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Editorial

Editorial for the Special Issue "Biological Markers of Cardiovascular Diseases: Applications and Utility in Clinical Practice"

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Circulating biomarkers are currently under scientific discussion as a potential tool for the diagnosis, prediction and risk stratification of cardiovascular and metabolic diseases. This Special Issue was conceived based on the plausible clinical implementation of the main groups of circulating biomarkers reflecting the most important pathological processes in the natural evolution of numerous cardiovascular and metabolic diseases. It consists of eight articles, including two narrative reviews which cover both the fundamentals and clinical applications of biomarkers as a promising predictive tool in different clinical settings.

Silas E. et al. (2022) [1] used a laboratory animal model to determine the cytokines, chemokines and hematological parameters in male Sprague Dawley (SD) rats with type 2 diabetes mellitus (T2DM) infected with *Trichinella (T) zimbabwensis*. The authors found that *T. zimbabwensis* regulates T2DM-driven inflammation through increases in the concentrations of tumornecrosis factor-alpha (TNF-α), interferon-gamma, interleukin (IL)-4, IL-10, IL-13, CCL5, CXCL10 and CCL11 and mediates a positive protective effect against T2DM outcomes.

Boxhammer E. et al. (2022) [2] evaluated the behavior of plasma-level concentrations of novel cardiovascular biomarkers (the soluble suppression of tumorigenicity 2 (sST2), growth differential factor-15 (GDF-15), heart-type fatty acid binding protein (H-FABP), insulin-like growth factor binding protein 2 (IGF-BP2) and soluble urokinase-type plasminogen activator receptor (suPAR)) in patients with severe aortic stenosis and an systolic pulmonary artery pressure (sPAP) < 40 mmHg compared to patients with an sPAP $\geq$ 40 mmHg before transcatheter aortic valve replacement. The authors established that elevated serum levels of sST2, H-FABP and IGF-BP2 showed the greatest potential for echocardiographic pulmonary hypertension detection in long-term follow-up after the procedure.

Arias-Colinas M. et al. (2022) [3] focused on the role of the parasympathetic nervous system in modulating the inflammation process. They included 13 patients who were admitted with a primary diagnosis of an active and symptomatic bacterial infection and 37 healthy volunteers in this longitudinal observational study. In the study, the serum levels of inflammatory biomarkers (C-reactive protein (CRP), IL1, IL4, IL6, IL10 and TNF-alpha) were measured, and the patients' cardiovascular autonomic function was thoroughly assessed. The authors found that an improvement in heart rate variability was associated with a decrease in the circulating levels of CRP.

Jirak P. et al. (2022) [4] reported that patients with sepsis exerted significantly increased plasma levels in cardiac biomarkers such as sST2, suPAR, GDF-15 and H-FABP compared to HF patients, STEMI individuals and healthy controls. This finding may open the door to new perspectives on how to implement circulating cardiac biomarker evaluation in septic patients with the aim of elucidating their cardiovascular risks.

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Topf A. et al. (2022) [5] investigated serum levels of sST2 in association with clinical presentation and left ventricular hypertrophy in 54 patients with resistant hypertension undergoing bilateral renal sympathetic denervation. The authors detected that baseline sST2 levels were not only positively correlated with systolic blood pressure but also predicted early success (at one month) after intervention. Moreover, the authors found that bilateral renal sympathetic denervation led to a significant decrease in sST2 levels after three months, indicating the plausible value of post-procedural sST2 as a predictive biomarker of residual adverse cardiac remodeling.

Ciapiene I. et al. (2022) [6] established that rivaroxaban and, possibly, its metabolites may be involved in a down-regulation of transcription activity in HUVECs through a reduced expression of CYP4F2 hsa-miRNA-24-3p—including both CYP4F2 expression and the CYP4F2 protein.

In a narrative review, Lichtenauer M. et al. (2022) [7] concluded that novel biomarkers of biomechanical stress (adrenomedullin), fibrosis (sST2, galectin-3, matrix metalloproteinases), inflammation (GDF15, TNA-alpha, IL-6, hs-CRP), oxidative stress (advanced glycation end products (AGEs), receptors for AGEs, non-coding and coding RNAs), and collagen turnover biomarkers seem to show potential predictive benefits in T2DM patients with HF, regardless of their natriuretic peptides.

Sipos B. et al. (2022) [8] provided an overview of the current state of four of the most promising cardiac biomarkers, including sST2, H-FABP, GDF-15 and suPAR, in terms of the accurate estimation of cardiovascular risk in certain patient populations, including those with HF and T2DM. The authors concluded that multiple biomarker models seem to be sufficiently powerful as compared with single biomarker use in the diagnosis, risk stratification and prediction of clinical outcomes.

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