

Abstract

Introduction: Colorectal cancer (CRC) is the most common malignant tumor in both sexes in the Czech Republic. Prognostic factors in CRC can be classified as clinical (stage at the time of diagnosis, histological type of tumor), genetic (RAS, BRAF), immunological (Immunoscore) and biochemical (CEA, CA 19-9, miRNA). MicroRNAs (miRNAs) regulate the expression of oncogenes and tumor suppressors. The regulatory function of miRNAs is influenced by single nucleotide polymorphisms (SNPs) of target miRNA binding sites (miRSNPs).

Aims: To evaluate the currently available prognostic factors for CRC patients treated using targeted therapies and assess the role of novel ones, including miRNA.

Methods: The thesis includes clinical works focused on targeted treatment of colorectal cancer, original work focused on the role of miRNA in colorectal cancer pathogenesis and especially as a prognostic and predictive marker, work focused on functional polymorphisms of DNA repair genes and a review article summarizing biochemical factors influencing the effect of fluoropyrimidine cytostatics in the treatment of colorectal cancer.

Results: We have identified miR-17/92 as a non-invasive biomarker for predicting post-treatment prognosis in patients with a higher risk of relapse, as well as miRSNPs rs8679 polymorphisms as a predictor of CRC risk and patient survival. Polymorphisms in DNA repair genes (REV3L, POLQ and NEIL3) were identified as predictive factors for patient survival.

Conclusion: MiRNAs are promising prognostic biomarkers for CRC and have the potential to be used for the planning of optimal treatment strategies.

Key words: colorectal carcinoma, microRNA, survival markers