



Emerging Biomarkers for Early Detection of Cardiovascular Disease

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Article History	Abstract
Received: 06 June 2023 Revised: 05 Sept 2023 Accepted: 27 Nov 2023	This extensive study explores the field of novel biomarkers for the early detection of cardiovascular disease (CVD), looking at a variety of indicators, including circulating endothelial cells, growth differentiation factor-15 (GDF-15), high-sensitivity C-reactive protein (hs-CRP), microRNAs, and myeloperoxidase (MPO). The review emphasizes how important these indicators are to improving CVD risk assessment, prognosis, and treatment plans. While each biomarker offers distinct insights into particular facets of cardiovascular health, multi-biomarker panel integration is suggested for a more thorough knowledge. The paper also discusses the difficulties with standardization, moral issues, and legal restrictions related to using these biomarkers in therapeutic settings. In addition, the revolutionary potential of these new biomarkers in conjunction with state-of-the-art technologies is emphasized, providing a promising path towards precision cardiovascular care and customized medicine.
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1. Introduction

A major contributor to rates of morbidity and mortality, cardiovascular disease (CVD) continues to be a global health concern. Globally, CVD is the leading cause of mortality, taking an estimated 17.9 million lives per year, according to the World Health Organization. Beyond death, millions more people experience a reduced quality of life as a result of the crippling effects of CVD, demonstrating the disease's severe impact.

A key factor in reducing the catastrophic consequences of CVD is early identification. Preventing severe cardiovascular events like heart attacks and strokes may be possible by identifying risk factors and indicators prior to the manifestation of overt symptoms and acting upon them promptly. Acknowledging the critical importance of timely identification, the medical field has focused on biomarkers as essential markers of underlying cardiovascular diseases.

Indicators of biological processes or diseases that can be measured, or biomarkers, present a promising way to identify cardiovascular health issues early on. Through a variety of diagnostic methods, these molecular signals can be discovered, offering insights into the cardiovascular system's physiological status. Biomarkers have the power to completely change the field of cardiovascular diagnostics. They can range from established markers like lipid profiles and troponins to novel indicators like microRNAs and growth differentiation factor-15 (GDF-15).

Biomarkers in Cardiovascular Disease

When it comes to cardiovascular disease (CVD), biomarkers are quantifiable markers that represent different biological processes or disorders pertaining to the cardiovascular system. These markers, which can be detected in physiological fluids such as blood, urine, tissues, or other fluids, offer