Supplemental Information

Material and Methods

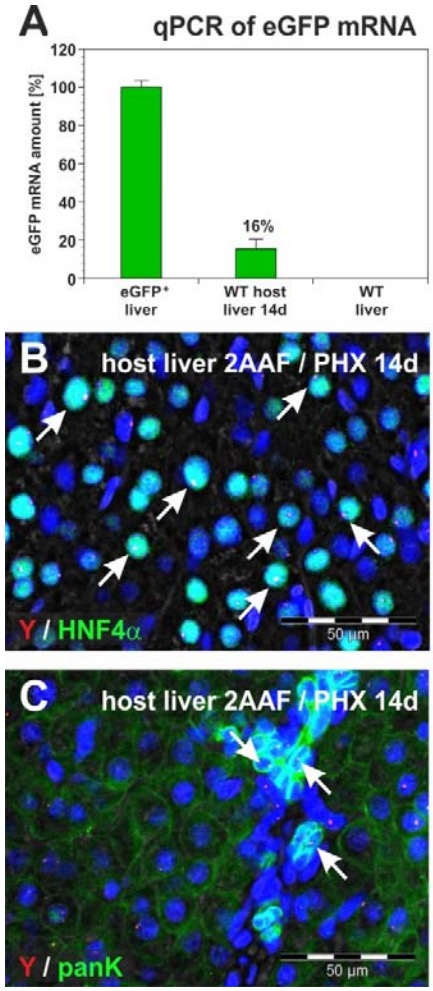
Cell isolation and culture

HSC were isolated from adult male Wistar rats (>500 g), which were obtained from the animal facility of the Heinrich Heine University (Düsseldorf, Germany). Stellate cells were enriched by density gradient centrifugation (8% Nycodenz, #1002424, Nycomed Pharma, Oslo, Norway) after enzymatic digestion of the liver essentially as described (43). HSC were cultured in Dulbecco's Modified Eagle Medium (DMEM, #41966-029, Gibco, Invitrogen, Karlsruhe, Germany) supplemented with 10% fetal calf serum (FCS) and 1% antibiotic/antimycotic solution (#15240-062, Gibco). Isolated HSC were also maintained as single cell clones for several months as described for pancreatic stellate cells (24). Stem cells from the umbilical cord blood of unborn Wistar rats (18-20 days *post coitum*) were collected by flushing out the umbilical cord with culture medium. The cord blood cells were then maintained as single cell clones for several months and analyzed for stem/progenitor cell marker expression (38). The umbilical cord blood stem cells (UCBSC) were cultured in Dulbecco's Modified Eagle Medium Nutrient Mixture F-12 (DMEM/F12, #11330-032, Gibco) supplemented with 15% FCS (#06902, Stem Cell Technologies) and 1% antibiotic/antimycotic solution (Gibco). MSC from the bone marrow of adult rats were obtained by flushing out the humeri with 0.5 mM ethylenediaminetetraacetic acid (#8043.3, Carl Roth, Karlsruhe, Germany) dissolved in phosphate buffered saline containing 2% FCS. Bone marrow cells were filtered, washed by centrifugation and blood cell lineages were depleted by using antibodies against CD3 (#MCA772F), CD45RA (#MCA340FT), CD161 (#MCA1427F, AbD Serotec, Oxford, UK) and CD11b (#SM1764F, Acris, Herford, Germany) coupled to fluorescein isothiocyanate (FITC) and the FITC EasySep selection Kit (#18558, Stem Cell Technologies, Vancouver, Canada). Bone marrow cells that remained unselected by this method were seeded on plastic dishes coated with collagen type 1 (#356401, BD Biosciences,

Heidelberg, Germany), cultured in MSC expansion medium (#CCM004; StemXVivo Mesenchymal Stem Cell Expansion Medium; R&D Systems) and finally characterized as MSC. Muscle fibroblasts were obtained by outgrowing from rat abdominal muscle and cultured in DMEM supplemented with 10% FCS and 1% antibiotic/antimycotic solution (Gibco) for at least 14 days before usage.

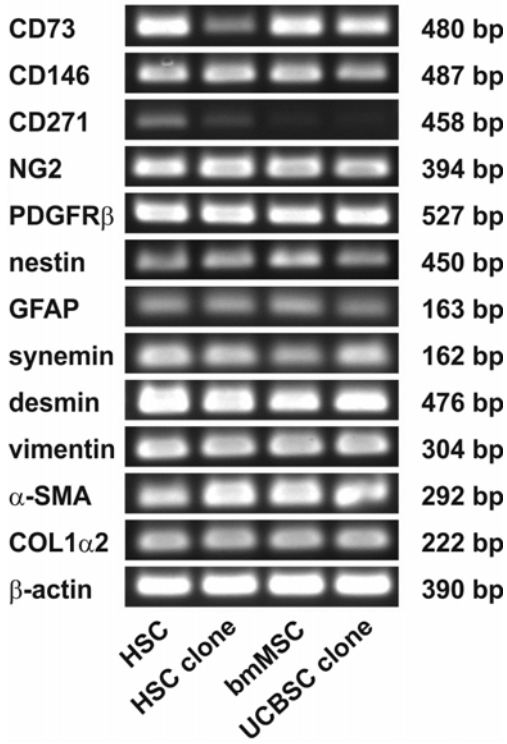
Fluorescence-activated cell sorting (FACS)

