MicroRNA-21 as a biomarker and potential therapeutic target in pancreatic ductal adenocarcinoma

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Introduction:
Pancreatic ductal adenocarcinoma (PDAC) has the worst prognosis among all cancers due to late-stage diagnosis, limited detection and treatment methods. MiRNAs are post-transcriptional regulators, recently reported to have numerous functions, including modulation of cellular differentiation, proliferation, and apoptosis. Several tumor suppressors, such as PTEN, TPM1, and PDCD4 were identified as miR-21 targets. MiR-21 is stable in both tissues and plasma, disease-specific and therefore it appears to be a promising biomarker for benign and malignant diseases of pancreas. Current evidence suggests that miR-21 overexpression is associated with shorter overall survival, higher rate of liver and regional lymph nodes metastases.

Aim of study:
The purpose of the study is to review the current literature on the evaluation of miR-21 as a prognostic biomarker in PDAC, as well as influence of miR-21 on pancreatic cancer cells.

Materials and Methods:
Review of English language articles from PubMed addressing the link between miR-21 and PDAC.

Results:
In the analysed articles, increased miR-21 is associated with significant decrease of overall and progression-free survival in patients with PDAC. In addition miR-21 upregulation is linked with poor tumor differentiation and lymph nodes metastasis regardless of sample source, either tissue or circulation samples. The miR-21 has been found to be elevated very early in pancreatic neoplasia. Interestingly, inhibition of miR-21 decreased chemoresistance for gemcitabine of pancreatic cancer cells.

Conclusion:
According to the latest literature, miR-21 contributed to proliferation, invasion, and chemoresistance of pancreatic cancer cells. In conclusion, miR-21 may serve as a useful prognostic biomarker and potential target for pancreatic cancer therapy.

Keywords: biomarker, miRNA, pancreatic cancer, prognosis,