

## Title

**Elucidating the role of MicroRNA in Prostate Cancer: Emerging as Novel Diagnostic Biomarkers.**

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## **ABSTRACT** (250-300 words)

**Background:** Prostate cancers are slow-growing and may cause significant harm in the future being more aggressive and may spread to other parts of the body. The false positive errors in the diagnosis and invasive methods of treatment of prostate cancer may lead to serious complications in an individual's life. Therefore, researchers are focused on microRNA. MicroRNAs (miRNAs) are small, non-coding RNA molecules that play a crucial role in the regulation of gene expression. They are involved in various cellular processes, including cell growth, differentiation, and apoptosis. Dysregulation of miRNA expression has been implicated in the development and progression of various diseases, including cancer. The miRNAs have shown promise as diagnostic and prognostic biomarkers for prostate cancer. Detection of specific miRNAs in blood or tissue samples may aid in early diagnosis and provide information about the aggressiveness of the disease.

**Objective:** Our study aims to explore and validate the expression of circulating miRNA in the serum of PCa patients and investigate their diagnostic potential in differentiating PCa from healthy controls.

### **Material and methods**

The tissue and serum samples were collected from BPH and PCa patients and only serum samples from CRPC and healthy control for expression analysis of miRNA. The diagnostic biomarker potential was evaluated using Receiver Operating Characteristics (ROC). Bioinformatic tools were used to explore and analyze miRNA target genes.

### **Results**

Our study shows that miRNA 221 and miRNA 183 were significantly upregulated and miRNA 145, miRNA 1827, miRNA 363, and miRNA 711 were significantly downregulated in both PCa tissue and

serum. They are potentially non-invasive diagnostic biomarkers with significant and greater AUC with higher sensitivity and specificity.

## **Conclusion**

The estimation of cell-free miRNA and its target gene will give a wholesome picture of liquid biopsy for an individual- PCa patient and healthy control, which will help in reducing the pain and suffering of the patient as well as help in developing certain clinical tests that can help in quick and early diagnosis of PCa.

## **BIOGRAPHY** (100-150 words)

My area of research is in molecular and cancer biology. I have attained an important experience in molecular as well as clinical cancer research. I also worked extensively in cancer therapeutics through the mechanistic evaluation of many natural agents against different cancer cell lines. Altogether I have published more than 100 research articles in reputed international journals with a total impact factor of over 200 and citations are more than 2000. Now I am working on microRNA profiling of prostate cancer and OSCC which may be useful as diagnostic and prognostic biomarkers for the prediction of therapy outcomes. *I am currently working as PI on the project entitled “Targeting non-invasive MicroRNAs as novel signature for castration resistance and aggressive prostate cancer: A case-control study”.* The study focuses on a better understanding of miRNA-regulated pathways in prostate cancer can improve our knowledge in pathogenesis of the disease and can potentially aid in developing miRNA-based diagnostic and therapeutic strategies for the management of CRPC and prostate cancer.

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