Freshly isolated HSC from eGFP^{+} male Wistar rats (>500 g), which express eGFP under the control of a chicken β-actin promoter (Wistar-TgN(CAG-GFP)184Ys, Rat Resource & Research Center, University of Missouri, Columbia, MO, USA), were first enriched by density gradient centrifugation (43), collected in Iscove's Modified Dulbecco's Medium (IMDM) without phenol red (#21056023, Gibco, Invitrogen, Karlsruhe, Germany) supplemented with 2% rat serum (self-made) and immediately sorted by the flow cytometer MoFlo XDP (Beckman Coulter, Krefeld, Germany). Stellate cell suspensions were analyzed by forward and side scatter to determine single cells with equal morphology and excited by an UV laser at 355 nm to measure retinoid fluorescence at 485 nm. Cells with characteristic retinoid fluorescence were then collected in new tubes containing buffer supplemented with 2% rat serum. HSC obtained by FACS were immediately transplanted without culture. A subset of the sorted HSC was given into culture dishes for characterization by immunofluorescence.



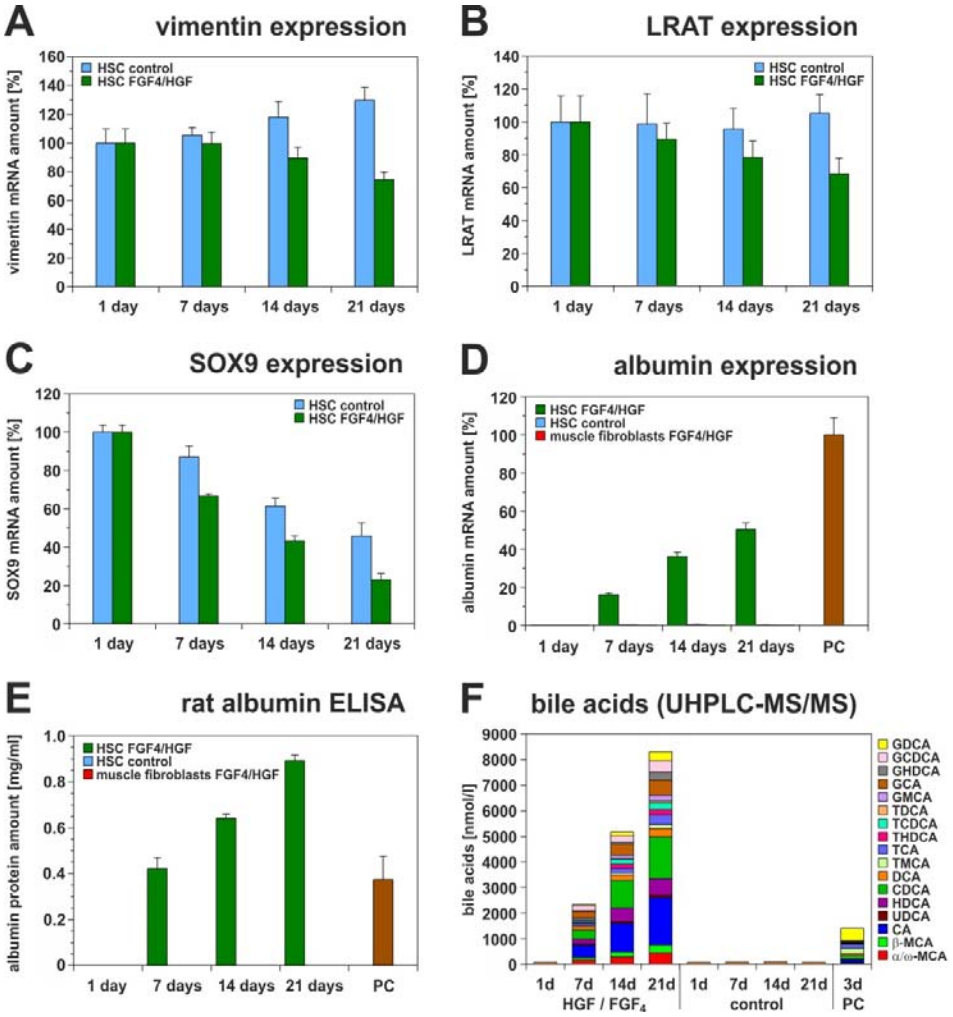
Supplemental Figure S1 Transplanted HSC clones contributed to liver regeneration by differentiation into hepatocytes and bile duct cells.

(**A**) Analysis of eGFP mRNA amounts by qPCR in liver samples of wild type (WT) rats that underwent PHX in the presence of 2AAF 14 days after transplantation of different HSC clones (n = 4). Liver samples of eGFP positive rats and wild type rats served as positive (100%) and negative (0%) controls (n = 3). FISH analysis of chromosome Y (red) and immuno-fluorescence of (**B**) HNF4α and (**C**) panCK (green) on liver sections of female host rats (2AAF/PHX model) that received HSC clones from male rats (14 days of liver regeneration). Cells with chromosome Y and HNF4α or panCK are indicated by an arrow (zone 1). The chromosome Y (red) appears white when HNF4α (green) and DAPI (blue) is co-stained.



