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Role of regulatory non-coding RNAs on Wnt/ β -catenin signaling pathway in tumorigenesis of urinary tract cancers

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• Introduction

Urinary tract cancers

can be located in

kidney

bladder

prostate

urethra

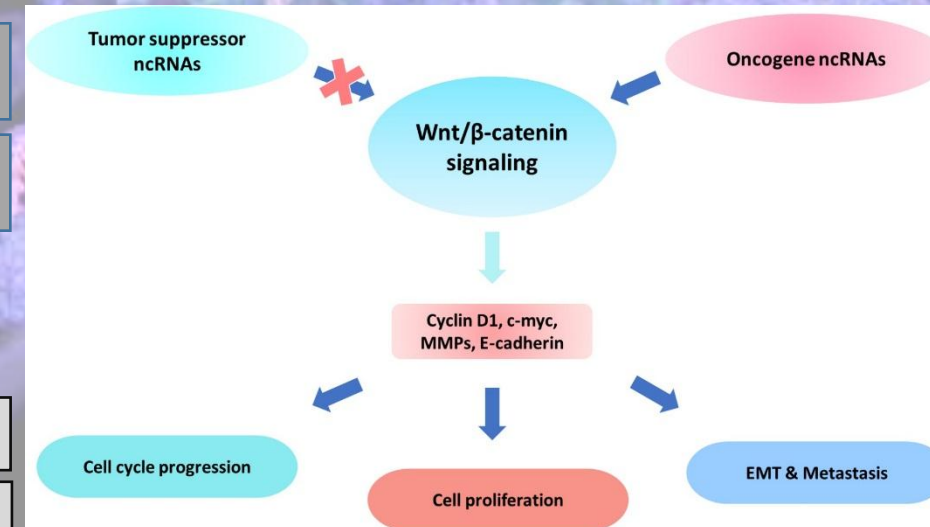
Non-coding RNAs

as important
regulators in

tumorigenesis

metastasis

drug resistance



It has been shown that ncRNAs accelerate tumor growth and progression by regulating various signaling pathways including Wnt/β-catenin.

• Material & Method





• Results

LncRNAs and miRNAs play crucial roles in UT cancer migration, invasion, and metastasis by regulating the expression of various genes and proteins at transcriptional and post-transcriptional levels.

LncRNA	Chromosome	Cancer	Mechanism	Function
LUCAT1	5q14.3	RCC	Inducing β -catenin and cyclin D1 and inhibiting GSK- β	Cell proliferation and invasion
CRNDE	16q12.2	RCC	Inhibiting GSK- β	Cell proliferation and metastasis
LETM1	4p16.3	RCC	Inducing c-myc, cyclin D1, and β -catenin	
CCAT2	8q24.21	Bladder		
		RCC		
HIF1A-AS2	14q23.2	Prostate		
		RCC	Sponging miR-30a-5p and stimulating SOX4, c-myc, cyclin D1, and VEGF	Tumor growth and metastasis
BCAR4	16p13.13	Bladder	Sponging miR-370-3p and inducing β -catenin	Cell proliferation
LINC01614	2q35	Bladder	Sponging miR-217 and inducing β -catenin and c-myc	Tumor growth and proliferation
XIST	Xq13.2	Bladder	Sponging miR-139-5p and inducing Wnt1, β -catenin and c-myc	Tumor growth and metastasis
NEAT1	11q13.1	Bladder	Sponging miR-214-3p and activating Wnt signaling	Chemoresistance
			Activating Wnt signaling	
CDKN2B-AS	9p21.3	Bladder	Activating Wnt signaling and modulating EMT-related proteins	EMT and metastasis
DLX6-AS1	7q21.3			
LINC00152	2p11.2			
LSINCT5	5p15.33			
CARLO-7	8q24.21			
BLACAT1	1q32.1	Prostate	Sponging miR-29a-3p and inducing DVL3	Tumor growth and proliferation
LINC00115	1p36.33	Prostate	Sponging miR-212-5p and inducing FZD5	Tumor growth and metastasis
NORAD	20q11.23	Prostate	Sponging miR-30a-5p and modulating EMT-related proteins	Cell proliferation, EMT, and metastasis
SNHG7	9q34.3	Prostate	Sponging miR-324-3p and modulating EMT-related proteins	Tumor growth, EMT, and metastasis
SOX2-OT	3q26.33	Prostate	Sponging miR-452-5p and modulating EMT-related proteins	

Oncogenic
lncRNAs

LncRNA	Chromosome	Cancer	Mechanism	Function
LINC01510	7q31.2	RCC	Inhibiting β -catenin, MMP2, MMP7, and MMP9	Inhibiting tumor growth and metastasis
NBAT1	6p22.3	RCC	Targeting miR-346 and inducing GSK3 β	Inhibiting cell proliferation and metastasis
LINC01939	2p25.3	RCC	Downregulation of miR-154 cyclin D1, MMP2, and MMP9	Inhibiting tumor growth and metastasis
OTUD6B-AS1	8q21.3	RCC	Regulating E-cadherin, N-cadherin, and Snail	Inhibiting tumor cell migration and invasion
miR143HG	5q32	Bladder	Targeting miR-1275 to up-regulate AXIN2	Inhibiting cell cycle progression and tumor cell proliferation
CASC2	10q26.11	Bladder	Inactivating Wnt pathway	Inhibiting cell proliferation and metastasis

Tumor
suppressive
ncRNAs

• Conclusion

Considering the complex interplay between lncRNAs and miRNAs in UT cancers, it has been suggested that downregulation of oncogenic, or restoration of tumor suppressor ncRNAs may repress the malignant features of UT cancers.

Keywords

ncRNA

Wnt/ β -catenin

Urinary tract cancer

