Supplementary data

Table S1. Information and dilution ratio of antibodies

	Catalog no.	Vendor	Dilution ratio
Primary antibodies			
rabbit monoclonal anti-human CD90 IgG antibody	ab92574	abcam, Cambridge, MA	1:100
mouse monoclonal anti-human CD24 IgG antibody	ab76514	abcam, Cambridge, MA	1:100
mouse monoclonal anti-human CD31 IgG antibody	ab9498	abcam, Cambridge, MA	1:25
mouse monoclonal anti-human CD45 IgG antibody	ab8216	abcam, Cambridge, MA	1:1000
mouse monoclonal anti-human CD133 IgG antibody	MAB4399	Milipore, Temecula, CA	1:100
HRP-conjugated secondary antibodies			
goat polyclonal anti-rabbit IgG H&L antibody	ab6721	abcam, Cambridge, MA	1:200
goat polyclonal anti-mouse IgG H&L antibody	ab6789	abcam, Cambridge, MA	1:200
Fluorochrome-conjugated secondary antibodies			
DyLight® 488 goat anti-rabbit IgG antibody and	DI-1488	Vector laboratories, Burlingame, CA	1:200
DyLight® 549 horse anti-mouse IgG antibody	DI-2549	Vector laboratories, Burlingame, CA	1:200

Abbreviation: HRP, horseradish peroxidase

Table S2A. Mean (S.E.), median, and least square mean of percentage of CD90+ cancer cells/hepatocytes

	Mean (S.E.)	Median (Range)	Least square mean*(S.E.)
Normal liver	0.16 (0.06) %	0 (0-0.55) %	0.64 (1.05) %
Cirrhosis	0.50 (0.16) %	0.26 (0-3.07) %	0.48 (0.77) %
Early-stage HCC	5.01 (0.39) %	4.39 (0-14.92) %	4.96 (0.43) %
Late-stage HCC	6.68 (0.48) %	6.63 (0-17.91) %	6.64 (0.39) %

* adjusted for age and gender

Table S2B. Mean ± S.E., median, and least square mean of level of CD90 expression on tumor region (OD/area, $\times 10^{-3}$ /μm^2)

	Mean (S.E.)	Median (Range)	Least square mean*(S.E.)
Normal liver	2.5 (0.8)	1.0 (0-11.9)	9.3 (11.1)
Cirrhosis	23.1 (6.1)	9.9 (0.1-97.1)	22.0 (8.1)
Early-stage HCC	40.7 (4.1)	32.2 (2.1-147.7)	40.2 (4.6)
Late-stage HCC	52.1 (4.8)	38.3 (4.8 -245.8)	51.6 (4.1)

* adjusted for age and gender

Table S2C. Mean ± S.E., median, and least square mean of level of CD90 expression on stromal region (OD/area, $\times 10^{-3}$ /μm^2)

	Mean (S.E.)	Median (Range)	Least square mean*(S.E.)
Normal liver	37.9 (19.2)	3.4 (0.2-167.9)	33.0 (64.4)
Cirrhosis	165.4 (33.9)	143.8 (13.8-633.3)	164.7 (39.0)
Early-stage HCC	226.3 (27.1)	187.3 (2.7-736.0)	227.3 (25.1)
Late-stage HCC	193.9 (21.6)	146.1 (0.5-835.3)	194.1 (21.5)

* adjusted for age and gender

Table S2D. Mean ± S.E., median, and least square mean of level of overall CD90 expression (OD/area, $\times 10^{-3}$ /μm^2)

	Mean (S.E.)	Median (Range)	Least square mean*(S.E.)
Normal liver	5.6 (2.1)	1.1 (0-24.0)	14.1(18.1)
Cirrhosis	59.4 (11.4)	43.1 (1.0-178.8)	58.1 (12.9)
Early-stage HCC	63.6 (7.5)	41.1 (2.1-331.9)	62.9 (7.3)
Late-stage HCC	73.9 (6.9)	55.3 (6.5-306.9)	73.4 (6.6)