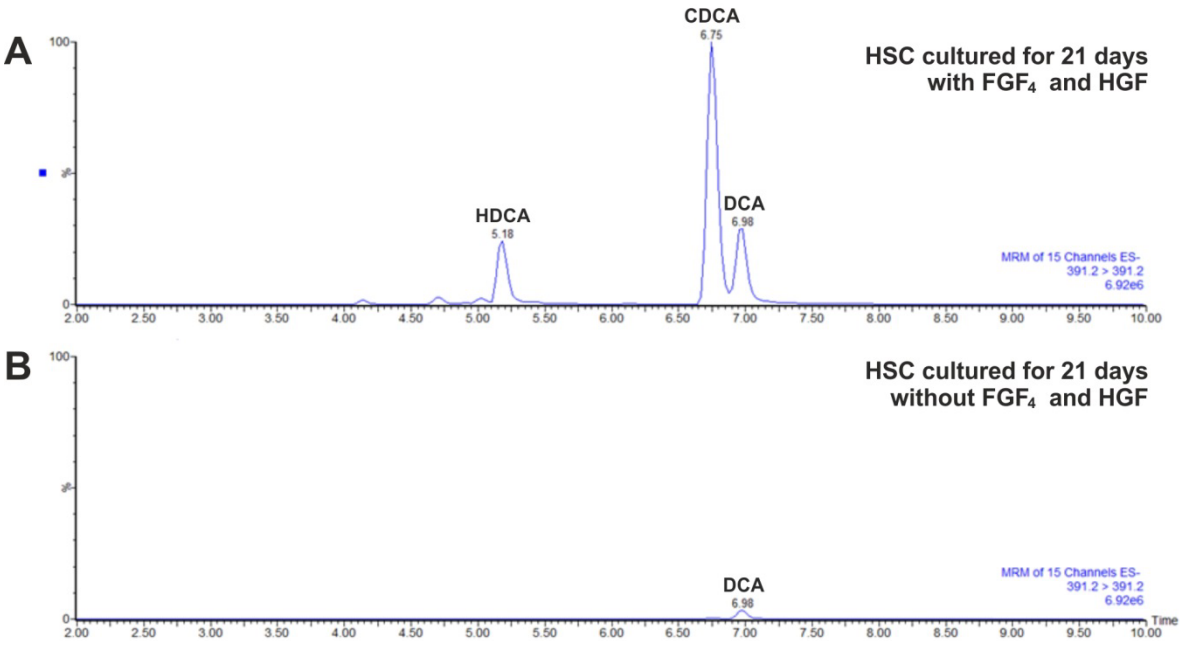
Supplemental Figure S2 Characterization of HSC, HSC clones, bmMSC and UCBSC.

The expression of MSC (CD73, CD146, CD271, neural-glial antigen 2/NG2, platelet-derived growth factor receptor β/PDGFRβ, nestin) and stellate cell markers (GFAP, synemin, desmin, vimentin, α-SMA, procollagen type 1 α2 chain/COL1α2) by HSC, HSC clone (1E7), bmMSC and UCBSC clone (1G11) was investigated by RT-PCR and demonstrated similar characteristics.



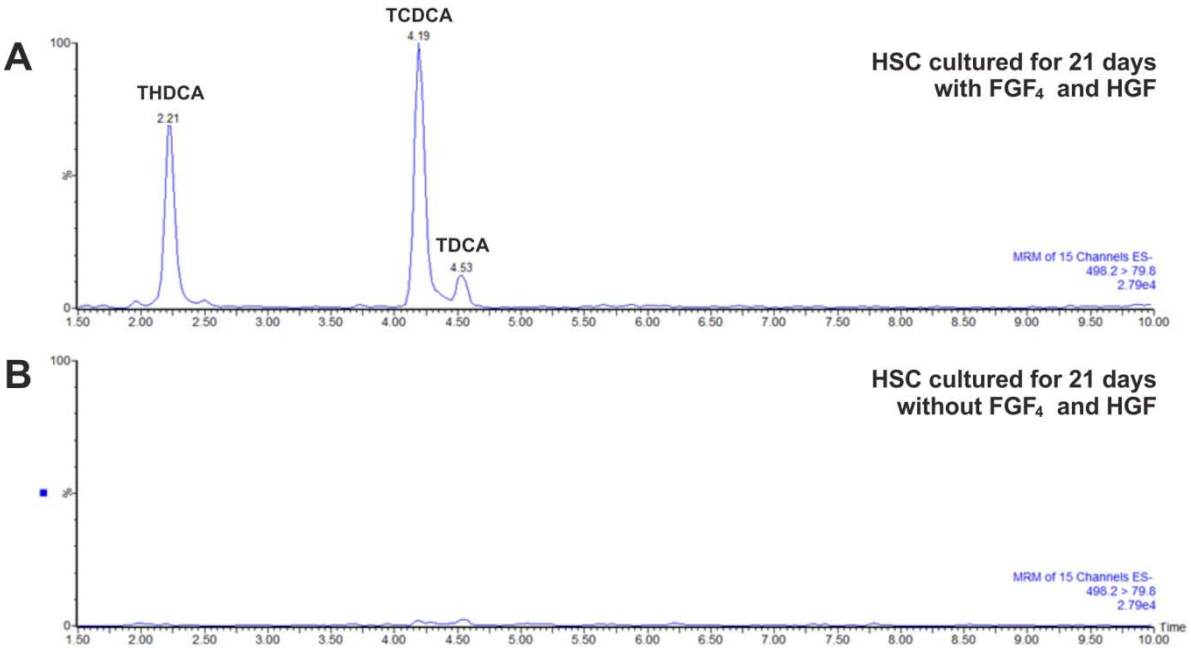
Supplemental Figure S3 Growth factor treated hepatic stellate cells (HSC) differentiate into hepatocyte-like cells in vitro.

