,683.73	1.92
69	miR-106a	89.12	339.00	1.88
70	miR-128b	249.85	78.28	-1.67
71	miR-203	5,684.93	1,799.11	-1.62
72	miR-19b	739.85	2,230.08	1.59
73	miR-128a	235.49	75.34	-1.58
74	miR-203	6,314.29	2,146.83	-1.54
75	miR-350	92.27	273.99	1.52
76	miR-199a*	6,390.63	2,374.22	-1.47
77	miR-20b	70.91	206.39	1.42
78	miR-148b	271.30	714.08	1.40
79	miR-350	149.49	404.54	1.37
80	miR-101b	4,638.18	11,096.06	1.28
81	miR-378	332.39	136.20	-1.27
82	miR-194	12,287.75	28,089.56	1.20
83	miR-140*	1,146.25	517.20	-1.20
84	miR-22*	602.92	1,441.48	1.16
85	miR-140*	1,175.16	556.80	-1.13
86	miR-20b	171.66	375.96	1.13
87	miR-30a-5p	6,966.59	15,160.28	1.11
88	miR-181b	425.17	198.57	-1.11
89	miR-214	3,113.72	1,532.29	-1.08
90	miR-148a	11,582.28	24,235.55	1.06
91	miR-365	525.34	1,105.08	1.06
92	miR-22	5,236.78	10,947.64	1.03
93	miR-200b	1,017.34	505.19	-1.01
94	miR-15b	6,873.48	3,423.22	-0.98
95	miR-805	7,192.68	3,706.68	-0.96
96	miR-151*	3,893.46	2,137.01	-0.91
97	miR-20b	305.41	605.81	0.88

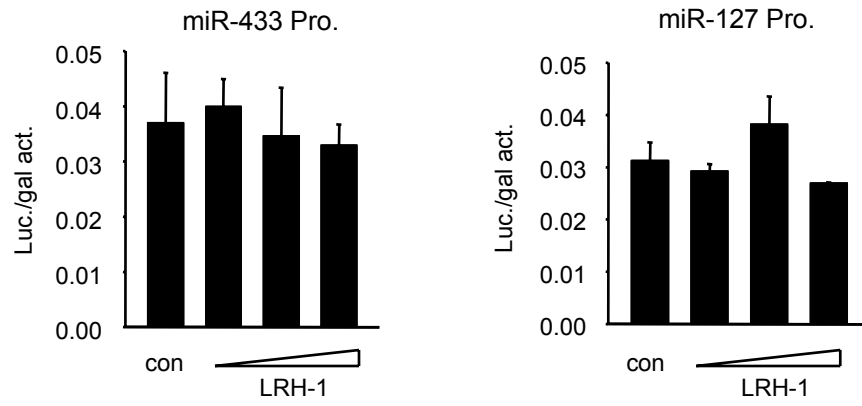
Table 1 Call list (differentially expressed transcripts with p-value < 0.01)

98	miR-130a	1,105.17	2,049.36	0.88
99	miR-132	296.31	162.59	-0.87
100	miR-181a	629.01	342.90	-0.86
101	miR-361	3,184.04	1,729.75	-0.80
102	miR-192	15,713.78	26,640.37	0.78
103	miR-690	11,639.25	6,781.73	-0.76
104	miR-215	18,010.01	29,983.84	0.75
105	miR-29a	18,258.01	30,052.68	0.74
106	miR-192	22,772.33	37,675.50	0.72
107	miR-422b	4,555.13	2,722.30	-0.71
108	miR-455-3p	1,666.36	2,589.62	0.68
109	miR-320	2,951.04	1,819.33	-0.66
110	miR-638	8,126.84	5,107.22	-0.66
111	miR-30d	5,880.75	9,312.64	0.66
112	miR-422b	2,795.98	1,790.44	-0.64
113	miR-139	588.72	917.19	0.64
114	miR-30b	19,003.24	29,439.75	0.63
115	miR-185	3,217.91	2,237.19	-0.59
116	miR-705	8,865.73	5,930.87	-0.55
117	miR-30c	19,039.96	27,920.45	0.54
118	miR-143	4,101.38	2,803.29	-0.54
119	miR-10a	2,129.88	1,425.42	-0.53
120	miR-20a	2,879.69	2,023.63	-0.50
121	miR-762	3,941.27	2,941.01	-0.44
122	let-7i	11,725.04	8,736.17	-0.43
123	miR-145	3,923.86	2,948.94	-0.41
124	miR-146a	2,667.98	3,517.83	0.39
125	miR-92	6,723.34	5,211.18	-0.38
126	miR-15a	4,498.92	5,715.29	0.34
127	miR-125b	10,261.10	8,025.18	-0.33
128	let-7f	29,555.56	25,302.09	-0.30
129	miR-27b	10,827.38	13,371.28	0.29
130	miR-27a	7,770.33	9,500.11	0.28

Table 1 Call list (differentially expressed transcripts with p-value < 0.01)

