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Micro-Ribonucleic Acid-21 as High Potential Prostate Cancer Biomarker

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Abstract : Cancer is the leading cause of death worldwide. Cancer is caused by mutations that alter the function of normal human genes and give rise to cancer genes. MicroRNA (miRNA) is a small non-coding RNA that regulates the gen through complementary bond towards mRNA target and cause mRNA degradation. miRNA works by either promoting or suppressing cell proliferation. miRNA level expression in cancer may offer another value of miRNA as a biomarker in cancer diagnostic. miRNA-21 is believed to have a role in carcinogenesis by enhancing proliferation, anti-apoptosis, cell cycle progression and invasion of tumor cells. Hsa-miR-21-5p marker has been identified in Prostate Cancer (PCa) and Benign Prostatic Hyperplasia (BPH) patient's urine. This research planned to explore the diagnostic performance of miR-21 to differentiate PCa and BPH patients. In this study, urine samples were collected from 20 PCa patients and 20 BPH patients. miR-21 relative expression against the reference gene was analyzed and compared between the two. miRNA expression was analyzed using the comparative quantification method to find the fold change. miR-21 validity in identifying PCa patients was performed by quantifying the sensitivity and specificity with the contingency table. miR-21 relative expression against miR-16 in PCa patient and in BPH patient has 12,98 differences in fold change. From a contingency table of Cq expression of miR-21 in identifying PCa patients from BPH patient, Cq miR-21 has 100% sensitivity and 75% specificity. miR-21 relative expression can be used in discriminating PCa from BPH by using a urine sample. Furthermore, the expression of miR-21 has higher sensitivity compared to PSA (Prostate specific antigen), therefore miR-21 has a high potential to be analyzed and developed more.

Keywords : benign prostate hyperplasia, biomarker, miRNA-21, prostate cancer
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