The mRNA levels of (**A**) vimentin, (**B**) LRAT and (**C**) SOX9 were analyzed by qPCR in HSC treated with or without (control) the growth factors FGF4 and HGF during 21 days (n = 3). (**D, E**) HSC and muscle fibroblasts of rats were treated with FGF_4 and HGF for 21 days. HSC were also cultured for 21 days without growth factors (control). (**D**) The mRNA amout of albumin was determined by qPCR in weekly intervals (n = 3). The albumin mRNA level of rat hepatocytes (parenchymal cells/PC) cultured for 3 days served as a positive control. In the same experiments, (**E**) the albumin protein and (**F**) bile acid content of the culture medium was determined by ELISA or UHPLC-MS/MS, respectively (n = 3).



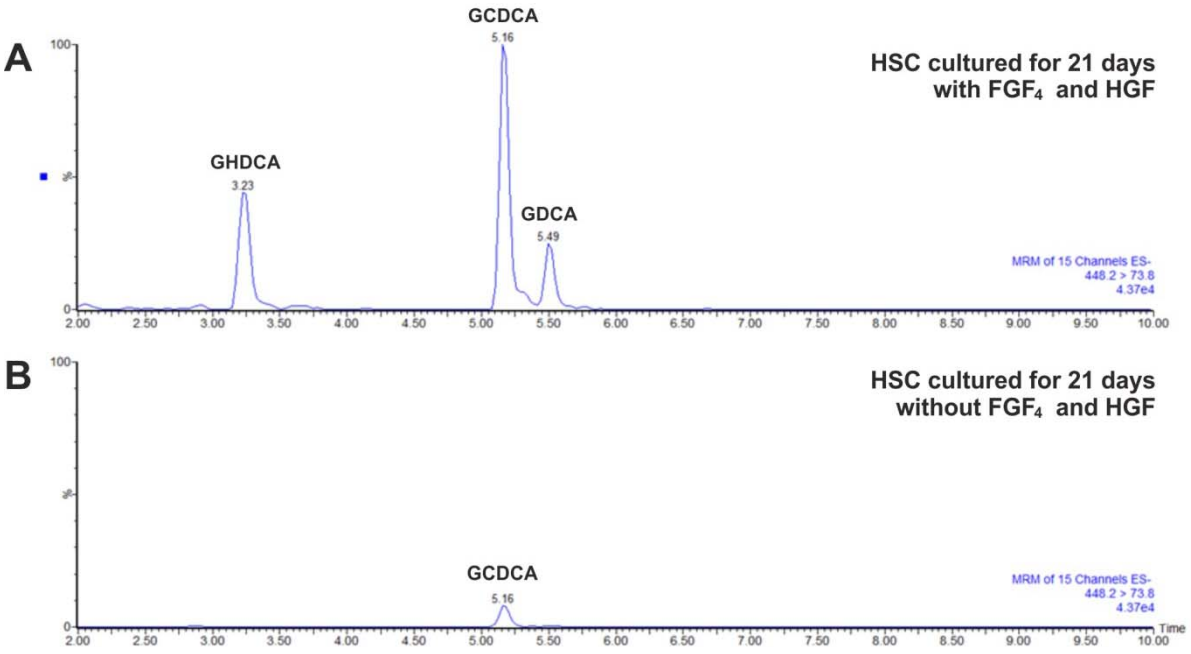
Supplemental Figure S4 Quantitation of bile acid synthesis in primary cultures of HSC by UHPLC-MS/MS.

The bile acids hyodeoxycholic acid (HDCA), chenodeoxycholic acid (CDCA) and deoxycholic acid (DCA) were analyzed by UHPLC-MS/MS in culture supernatants of HSC after 21 days in the (**A**) presence and (**B**) absence (control) of the growth factors HGF and FGF_4. Traces of DCA were also detectable in freshly prepared medium without cultured cells (not shown).



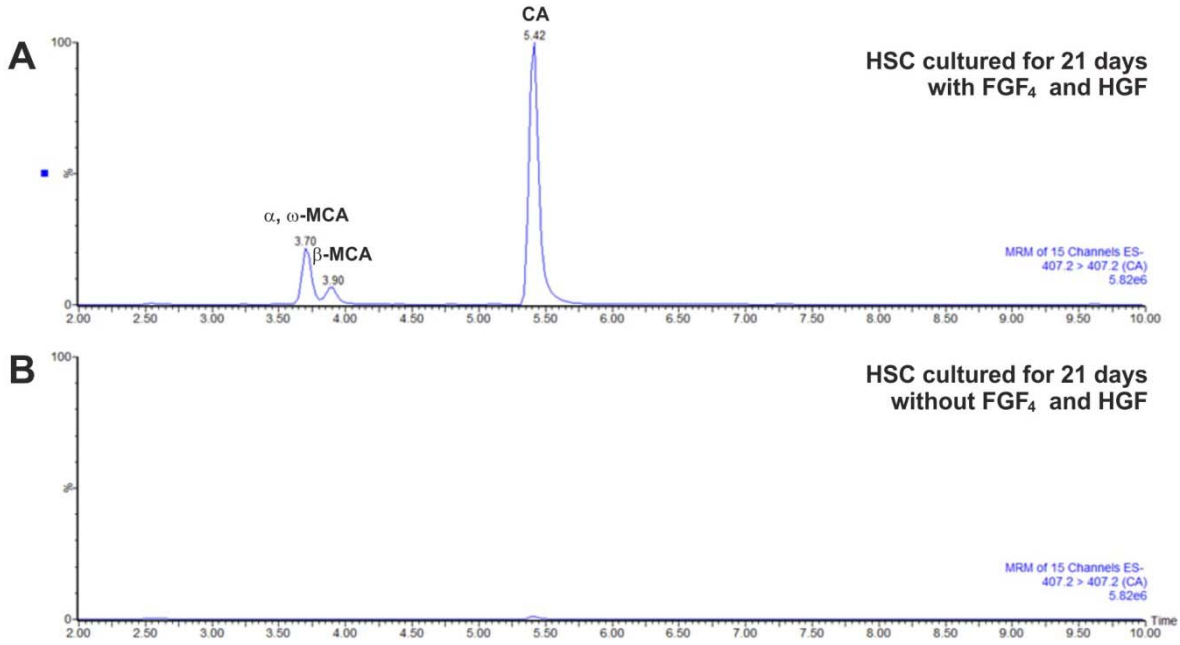
Supplemental Figure S5 Quantitation of bile acid synthesis in primary cultures of HSC by UHPLC-MS/MS.

