

The role and mechanism of noncoding RNAs in regulation of metabolic reprogramming in hepatocellular carcinoma

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Supplementary tables

Table 1: ncRNAs dysregulated in HCC.

NcRNA category	NcRNA name	Expression	Function	Ref
miRNA	miR-155	up	Promotes proliferation, inhibits apoptosis	1
	miR-106b	up	Promotes proliferation, inhibits apoptosis	2
	miR-125a	down	Suppresses proliferation	3
	miR-125b	up	Promotes proliferation	4
	miR-26a	down	Suppresses angiogenesis	5
	miR-504	up	Promotes proliferation	6
	miR-1207-5p	down	Inhibits growth and invasion	7
	miR-449	down	Suppresses proliferation	8
	miR-384	up	Promotes proliferation, metastasis	9
	miR-21	up	Promotes proliferation	10
	miR-221	up	Promotes proliferation	11
	miR-222	up	Promotes proliferation, metastasis	12
	miR-122	down	Promotes migration	13
	miR-139	down	Suppresses migration	14
	miR-17	down	Suppresses migration, invasion	15
	miR-375	down	Inhibits proliferation, invasion	16
	miR-28-5p	down	Inhibits metastasis	17
	miR-124	down	Suppresses migration	18
	miR-199a-5p	down	Suppresses invasion	19
	miR-200	down	Inhibits migration	20
	miR-96	up	Promotes proliferation	21
	miR-182	up	Promotes proliferation	
miR-151	up	Promotes invasion, metastasis	22	
lncRNA	HULC	up	Promotes proliferation, metastasis	23
	linc01138	up	Promotes proliferation, invasion	24
	linc00462	down	Promotes proliferation	25
	H19	down	Inhibits proliferation, metastasis	26-27
	linc01419	up	Promotes proliferation	28
	lncUCA1	up	Promotes proliferation	29
	lncPANDA	up	Promotes proliferation	30
	lncHOTAIR	up	Promotes metastasis	31-34
	lncMALAT1	up	Promotes proliferation, invasion, metastasis	
	lncMVIH	up	Promotes metastasis	
	lncMEG3	down	Inhibits proliferation	
	lncATB	up	Promotes metastasis	35
	lncMIAT	up	Promotes proliferation, invasion	36

	lncPDPK2P	up	Promotes progression	37
	MCM3APas1	up	Promotes growth	38
	CDKN2BAS	up	Promotes metastasis	39
	HOXD-AS1	up	Promotes metastasis	40
	lncRNA AY	up	Promotes metastasis	41
	lncELF209	down	Inhibits progression	42
	lncPCNAP1	up	Enhances growth	43
	lncID2-AS1	down	Suppresses metastasis	44
	lncNBR2	down	Inhibits tumorigenesis	45
	linc00662	up	Promotes progression	46
	lnc01093	down	Suppresses progression	47
	lncUCID	up	Promotes growth	48
	lncCSMD1-1	up	Promotes progression	49
	linc01146	down	Inhibits tumorigenesis	50
	lncCYTOR	up	Promotes proliferation	51
circRNA	circ000839	up	Promotes invasion, migration	52
	circ0016788	up	Promotes invasion, proliferation	53
	circ0067934	up	Promotes migration and proliferation	54
	circ0000673	up	Promotes invasion, proliferation	55
	circHIPK3	up	Promotes migration and proliferation	56
	circCUL2	up	Promotes proliferation, migration	57
	circLRIG3	up	Facilitates progression	58
	circRHOT1	up	Promotes growth and metastasis	59
	SMARCA5	down	Inhibits growth and metastasis	60
	circCDR	up	Promotes growth	61
	circZEB1.33	up	Promotes proliferation	62
	circSETD3	down	Inhibits growth	63
	circMTO1	down	Inhibits progression	64
	circFBLIM1	up	Promotes proliferation	65
	circSMAD2	up	Promotes proliferation	66
	circ5692	down	Inhibits progression	67
	circ100338	up	Promotes metastasis	68
	circ104348	up	Promotes progression	69
	circ104718	up	Promotes progression	70
	circ0001955	up	Promotes, proliferation, migration	71-72
	circASAP1	up	Promotes metastasis	73
	circ103809	up	Promoted development	74
	circ0051443	down	Suppresses progression	75
circMMP2	up	Promotes metastasis	76	
TRIM33-12	down	Suppress progression	77	
circ001306	up	Enhances growth	78	

	circSOD2	up	Promotes progression	79
	circMRPS35	up	Promotes progression	80
	circKCNN2	down	Suppresses progression	81
piRNA	piR-Hep1	up	Promotes growth, progression	82
snoRNA	snoRD113-1	down	Suppresses growth	83
	snoRD126	up	Promotes growth	84

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Table 2: miRNAs, circRNAs, etc. regulate HCC metabolic reprogramming.

NcRNA category	NcRNA name	Targets	Ref
miRNA	miR-122	PKM2, G6PD, CAT1	1-3
	miR-7	PI3K/Akt/mTOR	4
	miR-125a	HK2, PI3K/Akt/mTOR	5-6
	miR-202	HK2	7
	miR-33b	G6PC, PCK1	8
	miR-34a	HK2, PDK1, LDHA	9-10
	miR-520	PFK	11
	miR-326	PKM2	12
	miR-133	PKM2	13
	miR-143	HK2	14
	miR-155	HK2	15
	miR-223	GLUT4	16
	miR-376b	ATG4C, BECN1	17
	miR-195-5p	GLUT3	18
	miR-22	GLUT1	19
	miR-1291	GLUT1	20
	miR-340	GLUT1	21
	miR-205	ACSL1	22
	miR-199a	HK2, PKM2	23-24
	let-7	PDK1, LDHA	25-26
	miR-1207-5p	FASN	27
	miR-449	SIRT1, SREBP-1	28
	miR-342-3p	IGF-1R	29
	miR-130b	PTEN	30
	miR-181a	ATG5	31
	miR-885-5p	HK2	32
	miR-455-3p	AMPK	33
	miR-139-5p	PKM2	34
	miR-491-5p	PKM2	35
	miR-142-3p	LDHA	36
	miR-383	LDHA	37
	miR-100-5p	LDHA	38
	miR-455-5p	IGF-1R	39
	miR-125b	p53	40
miR-504	p53	41	
miR-1228	p53	42	
	circMAT2B	PKM2	43

circRNA	circSPECC1	TGF- β 2	44
	circC3P1	PCK1	45
	circRPN2	ENO1	46
snoRNA	snoRD113-1	ERK1,ERK2	47
	snoRD126	PI3K/AKT pathway	48
piRNA	piR-Hep1	AKT	49

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Table 3: lncRNAs regulate HCC metabolic reprogramming.

NcRNA category	NcRNA name	Targets	Ref
lncRNA	lncCUDR	p53	1
	lncHOTAIR	mTOR pathway, GLUT1	2
	lncHOTTIP	GLS1	3
	lncHULC	ACSL1	4
	linc01554	PKM2, AKT/mTOR	5
	lncRNA-p21	GLUT1, LDHA	6
	lncMVIH	PGK1	7
	lncMALAT1	mTOR pathway, CF7L2	8
	lncSLC2A1-AS1	GLUT1	9
	lncWFDC21P	PFKP, PKM2	10
	lincRoR	HIF-1 α , PDK1	11
	lncRAET1K	LDHA	12
	linc00958	HDGF	13
	lncRP11-241J12.3	PC	14
linc00326	CCT3	15	

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