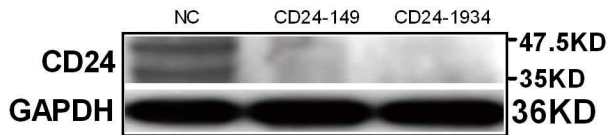
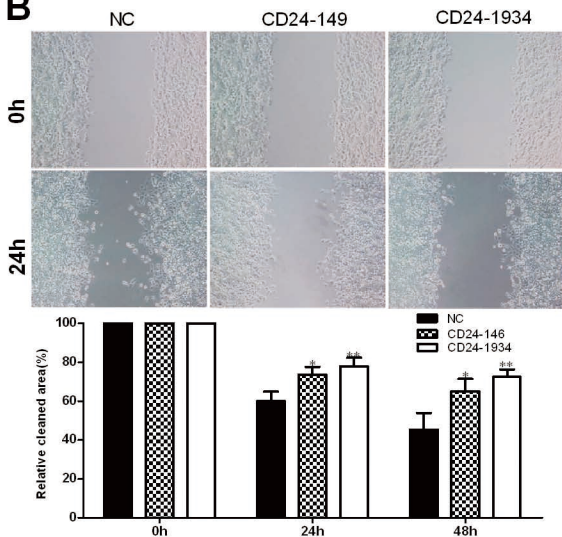


**Figure S1**

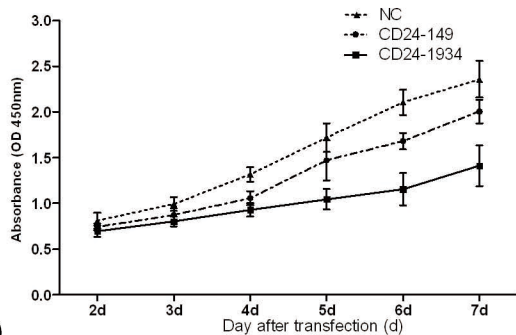
**A**



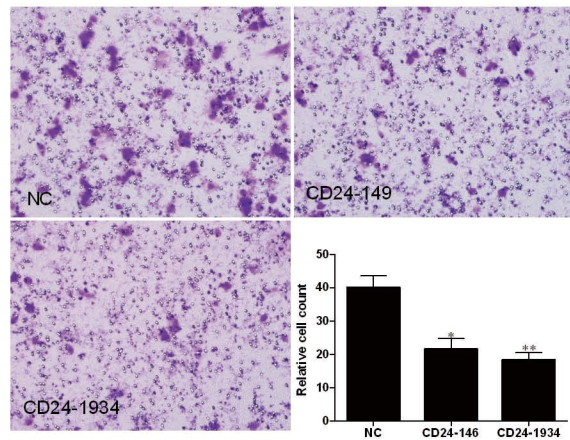
**B**



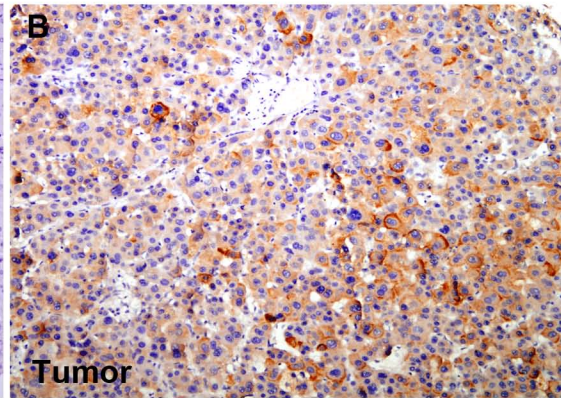
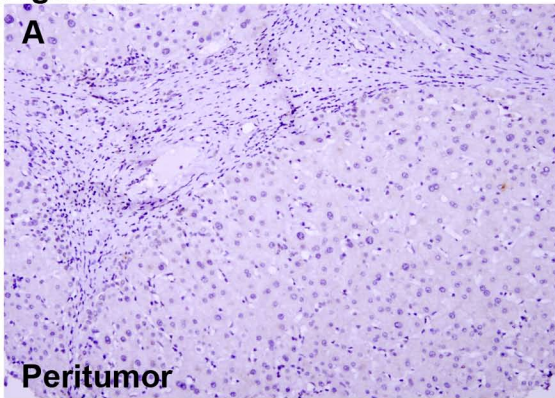
**C**



