



Letter to the Editor

## Response: Serial blood biomarker measurements for elucidation of the pathophysiology of heart failure



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Dear Dr. Zhang,

We thank you for your comment on our paper [1] concerning the association of the temporal pattern of miR-22-3p with clinical outcome in patients with chronic heart failure.

We agree that further elucidation of the mechanisms underlying this association is warranted. In our investigation, we assessed several miRs, and hypothesized that they affect prognosis. Specifically, by using a longitudinal, repeated measures study design we aimed to describe their associations with prognosis in detail. Although at study baseline, miR-22-3p levels were similar in patients who would later experience adverse events (hospitalization for heart failure, left-ventricular assist device implantation, heart transplantation, cardiac death), and those who would not, levels diverged over time as the adverse event approached. This finding was enabled by the availability of tri-monthly blood samples, which gave us the opportunity to assess temporal patterns of miRs at the individual level, as well as the temporal order of changes in

miR levels and occurrence of the adverse event. This approach has also rendered interesting findings in our recent study of patients with acute heart failure, where repeatedly assessed miR-1306-5p levels were associated with prognosis [2].

While the results of our longitudinal studies contribute to the unraveling of the pathophysiology of heart failure, we concur that the signaling pathways underlying the association of miR-22-3p with clinical outcome warrant further investigation, particularly to open novel therapeutic avenues. The speculation that miR-22-3p plays a role in LnCRNA H19 mediated cardioprotective efficiency during myocardial ischemia-reperfusion injury is an interesting notion. We commend additional studies discerning this signaling pathway and are looking forward to learning from further developments in this field of research.

### Conflict of interest statement

The authors report no relationships that could be construed as a conflict of interest.

### References

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