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Promising roles of non-exosomal and exosomal non-coding RNAs in the regulatory mechanism and as diagnostic biomarkers in myocardial infarction

Key words: Exosome, Non-exosomal ncRNA, Exosomal ncRNA, lncRNA, miRNA, circRNA, Myocardial Infarction

Research Summary

This review focuses on the regulatory role of exosomal ncRNAs and non-exosomal ncRNAs in myocardial infarction: including lncRNAs, miRNAs and circRNAs.

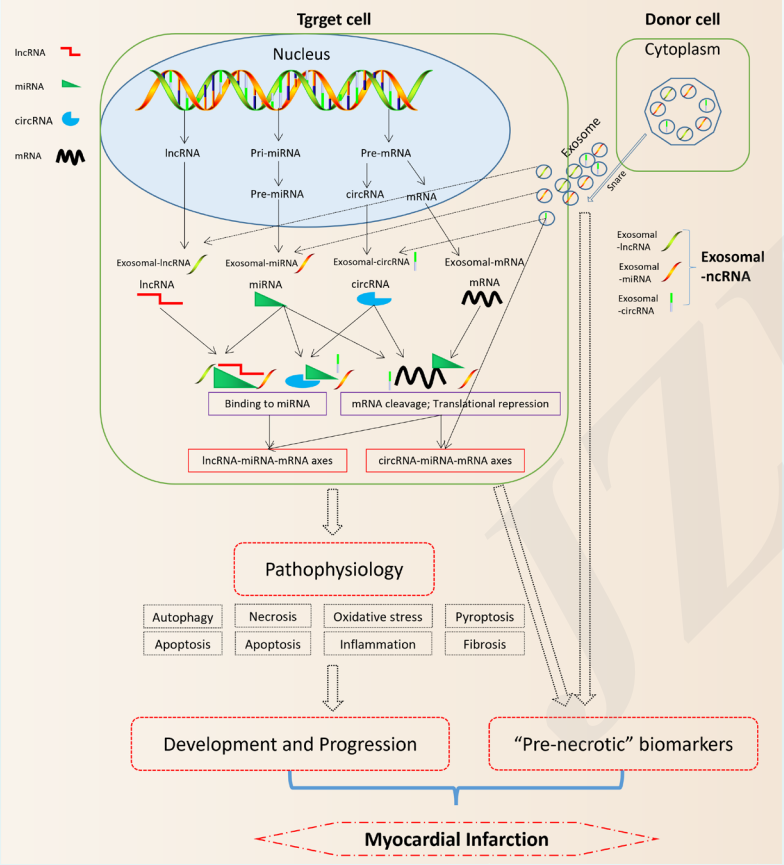


Fig. 1 Non-exosomal ncRNAs and exosomal ncRNAs regulate the pathological process of MI.

- ncRNAs are abundantly regulated at the transcriptional and post-transcriptional levels of genes
- ncRNAs are capable of regulating the progression of multiple diseases
- Different sources of ncRNAs can significantly improve myocardial infarction progression

Innovation points

- **Introduced** the regulatory mechanisms of ncRNAs (including lncRNA, miRNA and circRNA) and their various sources.

- **Summarized** the regulatory roles and ceRNA mechanisms of non-exosomal ncRNAs and exosomal ncRNAs in the progression of myocardial infarction.

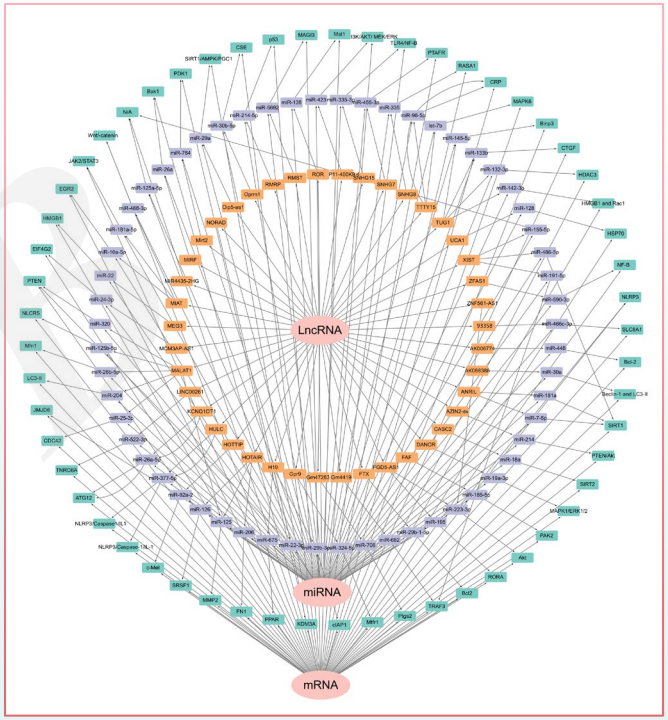


Fig. 2 The ceRNA network of lncRNA.

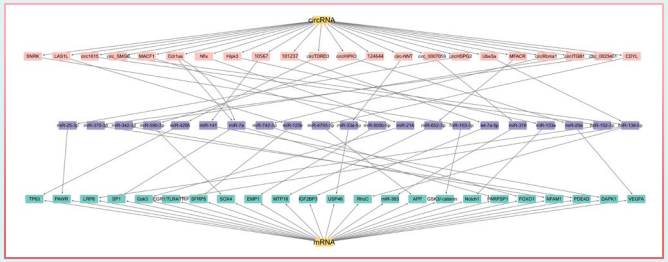


Fig. 3 The ceRNA network of circRNA.