**D**

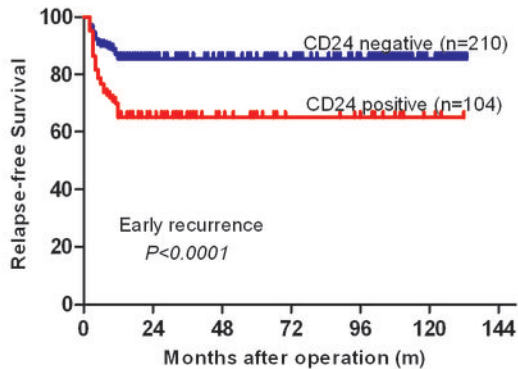


**Figure S2**

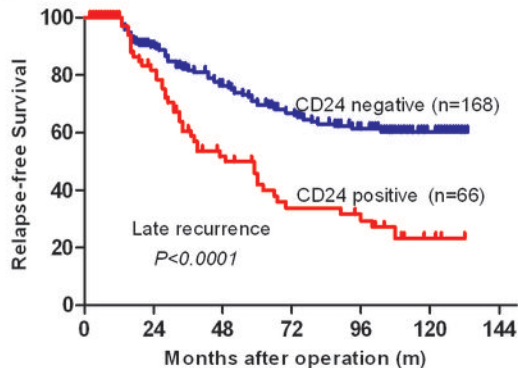


# Figure S3

## A

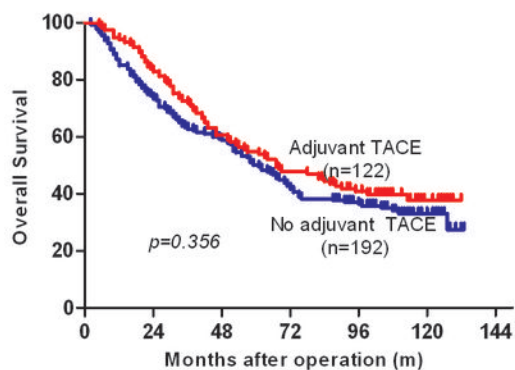
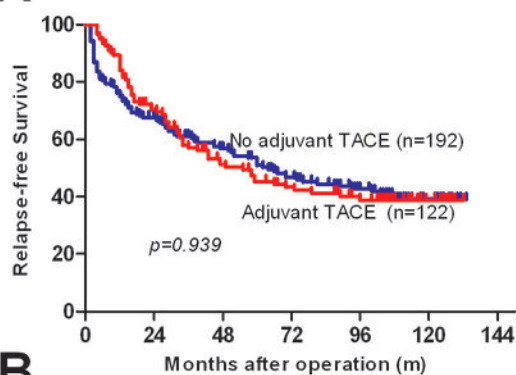


## B

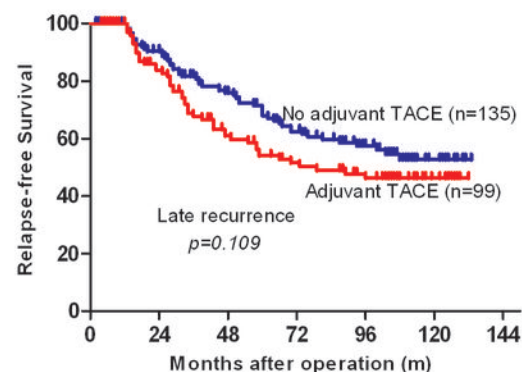
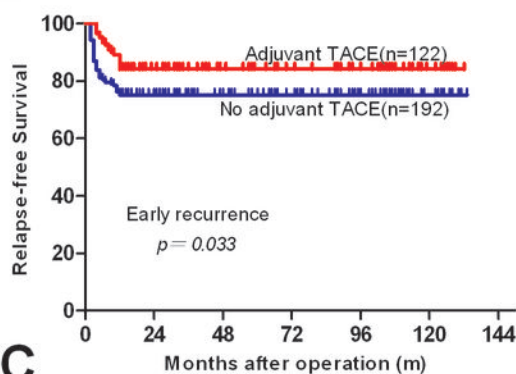


