Editorial

Looking for clues from urinary biomarkers

Volume 9 Issue 1 - 2020

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Received: February 24, 2020 | **Published:** February 27, 2020

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Some reviewers like to ask for if there is any correlation between the discovered potential biomarkers and the disease studied, when a biomarker discovery paper was submitted for publication. Personally I do not think the a useful biomarker is required to also reflect either the mechanism of the disease or the therapeutic target of the disease. As long as the manuscript provides the evidence that there is an association between the potential biomarker and the disease, the manuscript meets the basic requirement to be published. If the relationship with the disease can be established, proved or validated, it is wonderful. Personally I hate to force or being forced, a biomarker laboratory to the field of disease mechanism research.

Actually some manuscripts did provide information related to the disease. In many potential biomarker tables, authors labeled some of the biomarker with references providing evidences, that this particular marker had been reported to associate with the mechanism of the disease or had been reported to be the potential biomarker of the disease before. Some reviewers are not satisfied with those information freely available. They prefer new information generated in authors' own laboratory instead.

If we could reverse the time sequence, the fact that some of the potential biomarkers had been reported to associate with the disease, means that if we did the biomarker studies earlier, we would be able to prove the association in other experiments by other laboratories later. Is that even a better validation?

If some of the potential biomarkers can be validated by other independent experiments in other laboratories, it means that biomarker studies can systematically discover unknown information related to the mechanisms and even potential therapeutic targets of the disease. We may not be able to find potential therapeutic target from differential proteins directly. Instead, we should carefully check for the biological processes and pathways the urinary differential proteins represented. These information especially unreported processes and pathways would provide us the crucial targets which are keys to modulate or to stop them.

The reason that biomarker discovery studies are not commonly used for disease mechanism study and drug target discovery is because that proteome profiling of the blood is difficult to reach to a significant depth due to the suppression by high abundance proteins. For the same proteomics protocol, more urinary proteins can be identified. It gives us better chance to find differential proteins related to disease mechanisms and drug targeting. More importantly, urine can reflect earlier changes during disease development because changes in blood are removed by homeostatic mechanisms of the body especially in early stage of the disease. Finding mechanisms at early stage is crucial for early intervention and prognosis of the disease.

At this point we should also notice that at different stages of the disease biomarker panel can and should be different. At different stages of the disease, the pathogenesis and pathology are different, the biomarkers that reflect them should be different. This has been shown in many different studies in various animal models.

With these ideas in mind, urinary biomarkers provide information not limited to early disease diagnosis but also disease mechanisms discovery and drug target development.

Acknowledgments

This work was supported by National Key Research and Development Program of China (2018YFC0910202, 2016YFC1306300), Beijing Natural Science Foundation (7172076), Beijing cooperative construction project (110651103) Beijing Normal University (11100704) Peking Union Medical College Hospital (2016-2.27).

Conflicts of interest

Author declares that there are no conflicts of interest.