

miRNAs and rheumatoid arthritis: new update in expression pattern and pathogenicity

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Rheumatoid arthritis (RA) is a polygenic autoimmune disease characterized by systemic inflammation and disability of joints. Early diagnosis and treatment could prevent diseases in RA patients from becoming severe. miRNAs are small, non-coding RNA that regulate the post-transcriptional level of gene expression. miRNAs play important roles in gene expression and pathogenicity of autoimmune diseases as well as RA. Properly using miRNAs regulation potential and detecting different expression patterns and their functions could facilitate and manage effective therapeutic interventions in RA patients. Herein, we discuss miRNAs as a therapeutic agent in RA patients.

Keywords: Rheumatoid arthritis (RA); MicroRNA (miRNA); Expression, Regulation

Introduction

Rheumatoid arthritis (RA) is a chronic autoimmune disease with systemic inflammation and multiple joint destructions. Like most other autoimmune diseases, RA is seen most frequently in women and older individuals [1, 2]. The synovial joints are the most important tissue in RA patients. Irreversible joint damage is seen in RA joints characterized by leukocyte infiltration and chronic inflammation [3, 4]. Beside immune cells function in RA joint inflammation, rheumatoid arthritis synovial fibroblasts (RASFs) are important cells in RA pathogenesis and are reported to be major effectors in joint inflammation and destruction [5-7].

Multiple factors are included in the RA pathogenicity, including various genes and environmental factors which trigger the autoimmune condition. Epigenetic variations are other important factors involved in RA pathogenicity [8]. Evidence has revealed the importance of miRNAs in gene expression and the development of autoimmune

diseases like RA [9-14]. The association between miRNAs and RA was reported in 2008 when a significantly different expression pattern was observed in patients [15]. Several studies have reported the dysregulation of miRNAs in inflamed joints and peripheral blood of RA patients. The miRNAs have complete stability in body fluids, because this microenvironment has complexes with proteins that prevent degradation [16]. These molecules could be proper candidates for RA monitoring and treatment factors. Herein, we summarize and update the existing data on miRNA expression patterns, their potential validated targets, and pathologic factors in treatment interventions.

miRNAs biogenesis and function

miRNAs are a class of small non-coding RNAs that regulate gene expression by post-transcriptional silencing of target mRNAs. Although in some conditions these molecules can be positive regulators of gene expression, miRNA genes comprise on y

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