The bile acids taurohyodeoxycholic acid (THDCA), taurochenodeoxycholic acid TCDCA and taurodeoxycholic acid (TDCA) were analyzed by UHPLC-MS/MS in culture supernatants of HSC after 21 days in the (**A**) presence and (**B**) absence (control) of the growth factors HGF and FGF_4.



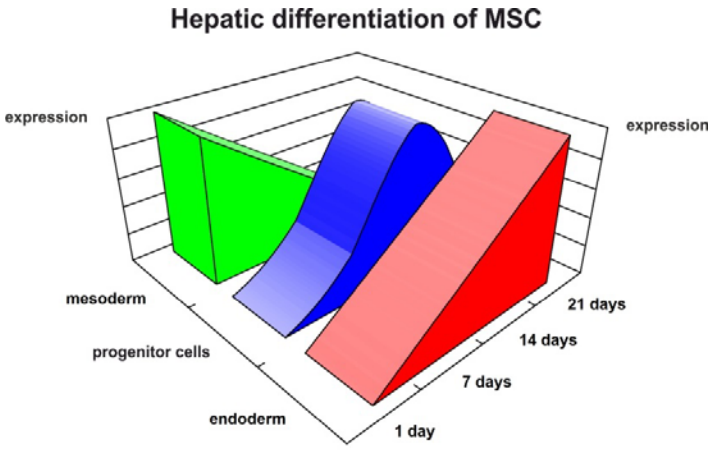
Supplemental Figure S6 Quantitation of bile acid synthesis in primary cultures of HSC by UHPLC-MS/MS.

The bile acids glycohyodeoxycholic acid (GHDCA), glycochenodeoxy cholic acid (GCDCA) and glycodeoxycholic acid (GDCA) were analyzed by UHPLC-MS/MS in culture supernatants of HSC after 21 days in the (**A**) presence and (**B**) absence (control) of the growth factors HGF and FGF_4. Traces of GCDCA were also detectable in freshly prepared medium without cultured cells (not shown).



Supplemental Figure S7 Quantitation of bile acid synthesis in primary cultures of HSC by UHPLC-MS/MS.

The bile acids α/ω-muricholic acid (α/ω-MCA), β-muricholic acid (β-MCA) and cholic acid (CA) were analyzed by UHPLC-MS/MS in culture supernatants of HSC after 21 days in the (**A**) presence and (**B**) absence (control) of the growth factors HGF and FGF_4.



Supplemental Figure S8 Schematic presentation of the mesodermal to endodermal transition during hepatic differentiation of MSC.

This figure schematically depicts the changes in gene expression of MSC populations such as HSC, HSC clones, bmMSC and UCBSC during their differentiation into hepatocytes (endoderm), as shown in Figure 7. During this process, MSC lose mesodermal characteristics (green; vimentin, desmin) while they transiently acquire the expression profile of oval cells (blue; EPCAM, K19, α-fetoprotein) before becoming hepatocytes (red; albumin, CYP7A1, HNF4α, bile acids).

Supplemental Table S1 Engraftment of retransplanted eGFP$^+$ HSC-derived bone marrow cells varied in different areas of the WT host livers.

The abundance of transplanted HSC-derived bone marrow cells was analysed by qPCR of eGFP mRNA in 6 different areas of the WT host liver (edges and central parts of various liver lobes). Livers from eGFP (100%) and WT rats (0%) were used for normalization.

eGFP mRNA (%)							
liver tissue	**sample 1**	**sample 2**	**sample 3**	**sample 4**	**sample 5**	**sample 6**	**mean 1-6**
WT host rat 1	14.3	8.8	6.1	9.7	8.9	10.7	10 (± 1.1)
WT host rat 2	14.1	13.3	14.0	14.0	12.5	28.0	16 (± 2.4)
WT host rat 3	11.7	43.5	0.01	33.0	34.7	29.3	25 (± 6.6)

Supplemental Table S2 Bile acid concentrations in culture supernatants of HSC primary cultures during hepatic differentiation. The HSC were treated with HGF and FGF_4 for 21 days. As for control ("21 days control"), cells received the same medium but without growth factors. Data are given as means ± SEM (n = 3 independent experiments).