Innovation points

- **Highlights** the role of ncRNAs as effective biomarkers in the diagnosis of MI.

Table 1. The potential biomarker roles of serum non-exosomal ncRNAs in myocardial infarction..

Type	Name	Expression	Disease/number	Function	Ref
miRNA	miR-23a	Low	Human	Diagnostic	(Li et al., 2018)
miRNA	miR-21	High	Human	Diagnostic	(Wang et al., 2017b)
miRNA	miR-143	Low	Human	Diagnostic	(Geng et al., 2020)
miRNA	miR-214	High	Human	Diagnostic	(Yin et al., 2019)
miRNA	miR-152-5p	Low	Human	Diagnostic	(Chen et al., 2022)
miRNA	miR-3681-5p				
miRNA	miR-203	High	Human	Diagnostic	(Li et al., 2022)
miRNA	miR-21-5p	High	Human	Diagnostic	(Mi et al., 2022)
miRNA	miR-126				
miRNA	miR-223-3p	High	Human	Diagnostic	(Scărlătescu et al., 2022)
miRNA	miR-142-3p				
miRNA	miR-146a-5p				

*The completed form can be found in the body of the manuscript **Table 2**.*

Innovation points

- **The origin of exosomal ncRNAs and their regulatory mechanisms in MI.**

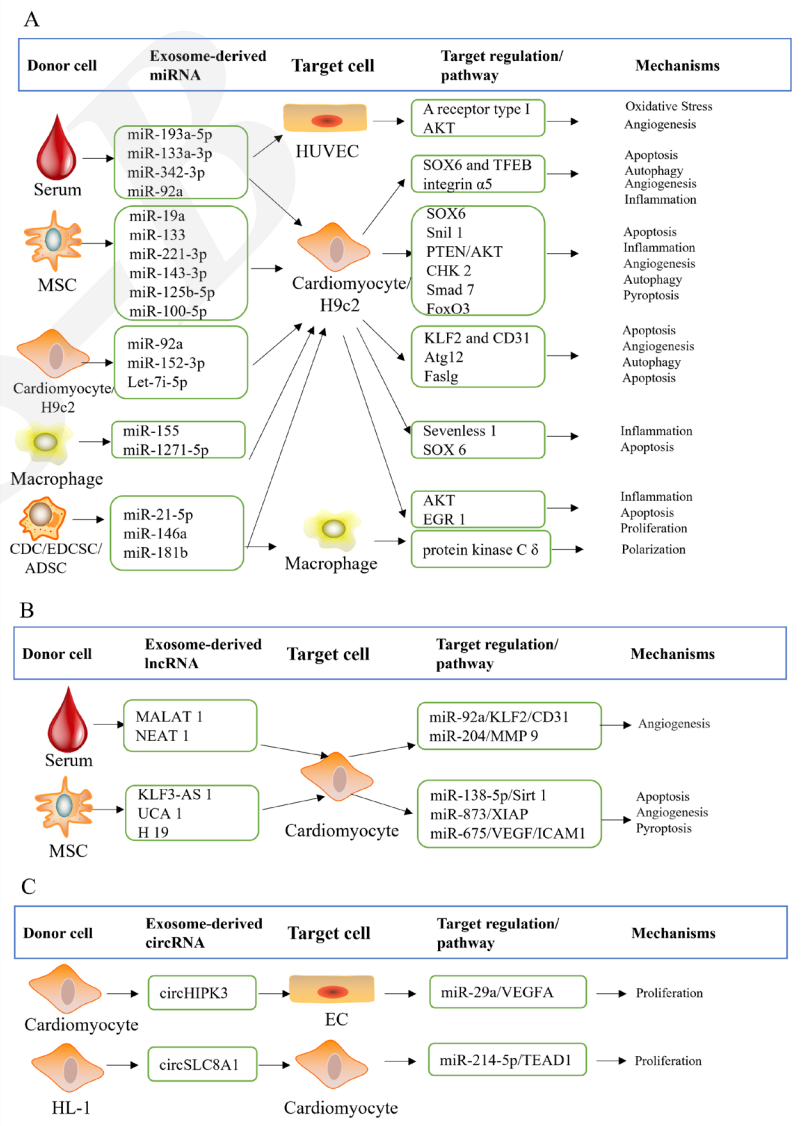


Fig. 4 The role of partial exosomal ncRNA in preclinical studies of myocardial infarction.

Innovation points

A series of comprehensive tables are summarised to present the latest mechanisms regarding ncRNA in MI.

Table S1 | Findings of miRNAs in myocardial infarction.

Table S2 | Findings of lncRNAs in myocardial infarction.

Table S3 | Findings of circRNAs in myocardial infarction.

Table S4 | Findings of lncRNA-miRNA-mRNA axes in myocardial infarction.

Table S5 | Findings of circRNA-miRNA-mRNA axes in myocardial infarction.

Table S8 | Findings of exosomal-derived ncRNAs in myocardial infarction.

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