



Non-coding RNAs as non-invasive diagnostic biomarkers for lung cancer

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Abstract

Lung cancer stands as the second most prevalent cause of cancer-related mortality worldwide and is mainly influenced by delayed diagnosis, even with available therapeutic alternatives. The most recent studies indicate that non-coding RNAs (ncRNAs) are involved with maintaining homeostasis in cells, particularly in gene expression regulation. Hence dysregulation of these ncRNAs may develop

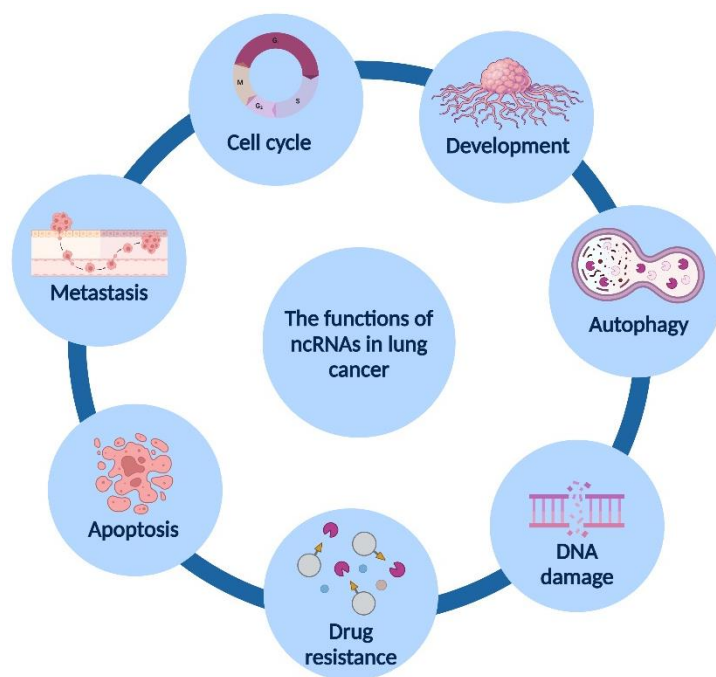


Figure 1. ncRNAs act as oncogenes or tumor suppressors by altering the biological processes of lung cancer. Created with biorender.com

2. Evidence acquisition

The Pubmed database was searched using the keywords: “lung cancer”, lncRNA, miRNA, circRNA, biomarker, non-invasive, and blood/serum/plasma/exosome/urine/saliva to select the related research studies from 2020 to 2023.