# Figure S4

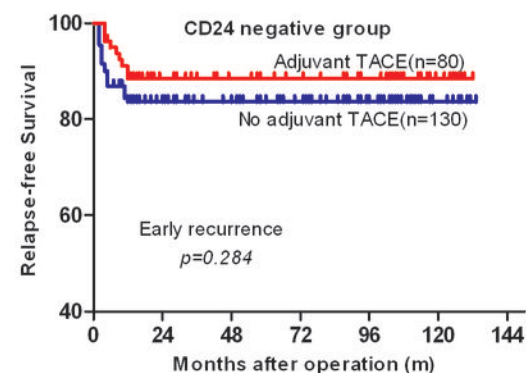
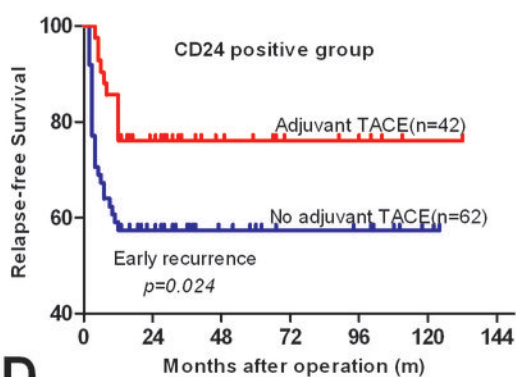
**A**



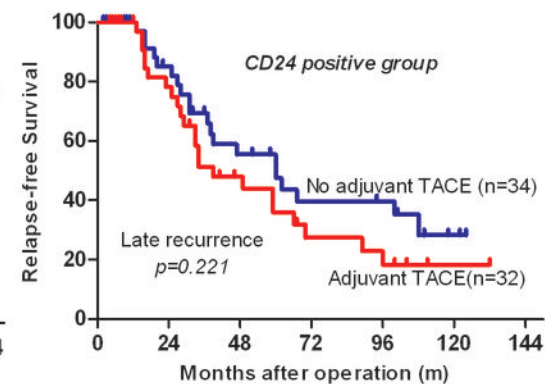
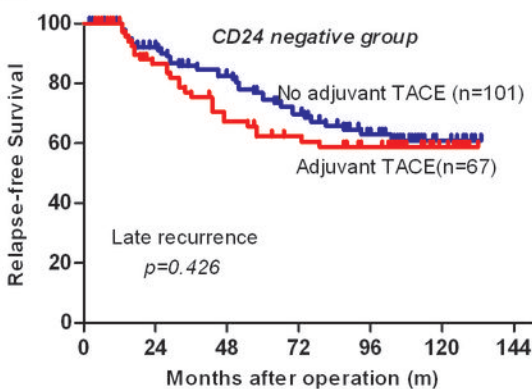
**B**



**C**



**D**



### **Figure S1. Function analysis after CD24-siRNA in HCCLM3**

CD24 expression in HCCLM3 was decreased significantly after treated by siRNA for 72h according to western blot analysis (**A**); Cells proliferation was detected by MTT assay (The graphs depict means  $\pm$  SD of results generated from individual experiments with 3 replicate assays) (**B**); Monolayer of negative siRNA or CD24-siRNA HCCLM3 cells was abraded and then monitored at 0, 24, and 48 h for wound channel closure. The cleaned area was measured and plotted as the percentage of the original time point (0h); Data shown are mean ( $\pm$ SD) from three independent experiments (**C**); invasive behavior tested by trans-well Matrigel invasion assays (**D**). (Magnification $\times$ 100 in **C** and  $\times$ 200 in **D**)