131	miR-23b	18,670.74	22,351.51	0.27
132	miR-25	5,179.74	4,310.32	-0.27
133	miR-16	18,476.54	22,110.85	0.26
134	miR-451	19,072.96	16,157.59	-0.26
135	let-7a	32,847.16	27,220.94	-0.26
136	let-7a	34,817.95	29,595.25	-0.24
137	let-7b	29,478.58	25,041.91	-0.21
138	let-7c	32,340.91	28,544.86	-0.18
139	let-7d	29,531.11	25,140.39	-0.18
140	miR-126	26,959.59	23,789.78	-0.18
141	miR-23a	17,555.25	19,556.66	0.17
142	let-7g	25,192.88	28,360.12	0.15
143	let-7f	32,147.00	29,492.12	-0.13





(LRH-1 dose: 50, 100, 200ng)

Primer sequences used for deletion constructs, ChIP assays, and gel shift assays

miR-433Luc deletion constructs

-1088Luc	5'-GACAGTTAGGACAGTTAGGGTTACACAG
-622Luc	5'- CAGGAAAAGCTCAGCCAGCTCT
-328Luc	5'- CACTTCCAAATTAGGGCAGG
-92Luc	5'- GACTCTTCCAGTAGAGCAGGCCACGGA
Reverse	5'- GAGCTACTGGCTGCCATCCCGATG

miR-127Luc deletion constructs

-990Luc	5'-GCCCTAATGGACATAAGCAGCAGT
-713Luc	5'-GAAGGATCCTCATCTCCACTCGA
-508Luc	5'-CTTCAGGGATTCCAAGGCCTCC
-287Luc	5'-GGGATATGTTGAAGCCCAAGAT
Reverse	5'-CAGAGAGGTCCTGGTCTACTCAATG

ChIP assays

E2-F	5'-GAAAGCATGGAACACAGCACCTTG
E2-R	5'-TGAGACCAATGAGGAGAGAGCAGTG
E1'-F	5'-CTTCAGGGATTCCAAGGCCTCCTGC
E1'-R	5'-CAGAGAGGTCCTGGTCTACTCAATG

ERRa Distance Forward	5'- CCACAGAGTGGGCAGACAGTAAG
ERRa Distance Reverse	5'- CAGACCCTGGCACAACCTAACCAC
ERRa ChIP Forward	5'- AGAGTCTATGCATGGTCCCAGAGTC
ERRa ChIP Reverse	5'- TGGTAGATCAGCACCCCTGAGGAC

miR-127 Promoter distance primer forward	5'-GACACTCAGTGTGCCTTCTC
miR-127 Promoter distance primer reverse	5'-GTAAGAGAACATTCCACAGACC

Primer sequences used for deletion constructs, ChIP assays, and gel shift assays

miR-433 gel shift

E2-F	5'- GTGTAGAGGTAGAAGTCCGTGGAGCACCCAAGGTCAGT GTCCCAGGATGCACAGGTGGCC
E2-R	5'- GGCCACCTGTGCATCCTGGGACACTGACCTTGGGTGCT CCACGGACTTCTACCTCTACAC
E2-F mut	5'- GTGTAGAGGTAGAAGTCCGTGGAGCACCCGTGTCC CAGGATGCACAGGTGGCC
E2-R mut	5'- GGCCACCTGTGCATCCTGGGACACGGGTGCTCCAC GGACTTCTACCTCTACAC
E1-F	5'- TCTGGGTCCAAAAGATTTCTGGTCTGAAGGTGACCGCTTCTGGTC GCCAAACAGGTCC
E1-R	5'- GGACCTGTTTGGCGACCAGGAAGCGGTACCTTCA GACCACGAAATCTTTGGACCCAGA
E1-F mut	5'- TCTGGGTCCAAAAGATTTCTGGTCTGTGACCGCTTCTGGTC GCCAAACAGGTCC
E1-F mut	5'- GGACCTGTTTGGCGACCAGGAAGCGGTACAGAC CACGAAATCTTTGGACCCAGA

miR-127 gel shift

E2'-F	5'-ACGAAGTGGCGATAGGGATAGACAAGGTCAATCACACTTTG AAGACACCTCCTGCTGCCA
E2'-R	5'-TGGCAGCAGGAGGTGTCTTCAAAGTGTGATTGACCTTGTCTA TCCCTATCGCCACTTCGT
E2'-F mut	5'-ACGAAGTGGCGATAGGGATAGAATCACACTTTGAAGACAC CTCCTGCTGCCAGGGACAGG
E2'-R mut	5'-CCTGTCCCTGGCAGCAGGAGGTGTCTTCAAAGTGTGATTCT ATCCCTATCGCCACTTCGT
E1'-F	5'-CGACTTGCGGAAAGCCCTCTTCAGGGATTCCAAGGCCTCCTGC TCTCTTCTCCCCAGTA
E1'-R	5'-TACTGGGGAGAAGAGGAGCAGGAGGCCTTGAATCCCT GAAGAGGGCTTTCCGCAAGTCG
E1'-F mut	5'-CGACTTGCGGAAAGCCCTCTTCAGGCCTCCTGCTCCTCTT CTCCCCAGTA
E1'-F mut	5'- TACTGGGGAGAAGAGGAGCAGGAGGCCTGAAGAGGG CTTTCCGCAAGTCG