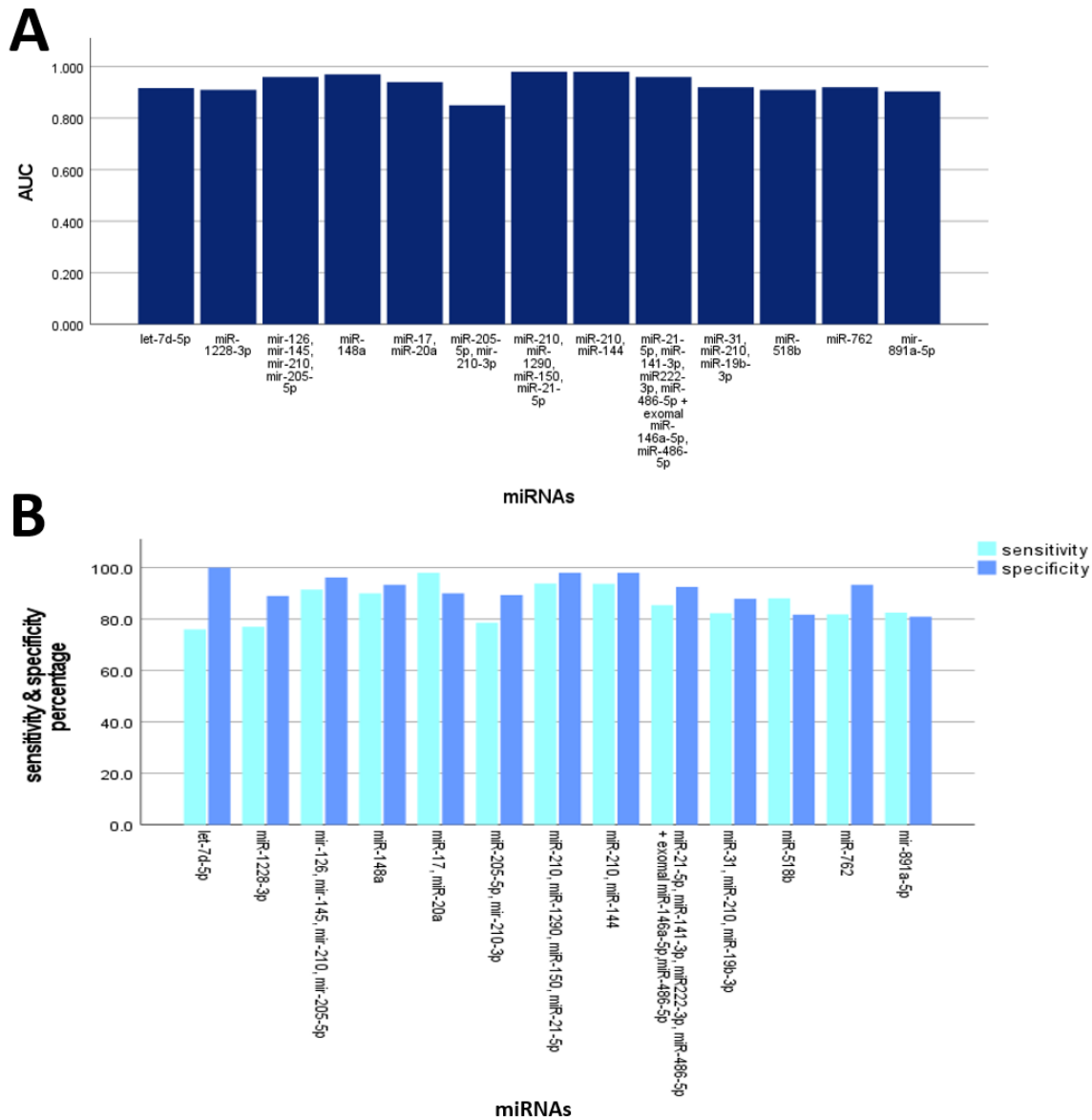
3. Results

3.1. LncRNAs

LncRNAs are considered to be the largest molecule in subclasses of RNAs with a range of 200bp to 100kbp length (21). The engagement of lncRNAs in regulating gene expressions (22), modulating cell cycle, growth (23), cell migration, and invasion (24), correlates with their presence in cancers by their dysregulation from initiation stage

Table 1. Novel lncRNAs as diagnosis biomarkers in lung cancer

LncRNAs	Subtype of cancer	Sample	Expression level	Method	Findings	Year	Reference
LINC00460	NSCLC	Plasma	Up	qRT-PCR	Correlated with osimertinib resistance In EGFR-Mutated Cells, an AUC value Of 0.722	2023	(34)
LINC02159	NSCLC	Serum	Up	RNA FISH	Involves In apoptosis and cell cycle arrest, and ALYREF/YAP1 signaling	2023	(35)
THRIL	LC	Serum	Up	qRT-PCR	Correlated with the expression of IGF1R By sponging Mir-99a, AUC=0.912, Sensitivity = 87.34%, Specificity = 83.78%	2023	(36)
nc-MLETA1	NSCLC	Plasma Exosome	Up	qRT-PCR	Related to the expression of EGFR By sponging Mir-186-5p leading to cell migration and Invasion	2023	(37)
MFI2-AS1	NSCLC	Plasma Exosome	Up	qRT-			



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