### **Figure S2. Expression of CD24 in peritumoral and tumor tissues**

The represent pictures for CD24 expression in peritumoral tissues (**A**) and tumor tissues (**B**); Most of peritumoral tissues was negative or low staining for CD24 and there were only 13 cases with positive score (13%, 13/100) in 100 case peritumoral tissues. There has 33.12% (104/314) with positive score in 314 HCC patients. There has significant difference expression of CD24 was between tumor and peritumoral tissues ( $p<0.0001$ ). (Magnification,  $\times$ 100)

### **Figure S3. Kaplan-Meier analysis for the prognostic significance of CD24 in early recurrence and later recurrence**

Kaplan-Meier analysis of RFS for CD24 expression in early recurrence groups (**A**) and later recurrence group (**B**); the prognostic significance of CD24 existed in both early recurrence and late recurrence groups ( $p<0.0001$  for both).

**Figure S4. Kaplan-Meier analysis for adjuvant TACE in early recurrence and later recurrence stratified by CD24**

Kaplan-Meier analysis of RFS and OS for adjuvant TACE in 314 cases **(A)**; The effect of TACE in early recurrent and later recurrent groups **(B)**; The effect of TACE in CD24-negative and CD24-positive HCC patients with early recurrence **(C)**; The effect of TACE in CD24-negative and CD24-positive HCC patients with later recurrence **(D)**.

**Abbreviations:** qRT-PCR, quantitative real-time polymerase chain reaction; siRNA, small interference RNA; AFP, alpha-fetoprotein; TNM, tumor-node-metastasis; TACE, transcatheter arterial chemoembolization; RFS, Relapse-free survival; OS, overall survival.

**Table S1. The clinical/pathological characteristics of 314 cases of HCC**

Clinical and pathological indexes		Number	Percentage (%)
Age (y)	≤52	165	52.55
	>52	149	47.45
Sex	Female	48	15.29
	Male	266	84.71
Liver cirrhosis	No	26	8.28
	Yes	288	91.72
Child-Pugh	A	312	99.36
	B	2	0.64
HBsAg	Negative	55	17.52
	Positive	259	82.48
HCV	Negative	309	98.41
	Positive	5	1.59
GGT (U/l)	≤54	152	48.41
	>54	162	51.59
ALT (U/l)	≤75	274	87.26
	>75	40	12.74
AFP	≤20ng/ml	163	51.91
	>20ng/ml	151	48.09
Tumor encapsulation <sup>†</sup>	Complete	174	55.41
	None	137	43.63
Tumor differentiation	I-II	227	72.29
	III-IV	87	27.71
Tumor size	≤5cm	171	54.46
	>5cm	143	45.54
Tumor number	Single	267	85.03
	Multiple	47	14.97
Vascular invasion	No	267	85.03
	Yes	47	14.97
Satellite lesion	NO	286	91.08
	Yes	28	8.92
CLIP Stage	0+1	248	78.98
	2+3+4	66	21.02
TNM Stage	I	228	72.61
	II-III	86	27.39
Adjuvant TACE	No	192	61.15
	Yes	122	38.85
CD24	Negative	210	66.88
	Positive	104	33.12
□β-catenin	Negative	188	59.87
	Positive	126	40.13

PCNA	Negative	226	71.97
	Positive	88	28.03

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**Abbreviations:** AFP, alpha-fetoprotein; ALT, alanine aminotransferase; GGT, gammaglutamyl transferase; TACE, transcatheter arterial chemoembolization; TNM, tumor-node-metastasis; CLIP, Cancer of Liver Italian Program.

<sup>†</sup>3 cases without capsulation information were not calculated.



