

## Abstract

MicroRNA (miRNA) are short single-stranded RNAs that do not encode proteins. Their main function is the regulation of the gene expression on the level of translation. This regulation is mediated by the binding of miRNA to the partially complementary segments of mRNA, both cellular or viral. It is estimated that miRNAs affect expression of at least one third of human genes and thereby influence regulation of cellular growth, differentiation and apoptosis of cells. Recently the miRNAs encoded mainly by DNA viruses were discovered. These miRNAs enhance the persistence of viral infection in the host and can contribute to malignant transformation. However, the oncogenesis is also significantly affected by the regulation of cellular miRNAs expression by viral proteins.

The miRNA research is topical. MiRNAs are considered as potential biomarkers and their utilization as a cancer therapy is being intensely explored.

In this thesis, I'm describing the biogenesis and regulatory functions of miRNAs. I'm also presenting an overview of viral miRNAs focusing on human oncogenic viruses which do not only code their own miRNAs but also influence the expression of the host miRNAs. Finally, I am focusing on current clinical applications of miRNA.

**Key words:** viral miRNA, cellular miRNA, oncogenesis, viral infections, malignant transformation, gene expression