

## **Abstract**

microRNAs (miRNAs) represent a relatively newly discovered group of RNA molecules and they serve to regulate gene expression. In spite of processes of differentiation, proliferation and apoptosis, miRNAs influence the whole biological systems, such as embryogenesis, oncogenesis, and immunity. There have been a number of experiments in recent years concerning diagnoses and predictions of complications during pregnancy, and tumour growth. Extracellular miRNA molecules participating in circulation of patients are used in the non-invasive diagnostics. RNA molecules usually get into the extracellular fluid during the apoptosis process.

I chose four diseases, which extracellular miRNA have diagnostic potential – preeclampsia, intrauterine growth retardation, gestational diabetes mellitus and breast cancer – for my work. An aberrant expression of different levels of various extracellular miRNAs has been reported in these diseases but the clinical use of microRNAs in the diagnosis and prediction of those still requires further research and optimization.

### **Keywords:**

breast cancer, extracellular nucleic acids, fetal growth retardation, gestational diabetes mellitus, microRNA, PCR, preeclampsia