**Table S2. Correlation between CD24 and clinicopathological characteristics**

Clinicopathological indexes		CD24 <sup>-</sup> (n=210)	CD24 <sup>+</sup> (n=104)	P value
Sex	Female	31	17	0.714
	Male	179	87	
Age (y)	≤52	111	54	0.876
	>52	99	50	
HBsAg	Negative	39	16	0.484
	Positive	171	88	
HCV <sup>†</sup>	Negative	208	101	0.198
	Positive	2	3	
Liver cirrhosis <sup>†</sup>	No	22	4	0.051
	Yes	188	100	
ALT (U/l)	≤75	185	89	0.529
	>75	25	15	
Child-Pugh score <sup>†</sup>	A	209	103	0.611
	B	1	1	
GGT(U/l)	≤54	100	52	0.691
	>54	110	52	
AFP (ng/ml)	≤20	96	67	0.002
	>20	114	37	
Tumor encapsulation <sup>§</sup>	complete	110	64	0.159
	no	97	40	
Tumor size (cm)	≤5	120	51	0.175
	>5	90	53	
Tumor number	Single	184	83	0.068
	Multiple	26	21	
Vascular invasion	No	176	91	0.388
	Yes	34	13	
satellite	No	191	95	0.908
	Yes	19	9	
TNM stage	I	156	72	0.344
	II-III	54	32	
Tumor differentiation	I-II	149	78	0.451
	III-IV	61	26	
CLIP stage	0+1	163	85	0.400
	2+3+4	47	19	
Adjuvant TACE	No	130	62	0.695
	Yes	80	42	
Recurrence time(m)	≤12	30	36	0.104
	>12	60	43	
Recurrence types <sup>‡</sup>	Type I	69	49	0.039
	Type II and III	21	30	
β-catenin	negative	135	53	0.023

	positive	75	51	
PCNA	≤50%	160	66	0.018
	>50%	50	38	

Abbreviations: ALT, alanine aminotransferase; AFP, alpha-fetoprotein; GGT, gammaglutamyl transferase; TACE, transcatheter arterial chemoembolization; TNM, tumor-node-metastasis; CLIP, Cancer of Liver Italian Program.

<sup>†</sup>Fisher's exact tests; Chi-square tests for all the other analyses.

<sup>§</sup> 3 cases without capsulation information were not calculated.

<sup>‡</sup> Type I was local recurrence in remnant liver with a single or double lesion (n = 119); Type II was multinodular (≥3) or diffuse pattern consisting of many nodules scattered throughout the remaining liver (n = 23); Type III was extrahepatic metastasis (n = 27).

**Table S3. Correlation between peritumoral CD24 expression and clinicopathological characteristics in 100 patients.**

Clinicopathological indexes		CD24 <sup>-</sup> (n=87)	CD24 <sup>+</sup> (n=13)	P value
Sex <sup>†</sup>	Female	7	2	0.331
	Male	80	11	
Age (y)	≤52	48	6	0.543
	>52	39	7	
HBsAg <sup>†</sup>	Negative	24	3	1.000
	Positive	63	10	
HCV <sup>†</sup>	Negative	84	12	0.432
	Positive	3	1	
Liver cirrhosis <sup>†</sup>	No	11	2	0.676
	Yes	76	11	
ALT (U/l) <sup>†</sup>	≤75	77	13	0.351
	>75	10	0	
Child-Pugh score <sup>†</sup>	A	86	13	1.000
	B	1	0	
GGT(U/l)	≤54	41	5	0.559
	>54	46	8	
AFP (ng/ml)	≤20	46	7	0.948
	>20	41	6	
Tumor encapsulation	complete	46	8	0.559
	no	41	5	
Tumor size (cm)	≤5	36	6	0.745
	>5	51	7	
Tumor number <sup>†</sup>	Single	76	13	0.350
	Multiple	11	0	
Vascular invasion <sup>†</sup>	No	75	11	1.000
	Yes	12	2	
satellite <sup>†</sup>	No	75	13	0.356
	Yes	12	0	
TNM stage <sup>†</sup>	I	64	11	0.508
	II-III	23	2	
Tumor differentiation <sup>†</sup>	I-II	66	7	0.173
	III-IV	21	6	
CLIP stage <sup>†</sup>	0+1	65	10	1.000
	2+3+4	22	3	
Recurrence time(m) <sup>†</sup>	≤12	23	4	1.000
	>12	10	11	

Abbreviations: ALT, alanine aminotransferase; AFP, alpha-fetoprotein; GGT, gammaglutamyl transferase; TACE, transcatheter arterial chemoembolization; TNM, tumor-node-metastasis; CLIP, Cancer of Liver Italian Program.

<sup>†</sup>Fisher's exact tests; Chi-square tests for all the other analyses.