

Tumor-Specific MiRNA Signatures In Combination With CA19-9 For Liquid Biopsy-Based Detection Of Pancreatic Cancer

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Background : Pancreatic ductal adenocarcinoma (PDAC) is considered one of the most aggressive malignancies and has high mortality and poor survival rates. Therefore, there is an urgent need to discover non-invasive biomarkers for early detection before PDAC reaches the incurable stage. We hypothesized that liquid biopsy of PDAC-derived extracellular vesicles (PDEs) containing abundant microRNAs (miRNAs) could be used for early diagnosis of PDAC because they can be selectively enriched and because they are biologically stable.

Methods : We isolated PDEs by immunocapture using magnetic beads, and we identified 13 miRNA candidates in 20 pancreatic cancer patients and 20 normal controls.

Results : We found that expression of five miRNAs, including miR-10b, miR-16, miR155, miR-429, and miR-1290, was markedly higher in PDEs. Furthermore, the miRNA signatures along with serum carbohydrate antigen 19-9 (CA19-9) were optimized by logistic regression, and the miRNA signature and CA19-9 combination markers (CMs) were effective at differentiating PDAC patients from normal controls. As a result, the CMs represented a high sensitivity (AUC, 0.964; sensitivity, 100%; specificity, 80%) and a high specificity (AUC, 0.962; sensitivity, 85.71%; specificity, 100%).

Conclusions : These findings suggest that five miRNAs expressed in PDEs and CA19-9 are valuable biomarkers for screening and diagnosis of pancreatic cancer by liquid biopsy

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