* adjusted for age and gender

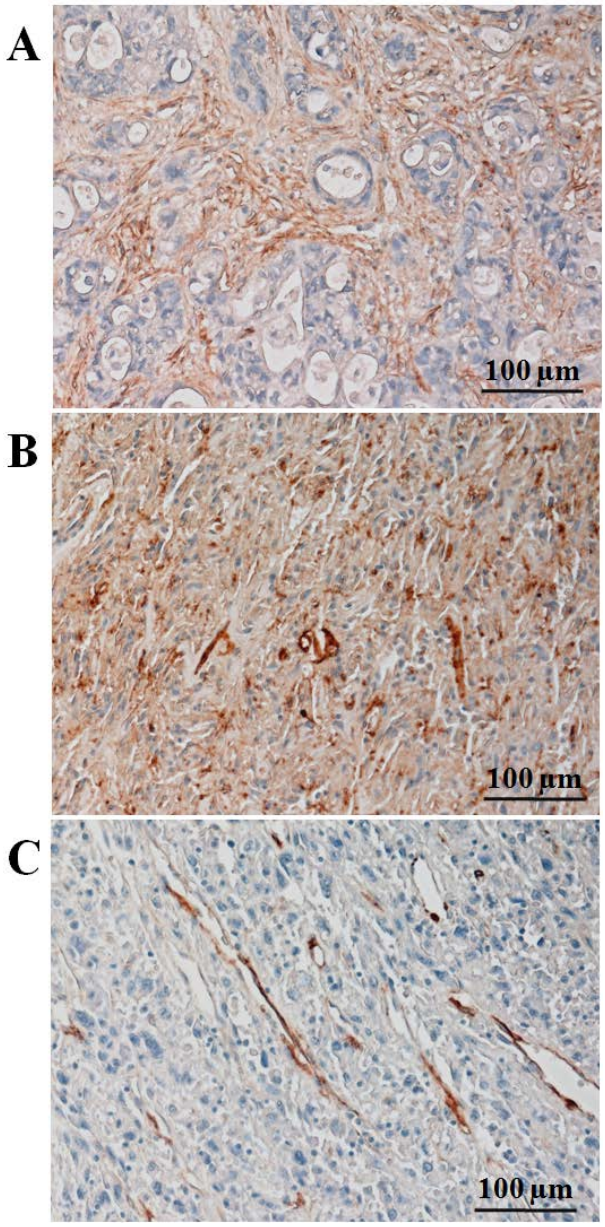

Figure S1. CD90 expression in non-HCC liver tumors
(A) Intrahepatic cholangiocarcinoma. No CD90+ neoplastic cell was observed.
(B) Hepatic malignant fibrohistiocytoma. Weak expression of CD90 was seen in most of neoplastic cells while few of them showed strong expression.
(C) Hepatic angiosacroma. CD90 was expressed intensely in perivascular area.

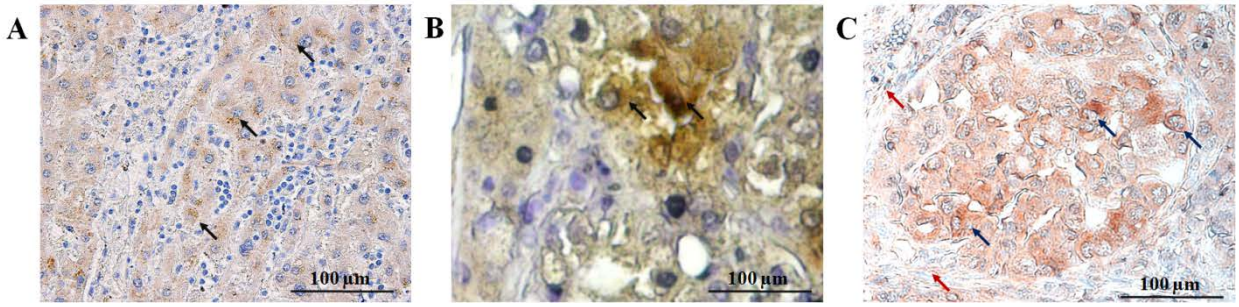

Figure S2. Expression of CD24 and CD133 in hepatocellular carcinoma
(A) CD24 expression was found in cytoplasm of neoplastic cells in various levels. Arrows indicated CD24+ cells.
(B) Cytoplasmic expression of CD44 was observed in neoplastic cells in various levels. Arrows indicated CD24+ cells.
(C) Various intensity of CD133 cytoplasmic expression was observed in neoplastic cells. However, some stromal cells also expressed CD133. Red arrows indicated CD133+ stromal cells. CD133+ neoplastic cells were indicated by blue arrows.