World Academy of Science, Engineering and Technology
International Journal of Medical and Health Sciences
Vol:12, No:08, 2018

Urinary Exosome miR-30c-5p as a Biomarker for Early-Stage Clear Cell Renal Cell Carcinoma

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Abstract : miRNAs derived from exosomes exist in a body fluid such as urine were regarded as potential biomarkers for various human cancers diagnosis and prognosis, as mature miRNAs can be steadily preserved by exosomes. However, its potential value in clear cell renal cell carcinoma (ccRCC) diagnosis and prognosis remains unclear. In the present study, differentially expressed miRNAs from urinal exosomes were identified by next-generation sequencing (NGS) technology. The 16 differentially expressed miRNAs were identified between ccRCC patients and healthy donors. To explore the specific diagnosis biomarker of ccRCC, we validated these urinary exosomes from 70 early-stage renal cancer patients, 30 healthy people and other urinary system cancers, including 30 early-stage prostate cancer patients and 30 early-stage bladder cancer patients by qRT-PCR. The results showed that urinary exosome miR-30c-5p could be stably amplified and meanwhile the expression of miR-30c-5p has no significant difference between other urinary system cancers and healthy control, however, expression level of miR-30c-5p in urinary exosomal of ccRCC patients was lower than healthy people and receiver operation characterization (ROC) curve showed that the area under the curve (AUC) values was 0.8192 (95% confidence interval was 0.7388-0.8996, P= 0.0000). In addition, up-regulating miR-30c-5p expression could inhibit renal cell carcinoma cells growth. Lastly, HSP5A was found as a direct target gene of miR-30c-5p. HSP5A depletion reversed the promoting effect of ccRCC growth casued by miR-30c-5p inhibitor, respectively. In conclusion, this study demonstrated that urinary exosomal miR-30c-5p is readily accessible as diagnosis biomarker of early-stage ccRCC, and miR-30c-5p might modulate the expression of HSPA5, which correlated with the progression of ccRCC.

Keywords : clear cell renal cell carcinoma, exosome, HSP5A, miR-30c-5p
Conference Title : ICU 2018 : International Conference on Urology
Conference Location : Dublin, Ireland
Conference Dates : August 16-17, 2018