Serous ovarian cancer microRNA profiling

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Background: Ovarian cancer is a deadly disease that often goes undetected until it has reached an advanced stage. Identifying biomarkers that can detect ovarian cancer early is critical for improving patient survival. In this project, we aim to identify microRNA biomarkers for ovarian cancer focusing on the most common type, the serous ovarian cancer, using microarray and qRT-PCR. MicroRNAs are small, non-coding RNA molecules that regulate gene expression and have been shown to be dysregulated in various cancers. Our research has the potential to bring us a step closer to a reliable and early detection method for serous ovarian cancer.

Methods: Our team performed microarray (G3 Human miRNA Microarray Kit) analysis on plasma samples obtained by liquid biopsy from ovarian cancer patients and controls to identify differentially expressed microRNAs. We extracted microRNAs from plasma (miRNeasy Serum/Plasma Kit), and then validated our findings using qRT-PCR (miRCURY LNA miRNA system) on the same set of samples. Our findings showed differently expressed microRNA (miR-4281, miR-3960, miR-1202, miR-6510-5p, miR-6089, miR-6090, miR-7975, miR-4463, miR-4516, and miR-1299) that have been associated with ovarian cancer.

Results: Our research has identified several microRNAs that are significantly dysregulated in ovarian cancer patients compared to healthy controls. Our validation studies using qRT-PCR confirmed that miR-4281, miR-3960, and miR-1202 were significantly upregulated in ovarian cancer patients compared to healthy controls. Furthermore, miR-6510-5p and miR-6089 were significantly downregulated in ovarian cancer patients compared to controls. These findings indicate that these microRNAs have the potential to serve as reliable biomarkers for early detection of ovarian cancer.

Conclusion: The microRNAs, miR-4281, miR-3960, miR-1202, miR-6510-5p, and miR-6089, may serve as potential FIGO stage biomarkers for ovarian cancer, but further validation studies are needed to confirm these findings. Our work is an important step towards developing more accurate and effective methods for detecting ovarian cancer.