

Chapter 9

THE ROLE OF MicroRNAs IN COVID-19 INFECTION

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INTRODUCTION

Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) causes The recent novel coronavirus disease (COVID-19) in the infected hosts. Although it primarily affects the cardiovascular system and immune system, many more systemare inflicted in addition to the respiratory system. The changes caused by miRNAs (MICRORNAS) on COVID-19 disease at the molecular levels are examined. The study give details about interactions among SARS-CoV-2 RNA, viral miRNAs and all coding and non-coding host RNAs by utilizing bioinformatic analysis. Host miRNAs are attracted towards viral genome and this leads to important modifications in the cellular miRNA gene expression. It is recommended that miRNAs diminish the impulse transmission pathway control with in SARS-CoV-2 infection. The entangled clinical disease symptoms can be clarified via the the interaction of viral miRNAs from SARS-CoV-2 with genes contained in transcription regulation and chromatin organization. Comprehending the role of miRNAs in COVID-19 disease pathogenesis will aid to enhance treatment alternatives. Currently studies are performed on extracellular vesicles (extracellular vesicles) being generated from mesenchymal stem cells in which special miRNAs are added to avert excessive cytokine production in COVID-19 disease.

The unique activities of the cell, basic building block of living organisms, are performed by extremely sensitive and interconnected many control mechanisms. The protein synthesis that executes cellular activities depends on the sequential occurrence of a series of molecular reactions. It was understood that many small molecules, besides ribonucleic acid (RNA) and deoxyribonucleic acid (DNA) macromolecules, take part at distant levels in the regulation of transcription and translation with the expanded molecular biology studies. The methylation of DNA

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role in the control of “A disintegrin and metalloproteinase domain 17 (ADAM17)”, an enzyme that plays a role in the activation of TNF- α cytokine and IL-6 receptors. It has been reported that estrogen hormone increases the expression of miR-222 (6). The studies aimed to identify miRNAs that play a role in the antiviral defense mechanism and to use them as a treatment option. Understanding the role of miRNAs in the immune response in COVID-19 disease, identifying miRNA target genes and regulating miRNA activity may contribute to the prevention of the disease and the development of an effective treatment (10).

CONCLUSION

It is aimed to identify miRNAs that play a role in the anti-viral defense mechanism and to use them as a treatment option. Understanding the role of miRNAs in the immune response in COVID-19 disease, identifying miRNA target genes and regulating miRNA activity may contribute to the prevention of the disease and the development of an effective treatment.

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