Supplemental Table S1. LncRNAs associated with hepatocellular carcinoma

LncRNAs	Dereg ulation	Bio-functions in HCC	Molecule mechanisms	Referen ces
AF119895	↑	facilitates cellular motility and invasiveness	miR-6508-3p/NXF3 signaling	[134]
AFAP1-AS1	↑	reduces cell proliferation, migration and invasion while increases apoptosis	—	[135]
		promotes invasiveness and G1→S transition, blocks apoptosis	upregulating RhoA-Rac2 signaling	[136]
BANCR	↑	lowers cellular propagation and aggressivity, while accelerates cellular apoptosis	elevating the protein level of VIM, and lowering the protein content of E-cad	[59]
ANRIL	↑	restrains proliferation and metastasis	miR-122-5p expression	[137]
CASC2	↓	inhibits motility and invasiveness	miR-362-5p/NF-κB axis	[138]
CCAT2	↑	accelerates cellular motility and propagation, and suppresses cell apoptosis	—	[139]
		accelerates disease progression,	induction of EMT by Slug	[54]
CCHE1	↑	inhibits cell growth arrest and cell apoptosis	activation of ERK/MAPK signaling	[42]
Cox-2	—	blocks immune evasion and metastasis	macrophage polarization	[140]
CPS1-IT1	↓	reduces cellular propagation, migration and metastasis	regulating HIF-1α activity and inhibiting EMT	[36]
CRNDE	↑	accelerates cellular propagation, motility and invasiveness	CRNDE-miR-384-NF-κB/p-AKT	[120]
DANCR	↑	increases stemness performances	DANCR-miR-214/-320a/-199a-CTNNB1	[141]
EGFR-AS1	—	promotes HCC development	a target of GHR, increasing the expression of EGFR	[60]
FTX	↓	inhibits proliferation and metastasis	binding MCM2 and miR-374a	[38]
	↑	promotes HCC development	modulating miR-545-RIG-I via activation of PI3K-Akt pathway	[69]
FUNDC2P4	↓	enhances EMT process,	decreasing E-cad expression	[142]
GAS5	↓	suppresses the motility and invasiveness	modulating miR-21	[143]
		blocks the propagation and invasiveness, while promotes cell apoptosis	regulating vimentin	[130]
GIHCG	↑	promotes HCC progression	upregulating epigenetically H3K27me3 and DNA methylation levels on the miR-200b/a/429	[51]

			promoter, and epigenetically silencing miR-200b/a/429 expression	
GPC3-AS1	↑	promotes HCC progression	activating epigenetically GPC3	[144]
HNF1A-AS1	↑	as an oncogene in neoplasm multiplication and apoptosis	HNF1A-AS1-hsa-miR-30b-5p-ATG 5; functioning as autophagy promoter	[76]
		promotes HCC cell proliferation	repressing the NKD1 and p21 expression via interacting with EZH2	[57]
HOTAIR	↑	promotes cell proliferation, invasion and progression of tumor xenografts	regulating negatively miRNA-1 and is activated by FOXC1, activating autophagy by upregulating ATG3 and ATG7, partial via the modulation of the Wnt/β-catenin pathway	[29-31]
HOXA-AS2	↑	promotes cellular propagation and represses apoptosis	—	[41]
HOST2	↑	accelerate cellular multiplication, motility and invasiveness, while inhibit apoptosis	—	[40]
HOTTIP	—	—	directly regulating HOXA13	[145]
HULC	↑	enhances hepatocarcinogenesis	modulating the phosphorylation of YB-1 through serving as a scaffold of ERK and YB-1	[146]
		promotes tumorigenesis and metastasis of HCC via enhancing EMT,	modulating the miR-200a-3p/ZEB1 signaling pathway	[147]
		facilitates cancer stem cells (CTCs) propagation	cooperating with lncRNA MALAT1 and guiding RNA pol2, P300, CREPT to bind to the promoter area of TRF2	[71]
		attenuates the sensitivity of HCC cells to chemotherapeutic agents,	triggering autophagy through USP22/Sirt1 signaling	[75]
		promotes neoplasm angiogenesis	miR-107-E2F1-SPHK1 signaling	[148]
Linc-cdh4-2 (TCONS_00027978)	↓	decreases the migration and invasion abilities	increasing the protein levels of R-cadherin and decreasing the protein levels of small GTPase RAC1	[149]
Linc00052	—	strengthens cellular invasion and migration	Linc00052-miR-128/-485-3p-NTRK 3	[33]
Linc01225	↑	promotes onset and aggressivity	EGFR-dependent signaling	[35]
Linc00441	↑	promotes HCC tumorigenesis	H3K27 modification	[53]
lncRNA-NEF	↓	antagonizes epithelial to mesenchymal transition and	FOXA2 and Wnt/β-catenin pathway.	[151]

