

Exosomal microRNAs in the development of essential hypertension and its potential as biomarkers

ABSTRACT

MicroRNAs (miRNAs) are small regulatory molecules that are involved in posttranscriptional modifications. These noncoding RNAs are usually ferried by extracellular carriers such as exosomes or other protein and lipid carriers inside a range of body fluids including plasma and urine. Due to their ability to withstand harsh external conditions, exosomal miRNAs possess enormous potential as noninvasive disease biomarkers for, notably hypertension, whereby exosomal miRNAs have been implicated in its pathophysiological processes. More importantly, alterations in the microenvironment as a result of disease progression can induce active and selective loading of miRNAs into exosomes. In this paper, we first review the mechanisms of miRNA loading into exosomes, followed by the roles of exosomal miRNAs in the development of hypertension, and the potentials of exosomal miRNAs as biomarkers in comparison with other free circulating miRNAs. Finally, challenges and future research surrounding exosomal miRNAs will also be discussed. This review will aid in the understanding of noninvasive biomarkers for the early diagnosis of hypertension and for probing therapeutic efficacy.

Keyword: Clinical biomarker; Extracellular vesicles; High blood pressure; Microvesicles; Small noncoding RNA