Table SI. Details of all antibodies used in the present study.

Antibody	Manufacturer	Cat. no.	Dilution	Molecular weight, kDa
NCAPD2	Wuhan Sanying Biotechnology	13382-1-AP	WB,1:1,000; IHC, 1:400	157
Ki67	Maxim Biotechnology	RMA-0731	IHC, 1:400	Not applicable
AKT	Cell Signaling Technology, Inc.	4691S	WB,1:1,000	60
p-AKT	Cell Signaling Technology, Inc.	4060S	WB,1:1,000	60
PI3K	Cell Signaling Technology, Inc.	4257S	WB,1:1,000	85
p-PI3K	Cell Signaling Technology, Inc.	4228S	WB,1:1,000	60
mTOR	Cell Signaling Technology, Inc.	2983S	WB,1:1,000	289
p-mTOR	Cell Signaling Technology, Inc.	5536S	WB,1:1,000	289
c-Myc	Abcam	ab32072	WB,1:1,000	57
E-cadherin	Cell Signaling Technology, Inc.	3195S	WB,1:1,000	135
N-cadherin	Cell Signaling Technology, Inc.	13116S	WB,1:1,000	140
Vimentin	Cell Signaling Technology, Inc.	5741S	WB,1:1000	57
GAPDH	Wuhan Sanying Biotechnology	60004-1-Ig	WB,1:50,000	36

mTOR, mammalian target of rapamycin; NCAPD2, non-SMC condensin I complex subunit D2; p-, phosphorylated; PI3K, phosphatidylinositol 3-kinase.

Table SII. Sequence information for reverse transcription-quantitative PCR primers and siRNAs.

Name	Sequence, 5'-3'
Human-*NCAPD2*	F: TCCTGTTGATGAACCTGCTGTCC
	R: TGGTCTTGTGCTCCTGTTCTTCC
Human-*GAPDH*	F:CGGAGTCAACGGATTTGGTCGTATTGG
	R:GCTCCTGGAAGATGGTGATGGGATTTCC
si-NCAPD2	GAACU GUUAU GCUCU GAUATT
si-NC	UUCUC CGAAC GUGUC ACGUTT

NC, negative control (scramble siRNA); NCAPD2, non-SMC condensin I complex subunit D2; si, small interfering.

Table SIII. Details of the single cell RNA-sequencing datasets used in the present study.

Dataset name	Species	Samples size	Cell counts[a]	Types	Platform	Yearof last submission
GSE140228	Human	41	11,134	HCC	GPL20301;Illumina HiSeq 4000, 10x Genomics	2019
GSE112271	Human	7	31,265	HCC	GPL16791;Illumina HiSeq 2500, 10x Genomics	2018

[a]In single cell sequencing. HCC, hepatocellular carcinoma.

Table SIV. Association analysis of *NCAPD2* expression and clinicopathological characteristics in patients with liver cancer (n=374).

Characteristic	*NCAPD2* expression		P-value
	Low (n=187)	High (n=187)	
Male sex, n (%)	133 (35.6%)[c]	120 (32.1%)	0.151[a]
Age, n (%)			0.004[a]
≤60 years	75 (20.1%)	102 (27.3%)	
>60 years	112 (30%)	84 (22.5%)	
BMI, n (%)			0.071[a]
≤25 kg/m^2	81 (24%)	96 (28.5%)	
>25 kg/m^2	89 (26.4%)	71 (21.1%)	
Pathological TNM stage, n (%)			0.012[a]
Stage I + Stage II	138 (39.4%)	122 (34.9%)	
Stage III + Stage IV	34 (9.7%)	56 (16%)	
Pathological T stage, n (%)			0.015[a]
T1 + T2	148 (39.9%)	130 (35%)	
T3 + T4	36 (9.7%)	57 (15.4%)	
Pathological N stage, n (%)			0.739[b]
N0	117 (45.3%)	137 (53.1%)	
N1	1 (0.4%)	3 (1.2%)	
Pathological M stage, n (%)			0.553[b]
M0	127 (46.7%)	141 (51.8%)	
M1	3 (1.1%)	1 (0.4%)	
Histological grade, n (%)			<0.001[a]
Grade 1 + Grade 2	140 (37.9%)	93 (25.2%)	
Grade 3 + Grade 4	44 (11.9%)	92 (24.9%)	
Residual tumor, n (%)			0.692[a]
R0	166 (48.1%)	161 (46.7%)	
R1 + R2	10 (2.9%)	8 (2.3%)	
AFP, n (%)			<0.001[a]
≤400 ng/ml	127 (45.4%)	88 (31.4%)	
>400 ng/ml	17 (6.1%)	48 (17.1%)	
Ishak fibrosis score, n (%)			0.144[a]
0-2	64 (29.8%)	42 (19.5%)	
3-6	55 (25.6%)	54 (25.1%)	

[a]χ^2 test; [b]Fisher's exact test.[c]Percentage statistics (%) represent the proportion of subtypes in the total number of patients with liver cancer.The total number of patients was <187 for some variables due to the lack of some clinical information.Patients were divided into *NCAPD2* high and low expression groups according to the median cutoff value. AFP, α-fetoprotein; BMI, body mass index; *NCAPD2*, non-SMC condensin I complex subunit D2.

Table SV. Uni-cox and multi-cox regression analyses of overall survival for *NCAPD2* expression and clinicopathological characteristics in liver cancer.

Characteristic	Uni-cox analysis		Multi-cox analysis	
	Hazard ratio (95% CI)	P-value	Hazard ratio (95% CI)	P-value
NCAPD2 expression	1.46 (1.23,1.74)	$1x10^{-5}$	1.48 (1.21,1.83)	0.0002
Age	1.02 (0.998,1.03)	0.08		
Sex	0.82 (0.57,1.16)	0.26		
Pathological T stage	1.68 (1.40,2.01)	<0.0001		
Pathological N stage	2.00 (0.49,8.18)	0.33		
Pathological TNM stage	1.38 (1.15,1.65)	0.00066	1.13 (0.43,3.00)	0.80

Multi-cox; multivariate Cox; *NCAPD2*, non-SMC condensin I complex subunit D2; uni-cox, univariate Cox.