		cancer metastasis		
lincRNA-p21	↓	inhibits aggressivity,	Notch pathway induced-EMT	[45
Lnc-DILC	↓	relates to intrahepatic inflammation	the cross-linking of TNF-α/NF-κB pathway with IL-6/STAT3 cascade	[79]
lncBRM	↑	maintains liver CSCs and tumor initiation	initiate YAP1 signaling activation	[151]
lncCAMTA1	↑	accelerates cellular multiplication, CSC-like properties, and oncogenesis	inhibiting CAMTA1	[152]
lncRNA-AK058003	↓	Is related to the recurrence and motility of neoplasms,	as a precursor of miR-15a, interacting with HuR to suppress γ-synuclein level	[44]
		suppresses cellular multiplication and metastasis		
lncSox4	↑	promotes neoplasm initiation,	Stat3-mediated Sox4 expression	[153]
MALAT1	↑	serves as a oncogene	modulating carcinogenic alternative splicing via increase of SRSF1 level	[154]
			Sponging miR-143-3p	[155]
		promotes CSCs proliferation,	cooperating with lncRNA HULC	[71]
		regulates multi-drug resistance	regulating autophagy by HIF-2α-MALAT1-miR-216b axis	[49]
		enhances arsenite-induced glycolysis	through HIF-1α stabilization	[81]
MEG3	↓	suppresses cellular multiplication while promotes apoptosis	activating ER stress and p53 signaling and relating to NF‑κB pathway	[78]
NEAT1	↑	accelerates cellular multiplication and invasiveness	regulating hnRNP A2 level	[58]
PCAT-1	↑	increases cell proliferation and migration, and inhibits apoptosis	—	[136]
plncRNA-1	↑	promotes metastasis and induced EMT	regulating EMT signaling	[156]
RP11-134G8.8, RP11-363E7.4 and RP1-193H18.2	—	dedicates to treatment of cisplatin	annotating into the p53 signaling pathway	[157]
SchLAH (also called BC035072)	↓	inhibits the migration and lung metastasis of HCC cells	interacting with FUS	[158]
SNHG1	↑	exacerbates cellular multiplication, motility and invasiveness,	suppressing miR-195	[159]
		exacerbates cellular multiplication, cell cycle, and suppresses apoptosis	suppressing p53 and p53-target genes level	[160]
SNHG12	↑	promotes tumorigenesis and metastasis	SNHG12-miR-199a/b-5p-MLK3/NF-κB signaling	[67]
SNHG20	↑	promotes cell proliferation, invasion and EMT in vitro	binding to EZH2 and modulate E-cad level	[161]

SNHG6-003	↑	promotes cell proliferation and induces drug resistance in vitro	sponging miR-26a/b to regulate TAK1 level	[162]
SPRY4-IT1	↑	facilitates cell proliferation, invasion and EMT in vitro	Interacting with the EZH2 and epigenetically inhibiting E-cad level	[163]
T-UCR uc.158	—	promotes hepatobiliary carcinogenesis	as a potential downstream driver of the Wnt/β-catenin signaling	[164]
TUC338	—	concerns to development of HCC and sorafenib resistance	targeting RASAL1	[48]
TUG1	↑	increases cellular multiplication, motility, propagation and angiogenesis	TUG1-miR-34a-5p-VEGFA signaling	[165]
TUSC7	↓	suppresses cellular invasiveness, aggressivity and EMT	TUSC7-miR-10a-EphA4 signaling	[166]
UCA1	—	exacerbates cellular propagation and oncogenesis	recruiting EZH2 as well as repress p27Kip1/CDK2 pathway	[167]
	↑	exacerbates HCC progression	UCA1-miR-203-Snail2	[68]
uc.338	↑	exacerbates cellular propagation	relating to BMI1 and modulating CDKN1A transcription	[56]
UC001kfo	↑	promotes the metastasis and EMT	targeting α-SMA	[133]
		promotes the proliferation	targeting α-SMA	[133]
Unigene56159	↑	exacerbates cellular motility/invasiveness and EMT	Unigene56159-miR-140-5p- Slug	[168]
XIST	↑	inhibits propagation and metastasis	XIST-miR-92b-Smad7 pathway	[37]
		accelerates G1/S transition while suppresses cellular apoptosis	modulating miR-139-5p-PDK1-AKT signaling	[39]
ZEB1-AS1	↑	promotes tumor growth and metastasis	regulating positively the ZEB1 expression	[34]
ZEB2-AS1	↑	increases neoplasm growth and metastasis	—	[169]
ZNFX1-AS1	↓	suppresses cellular propagation while promotes apoptosis	modulating miR-9 methylation	[52]

—, there is no corresponding data presented.