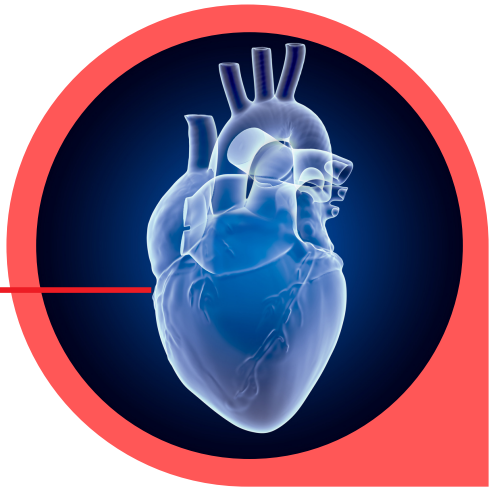
CARDIOVASCULAR PANELS



Diabetes mellitus, hypertension, obesity, genetics, environmental factors, immunity, inflammation, and oxidative stress are risk factors associated with cardiovascular disease CVD. The molecular mechanism underlying CVD remains unclear. Discovering novel biomarkers for early diagnosis, prevention, and personalized therapy, is essential and highly demanded.

Metabolite selection was done based on reports published in MarkerDB (https://markerdb.ca), HMDB (https://hmdb.ca) and literature reports (PMID: 16789974; PMID: 30101405; PMID: 30120222; PMID: 37342006)

Amino Acids and Derivatives
11

Accumulated evidence suggests that amino acids play important roles in regulating and maintaining vascular tone, coagulation and fibrinolysis, and immuno-inflammatory responses.

Biogenic Amines
10

Biogenic amines play a significant physiological role in cell proliferation and differentiation, signal transduction, membrane stability, and control of blood pressure, among other important functions.

Tryptophan metabolites
5

The tryptophan metabolite pathway plays an important role contributing to cellular energetic homeostasis in the form of nicotinamide adenine dinucleotide (NAD+), a common redox cofactor involved in various biological processes in the heart and vascular system.

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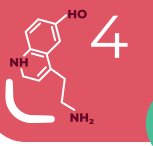
Catecholamines

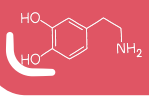
4



Catecholamines have been implicated in several pathologies. High and rising catecholamine levels are associated with a worsening prognosis in patients with heart failure.

Indole derivatives

5



Indoles contribute to maintaining the biological barrier of the human intestine with anti-inflammatory activities. However, the revealed nephrotoxicity and cardiovascular toxicity cannot be ignored.

Vitamines and co-factors

1

Choline has been associated with CVD.

Dipeptides

1

Carnosine is an endogenous dipeptide which exerts a strong anti-inflammatory activity. It exhibits antioxidant properties, scavenging reactive species and preventing oxidative stress-induced pathologies such as CVD.

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Sulfates
2

Sulfate is the fourth most abundant anion in human plasma and essential to all cells. Sulfate has also been connected to pathology through sulfation of toxic intermediates derived from dietary compounds, which in turn have been implicated in heart failure events. Protein-bound uremic toxins Indoxyl sulfate and p-cresyl sulfate are both associated with cardiovascular disease and all-cause mortality in subjects with chronic kidney disease.

Organic acids
9

Evaluation of organic acids provides information on important areas related to gut health, mitochondrial dysfunction, neurotransmitter status, indicators of detoxification and macronutrient breakdown, and nutritional status, which are essential for cardiovascular disease.

Short and Medium Chain Fatty Acids
6

SCFAs may play a significant role in the pathology of CVD and are key mediators in the gut–heart axis (restoration of mitochondrial function, amelioration of cardiac inflammatory response, and its utilization as an energy source) and remote effect attributable to a protective effect on the other organs

Lipids
22

The most widely studied classes of lipid metabolite biomarkers in CVD are phospholipids, sphingolipids/ceramides, glycolipids, cholesterol esters, fatty acids, and acylcarnitines. Ceramides is a minor subset of the lipidome that has a causative role in cardiometabolic conditions. Ceramides are abundant in cell membranes and have a significant role in intracellular signaling and in forming the structure of cellular membranes. Some ceramides are associated with cardiometabolic conditions independently of traditional risk factors.

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