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Editorial

Urinary Biomarkers

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Urinary biomarkers offer a non-invasive and easily accessible means of assessing an individual's health and susceptibility to various diseases. Urine biomarkers have the advantage of being non-invasive in nature compared with serum biomarkers. Urine biomarkers can provide critical insights into an individual's predisposition to certain conditions, disease progression, and therapeutic response. Combining urinary and serum biomarkers can offer a more comprehensive approach to disease diagnosis, monitoring, and personalized medicine. Urinary biomarkers hold immense promise in improving patient outcomes and transforming healthcare [1]. New biomarkers are important for an early diagnosis and can have a prominent importance [2]. Urine is a highly desirable biospecimen for biomarker analysis because it can be collected recurrently by non-invasive techniques, in relatively large volumes. Urine contains cellular elements, biochemicals, and proteins derived from glomerular filtration of plasma, renal tubule excretion, and urogenital tract secretions that reflect, at a given time point, an individual's metabolic and pathophysiologic state [3]. The development of more specific biomarkers for prostate cancer and/or high-risk prostate cancer is necessary because the prostate-specific antigen test lacks specificity for the detection of prostate cancer and can lead to unnecessary prostate biopsies. Urine is a promising source for the development of new biomarkers of prostate cancer. Biomarkers derived from prostate cancer cells are released into prostatic fluids and then into urine. Non-invasive urinary markers can help in the decision to carry out prostate biopsy or in the design of a therapeutic strategy [4]. The determination of biomarkers is a significant field of analytical chemistry research under continuous evolution that contributes to enhance diagnostics and enable more personalized medicine [5].

The development of more specific biomarkers for prostate cancer is necessary because the prostate-specific antigen test lacks specificity for the detection of prostate cancer and can lead to unnecessary prostate biopsies. Urine is a promising source for the development of new biomarkers of prostate cancer. Biomarkers derived from prostate cancer cells are released into prostatic fluids and then into urine. Urine after manipulation of the prostate is enriched with prostate cancer biomarkers. Non-invasive urinary markers can help in the decision to carry out prostate biopsy or in the design of a therapeutic strategy [6]. Microfluidics technologies are transforming diagnostic medicine by accurately detecting biomolecules in biological samples. Urine is a promising biological fluid for diagnostics due to its noninvasive collection and wide range of diagnostic biomarkers [7]. The use of urine markers in the detection of bladder cancer have been the subject of research for decades. The idea that urine being in continuous contact with tumor tissue should provide a vector of tumor information remains an attractive concept. Research on this topic has resulted in a complex landscape of many different urine markers with varying degrees of clinical validation. Unfortunately, the number of different urine markers and the efforts in research and development of clinical-grade assays are not reflected in the use of these markers in clinical practice, which is currently limited. Numerous prospective trials are in progress with the aim of increasing the quality of evidence about urinary biomarkers in bladder cancer to achieve guideline implementation. Some efforts are directed towards addressing the limitations of current assays to improve the performance of urine markers for a straightforward detection of bladder cancer. Additionally, comprehensive genetic analyses are emerging based on advances in next-generation sequencing and are expected to substantially affect the potential application of urine markers in bladder cancer [8]. In summary, urine biomarkers have an advantage as they are non-invasive in nature compared with serum biomarkers. The prostate-specific antigen test lacks specificity for the detection of prostate cancer and can lead to unnecessary prostate biopsies. Urine is a promising source for the development of new biomarkers.

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