bile acid concentration [nmol/ml ± SEM]	HSC 1 day	HSC 7 days	HSC 14 days	HSC 21 days	HSC 21 days control
cholic acid	2 (± 1)	242 (± 6)	827 (± 50)	1455 (± 167)	1 (± 1)
chenodeoxycholic acid	1 (±1)	250 (± 21)	1007 (± 69)	1503 (± 109)	1 (± 1)
ursodeoxycholic acid	0 (± 0)	9 (± 1)	35 (± 2)	51 (± 3)	0 (± 0)
α/ω-muricholic acid	0 (± 0)	45 (± 3)	145 (± 3)	225 (± 15)	1 (± 1)
β-muricholic acid	1 (± 1)	46 (± 5)	158 (± 6)	197 (± 13)	0 (± 0)
murideoxycholic acid	0 (± 0)	5 (± 1)	18 (± 4)	34 (± 4)	0 (± 0)
hyodeoxycholic acid	0 (± 0)	135 (± 11)	571 (± 44)	1170 (± 55)	0 (± 0)
deoxycholic acid	0 (± 0)	164 (± 11)	197 (± 14)	255 (± 17)	0 (± 0)
lithocholic acid	0 (± 0)	9 (± 1)	27 (± 3)	42 (± 3)	0 (± 0)
tauromuricholic acid	2 (± 1)	10 (± 2)	32 (± 4)	48 (± 4)	0 (± 0)
taurocholic acid	3 (± 1)	69 (± 7)	128 (± 12)	156 (± 6)	3 (± 1)
taurohyodeoxycholic acid	0 (± 0)	21 (± 4)	69 (± 3)	116 (± 12)	0 (± 0)
taurochenodeoxycholic acid	0 (± 0)	17 (± 1)	58 (± 4)	102 (± 8)	0 (± 0)
taurodeoxycholic acid	0 (± 0)	6 (± 1)	11 (± 1)	14 (± 1)	0 (± 0)
glycomuricholic acid	0 (± 0)	20 (± 3)	86 (± 4)	108 (± 5)	0 (± 0)
glycocholic acid	2 (± 1)	96 (± 13)	337 (± 20)	366 (± 19)	3 (± 1)
glycohyodeoxycholic acid	0 (± 0)	17 (± 0)	61 (± 6)	85 (± 3)	0 (± 0)
glycochenodeoxy cholic acid	0 (± 0)	39 (± 2)	119 (± 20)	151 (± 13)	0 (± 0)
glycodeoxycholic acid	0 (± 0)	8 (± 1)	23 (± 4)	39 (± 4)	0 (± 0)

The bile acids hyocholic acid, 7-oxo-deoxycholic acid, dehydrocholic acid, lithocholic acid sulphate, glycohyocholic acid, glycoursodeoxy cholic acid, glycolithocholic acid, taurohyocholic acid, tauroursodeoxycholic acid and taurolithocholic acid were also analyzed, but remained undetectable in the culture supernatants (not shown).

Supplemental Table S3 Bile acid concentration in culture supernatants of HSC clones during hepatic differentiation. The HSC clones were treated with HGF and FGF_4 for 21 days. As for control ("21 days control"), cells received the same medium but without growth factors. Data are given as means ± SEM (n = 3 independent experiments).

bile acid concentration [nmol/ml ± SEM]	HSC clones 1 day	HSC clones 7 days	HSC clones 14 days	HSC clones 21 days	HSC clones 21 days control
cholic acid	0 (± 0)	207 (± 2)	511 (± 8)	838 (± 115)	0 (± 0)
chenodeoxycholic acid	0 (± 0)	216 (± 10)	615 (± 51)	920 (± 83)	0 (± 0)
ursodeoxycholic acid	0 (± 0)	7 (± 1)	15 (± 15)	29 (± 3)	0 (± 0)
α/ω-muricholic acid	0 (± 0)	31 (± 7)	83 (± 11)	145 (± 5)	0 (± 0)
β-muricholic acid	0 (± 0)	30 (± 5)	73 (± 6)	124 (± 5)	0 (± 0)
murideoxycholic acid	0 (± 0)	4 (± 0)	11 (± 1)	17 (± 3)	0 (± 0)
hyodeoxycholic acid	0 (± 0)	134 (± 5)	377 (± 38)	564 (± 88)	0 (± 0)
deoxycholic acid	0 (± 0)	139 (± 17)	171 (± 18)	193 (± 1)	0 (± 0)
lithocholic acid	0 (± 0)	7 (± 2)	17 (± 1)	26 (± 2)	0 (± 0)
tauromuricholic acid	0 (± 0)	6 (± 1)	14 (± 1)	20 (± 4)	0 (± 0)
taurocholic acid	0 (± 0)	18 (± 1)	49 (± 4)	68 (± 6)	0 (± 0)
taurohyodeoxycholic acid	0 (± 0)	17 (± 3)	50 (± 4)	75 (± 11)	0 (± 0)
taurochenodeoxycholic acid	0 (± 0)	16 (± 1)	45 (± 4)	64 (± 8)	0 (± 0)
taurodeoxycholic acid	0 (± 0)	2 (± 1)	7 (± 1)	8 (± 2)	0 (± 0)
glycomuricholic acid	0 (± 0)	17 (± 2)	47 (± 6)	61 (± 2)	0 (± 0)
glycocholic acid	0 (± 0)	63 (± 1)	168 (± 8)	226 (± 8)	0 (± 0)
glycohyodeoxycholic acid	0 (± 0)	16 (± 2)	40 (± 4)	74 (± 10)	0 (± 0)
glycochenodeoxy cholic acid	0 (± 0)	38 (± 6)	76 (± 10)	118 (± 24)	0 (± 0)
glycodeoxycholic acid	0 (± 0)	8 (± 3)	11 (± 1)	21 (± 1)	0 (± 0)

The bile acids hyocholic acid, 7-oxo-deoxycholic acid, dehydrocholic acid, lithocholic acid sulphate, glycohyocholic acid, glycoursodeoxy cholic acid, glycolithocholic acid, taurohyocholic acid, tauroursodeoxycholic acid and taurolithocholic acid were also analyzed, but remained undetectable in the culture supernatants (not shown).

Supplemental Table S4 Bile acid concentration in culture supernatants of bmMSC during hepatic differentiation. The bmMSC were treated with HGF and FGF_4 for 21 days. As for control ("21 days control"), cells received the same medium but without growth factors. Data are given as means ± SEM (n = 3 independent experiments).

bile acid concentration [nmol/ml ± SEM]	bmMSC 1 day	bmMSC 7 days	bmMSC 14 days	bmMSC 21 days	bmMSC 21 days control
cholic acid	0 (± 0)	211 (±13)	684 (± 62)	901 (± 101)	0 (± 0)
chenodeoxycholic acid	0 (± 0)	255 (± 31)	627 (± 39)	1159 (± 104)	0 (± 0)
ursodeoxycholic acid	0 (± 0)	6 (± 2)	29 (± 3)	38 (± 5)	0 (± 0)
α/ω-muricholic acid	0 (± 0)	32 (± 5)	118 (± 10)	160 (± 10)	0 (± 0)
β-muricholic acid	0 (± 0)	24 (± 5)	72 (± 20)	140 (± 8)	0 (± 0)
murideoxycholic acid	0 (± 0)	4 (± 0)	15 (± 4)	17 (± 2)	0 (± 0)
hyodeoxycholic acid	0 (± 0)	166 (± 30)	584 (± 110)	807 (± 101)	0 (± 0)
deoxycholic acid	0 (± 0)	134 (± 2)	156 (± 20)	191 (± 6)	0 (± 0)
lithocholic acid	0 (± 0)	9 (± 1)	21 (± 5)	29 (± 4)	0 (± 0)
tauromuricholic acid	0 (± 0)	5 (± 1)	15 (± 3)	25 (± 4)	0 (± 0)
taurocholic acid	0 (± 0)	23 (± 3)	59 (± 10)	94 (± 9)	0 (± 0)
taurohyodeoxycholic acid	0 (± 0)	24 (± 3)	63 (± 9)	107 (± 11)	0 (± 0)
taurochenodeoxycholic acid	0 (± 0)	19 (± 3)	47 (± 5)	78 (± 5)	0 (± 0)
taurodeoxycholic acid	0 (± 0)	4 (± 0)	6 (± 1)	11 (± 1)	0 (± 0)
glycomuricholic acid	0 (± 0)	16 (± 3)	54 (± 1)	89 (± 4)	0 (± 0)
glycocholic acid	0 (± 0)	74 (± 5)	173 (± 2)	301 (± 17)	0 (± 0)
glycohyodeoxycholic acid	0 (± 0)	17 (± 2)	64 (± 9)	63 (± 3)	0 (± 0)
glycochenodeoxy cholic acid	0 (± 0)	40 (± 6)	81 (± 10)	128 (± 14)	0 (± 0)
glycodeoxycholic acid	0 (± 0)	6 (± 1)	16 (± 1)	27 (± 1)	0 (± 0)

The bile acids hyocholic acid, 7-oxo-deoxycholic acid, dehydrocholic acid, lithocholic acid sulphate, glycohyocholic acid, glycoursodeoxy cholic acid, glycolithocholic acid, taurohyocholic acid, tauroursodeoxycholic acid and taurolithocholic acid were also analyzed, but remained undetectable in the culture supernatants (not shown).

Supplemental Table S5 Bile acid concentration in culture supernatants of UCBSC during hepatic differentiation. The UCBSC were treated with HGF and FGF_4 for 21 days. As for control ("21 days control"), cells received the same medium but without growth factors. Data are given as means ± SEM (n = 3 independent experiments).

bile acid concentration [nmol/ml ± SEM]	UCBSC 1 day	UCBSC 7 days	UCBSC 14 days	UCBSC 21 days	UCBSC 21 days control
cholic acid	0 (± 0)	180 (± 15)	371 (± 23)	699 (± 47)	1 (± 1)
chenodeoxycholic acid	0 (± 0)	194 (± 3)	386 (± 4)	754 (± 6)	0 (± 0)
ursodeoxycholic acid	0 (± 0)	4 (± 1)	12 (± 1)	24 (± 2)	0 (± 0)
α/ω-muricholic acid	0 (± 0)	36 (± 1)	59 (± 5)	99 (± 3)	0 (± 0)
β-muricholic acid	0 (± 0)	28 (± 4)	52 (± 4)	80 (± 8)	0 (± 0)
murideoxycholic acid	0 (± 0)	5 (± 1)	10 (± 0)	17 (± 1)	0 (± 0)
hyodeoxycholic acid	0 (± 0)	140 (± 15)	312 (± 3)	585 (± 14)	0 (± 0)
deoxycholic acid	3 (± 1)	159 (± 5)	178 (± 4)	181 (± 3)	3 (± 1)
lithocholic acid	0 (± 0)	8 (± 1)	14 (± 2)	22 (± 1)	0 (± 0)
tauromuricholic acid	0 (± 0)	4 (± 0)	8 (± 1)	15 (± 1)	0 (± 0)
taurocholic acid	0 (± 0)	19 (± 1)	30 (± 2)	52 (± 6)	0 (± 0)
taurohyodeoxycholic acid	0 (± 0)	13 (± 2)	30 (± 2)	56 (± 4)	0 (± 0)
taurochenodeoxycholic acid	0 (± 0)	13 (± 1)	25 (± 2)	47 (± 0)	0 (± 0)
taurodeoxycholic acid	0 (± 0)	2 (± 1)	4 (± 0)	6 (± 1)	0 (± 0)
glycomuricholic acid	0 (± 0)	13 (± 2)	25 (± 4)	53 (± 1)	0 (± 0)
glycocholic acid	0 (± 0)	46 (± 6)	91 (± 5)	187 (± 17)	0 (± 0)
glycohyodeoxycholic acid	0 (± 0)	11 (± 1)	24 (± 1)	42 (± 5)	0 (± 0)
glycochenodeoxy cholic acid	0 (± 0)	30 (± 3)	44 (± 2)	79 (± 0)	0 (± 0)
glycodeoxycholic acid	0 (± 0)	10 (± 1)	12 (± 2)	18 (± 3)	0 (± 0)

The bile acids hyocholic acid, 7-oxo-deoxycholic acid, dehydroocholic acid, lithocholic acid sulphate, glycohyocholic acid, glycoursodeoxy cholic acid, glycolithocholic acid, taurohyocholic acid, tauroursodeoxycholic acid and taurolithocholic acid were also analyzed, but remained undetectable in the culture supernatants (not shown).

Supplemental Table S6 Primers for RT-PCR

RT-PCR				
Gene	**Forward Primer**	**Reverse Primer**	**bp**	**Accession No.**
α-SMA	TGCTGGACTCTGGAGATG	GTGATCACCTGCCCATC	292	X06801
β-actin	GCCCTAGACTTCGAGCAAGA	CAGTGAGGCCAGGATAGAGC	390	NM_031144
CD73	ACACTCTGGTTTCGAGATGGAT	ATTTCATCTGGGTGTCTGAGGT	480	NM_021576
CD146	ATCTCTGTGTGGCATCTGTCC	ACTATCACAGCCACGATGACC	487	NM_023983
CD271	GCCTTGTGGCCTATATTGCTT	CTCGCTGCATAGACTCTCCAC	458	NM_012610
procollagen I α2	ACCTCAGGGTGTTCAAGGTG	CGGATTCCAATAGGACCAGA	222	NM_053356
desmin	GACCTAGAGCGCAGAATTGAGT	GCCATCTCATCCTTTAGGTGTC	476	NM_022531
GFAP	ACATCGAGATCGCCACCTAC	TCCACCGTCTTTACCACGAT	163	L27219
eGFP	AGGACGACGGCAACTACAAG	CTGGGTGCTCAGGTAGTGGT	311	EU056364
nestin	GAGTGTCGCTTAGAGGTGCAA	TGTCACAGGAGTCTCAAGGGTA	450	NM_012987
NG2	CTGAGGTGAATGCTGGGAATA	GTCAGCTCAGATTGCAGGAAG	394	NM_031022
PDGFRβ	ACACTCCAACAAGCATTGTCC	GGCTGTTGAAGATGCTCTCTG	527	AF359356
synemin	GATCTGGACCGAGAACATTGA	CCGTTGGAATACAAAGTCGAG	162	NM_001134858
UGT1A1	CCAGGAATTTGAAGCCTATGTC	CGCATGATGTTCTCCTTGTAAC	465	NM_012683
vimentin	GAACGTAAAGTGGAATCCTTGC	GTCTCCGGTATTCGTTTGACTC	304	NM_031140

Supplemental Table S7 Primers for qPCR

qPCR				
Gene	**Forward Primer**	**Reverse Primer**	**bp**	**Accession No.**
α-fetoprotein	ACCTGACAGGGAAGATGGTG	GCAGTGGTTGATACCGGAGT	155	NM_012493
β-actin (DNA)	TTAACTTTCCGCCTAGGGTGT	CCAATACTGTGTCCCCTCAAG	188	NC_005111
albumin	CTTCAAAGCCTGGGCAGTAG	GCACTGGCTTATCACAGCAA	221	V01222
CYP7A1	CACCATTCCTGCAACCTTTT	GTACCGGCAGGTCATTCAGT	170	NM_012942
desmin	AGCCTGGGTCAGAGACAGAA	TATCTCCTGCTCCCACATCC	166	NM_022531
eGFP	GGGCACAAGCTGGAGTACAA	GGGTGTTCTGCTGGTAGTGGT	148	EU056364
EPCAM	TGCATACTGCACTTCAGGACA	GGAACAAGGACTCCCCCTTTA	195	NM_138541
HNF4α	AAATGTGCAGGTGTTGACCA	CACGCTCCTCCTGAAGAATC	178	NM_022180
HPRT1	AAGTGTTGGATACAGGCCAGA	GGCTTTGTACTTGGCTTTTCC	145	NM_012583
K19	AGTAACGTGCGTGCTGACAC	AGTCGCACTGGTAGCAAGGT	193	NM_199498
LGR5	TTGCAGAGCCTGATACCATCT	TCTTACGAAGGTCGTCCACAC	160	NM_001106784
LRAT	GACCTACTGCAGATACGGCTC	TATGATGCCAGGCCTGTGTAG	147	NM_022280
SRY (DNA)	AGCCTCATCGAAGGGTTAAAG	GAGGACTGGTGTGCAGCTCTA	151	AF274872
SOX9	TCTCTCCTAACGCCATCTTCA	AGATCAACTTTCCCAGCTTGC	163	XM_001081628
vimentin	GAACGTAAAGTGGAATCCTTGC	GTCTCCGGTATTCGTTTGACTC	304	NM_031140