

## GenBio CSO Dives Deep into the Subject of Protecting the Heart and Blood Vessels

The heart and blood vessels are essential!

ALISO VIEJO, CA, UNITED STATES, May 13, 2025 /EINPresswire.com/ --Protecting the Heart and Blood Vessels

The heart and blood vessels are essential since all living cells require an adequate supply of oxygen, nutrients and hormones. The blood vessels also remove metabolic waste from the cells for disposal, for example by the kidneys, lungs and liver. The cells of the heart require nutrients delivered by the coronary arteries and capillaries; the coronary veins return the deoxygenated blood and waste products back to the heart. The pumping action of the heart relies on the muscle cells that generate force when stimulated by electrical impulses generated by pacemaker cells in the heart.





Michael Fred Phelps II American former competitive swimmer. He is the most successful and most decorated Olympian of all time with a total of 28 medals

Fibroblasts are specialized cells between the muscle cells that secrete growth factors and signaling compounds to maintain the function of the heart muscle cells. Heart muscle cells are

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The problem with heart disease is the first symptom is often fatal.""

Michael Phelps

surrounded by a complex meshwork of fibres termed the extracellular matrix including many compounds such as collagen and fibronectin which help maintain the shape of the heart. Collagen is the most abundant protein in the human body as a basic building block. There are many different collagens, for example, type I in bones and type III in muscles and blood vessels.

Heart collagen increases with age and as a response to inflammation and heart injury. This increase in collagen in the extracellular matrix increases the stiffness of the heart, thus impairing the ability of the heart to contract to expel blood as well as decreasing the relaxation of the heart Reducing cardiovascular disease using nutraceuticals has a broad appeal. The most common symptom is an increased blood pressure (hypertension) leading to decreased oxygen supply to the heart muscle (ischaemic heart disease). In 2021, 20.5 million people died from a cardiovascular condition, around onethird of all deaths.



At the University of Southern Queensland, Professor Lindsay Brown and his research group studies the impact of functional foods on chronic inflammatory conditions

The symptoms of cardiovascular disease can be improved by losing body weight, increasing exercise, eating a balanced diet and controlling blood concentrations of lipids and glucose. Heart-healthy foods include leafy green vegetables, fruits such as apples, bananas, oranges and grapes, whole grains, and protein-rich foods such as fish, lean meats, eggs, nuts and legumes. Increased dietary fibre intake is important in reducing blood cholesterol concentrations. There is now increasing evidence that anthocyanins, the active molecules in purple fruits such as berries and plums, are effective anti-inflammatory compounds that also decrease blood pressure and arterial damage. Are there natural foods available that contain both anthocyanins and dietary fibre that could decrease cardiovascular damage?

GenBio's Chief Scientific Officer, Professor Lindsay Brown, tested this proposal by researching Queen Garnet and Davidson's plum in <u>in vivo testing</u> as both contain anthocyanins and dietary fibre. The Queen Garnet plum is a Japanese plum variety developed in Australia and Davidson's plum is an Australian tropical fruit used traditionally as a food and medicine. His peer-reviewed and published results showed that both plums improved cardiovascular structure and function, especially decreased blood pressure, decreased deposition of collagen and inflammatory cells in the heart, leading to a decreased stiffness of the chambers of the heart, together with decreased abdominal fat deposition. These results suggest that these in vivo cardiovascular responses to both Queen Garnet and Davidson's plum result from anthocyanin-induced improvements in the intestinal bacteria by the dietary fibre, together with the prevention of the influx of inflammatory cells in the heart.

Further, a small observational study by this research group reported decreased blood pressures

in mildly <u>hypertensive</u> patients given Queen Garnet plum juice daily, containing 255 mg cyanidin 3-glucoside equivalents for 12 weeks. The Queen Garnet juice was as effective as standard medications in this group, decreasing systolic blood pressure by  $12 \pm 3$  mmHg and diastolic blood pressure by  $9 \pm 2$  mmHg. This suggests that the blood vessels, rather than the heart muscle, are the major initial sites of cardiovascular action of anthocyanins. These actions are complementary as cyanidin 3-glucoside at doses of 10 and 20 mg/kg/day protected heart tissue from ischaemia-reperfusion injury by attenuating oxidative stress and ferroptosis-related protein expression.

Inflammation is a key driver of vascular disease such as atherosclerosis. Oxidative stress and inflammatory signaling in cells in the atherosclerotic plaque such as macrophages and endothelial cells can be reduced by direct antioxidant actions, by inducing intracellular Nrf2 activation and antioxidant gene expression and by anti-inflammatory responses such as increased antioxidant capacity of HDL and decreasing lipid/protein oxidation. In the observational study mentioned above, Queen Garnet plum juice also reduced insulin by  $6 \pm 3$  pmol/L, leptin by  $4 \pm 2.5$  ng/ml, and increased adiponectin by  $3.62 \pm 0.28$  µg/ml, indicating effective anti-inflammatory actions.

Physiologically relevant concentrations of cyanidin 3-glucoside and its metabolites decreased expression of the inflammatory mediators, IL6 and VCAM-1, in human vascular endothelial cells in culture. In hydrogen peroxide and LPS-stimulated diabetic human aortic endothelial cells, berry anthocyanins at 50  $\mu$ L/mL reduced oxidative stress and inflammation by inhibition of the NF- $\kappa$ B signalling pathway.

A preliminary event in the development of atherosclerosis is the increased apoptosis of the endothelial cells that line the blood vessels. Cyanidin 3-glucoside decreased inflammation, suppressed apoptosis, lowered blood lipid concentrations and improved artery wall structure and function. Berry anthocyanins may protect the vasculature in cardiometabolic disease by inducing NO production and decreasing inflammation and oxidative stress as well as changes in the gut microbiota. Reduced endothelial function is a predictive risk factor for the development of atherosclerosis. Queen Garnet plum juice, containing approximately 250 mg cyanidin 3-glucoside, reduced the reduced endothelial function following a high-fat meal in older humans. Further, platelet aggregation is more likely following endothelial damage. Platelet aggregation in vitro was decreased in healthy subjects following 21-day supplementation with Queen Garnet plum juice. Cyanidin 3-glucoside is the likely active component of the Queen Garnet and Davidson's plum juice, with possible additive effects of other flavonoids such as quercetin glycosides. Since these plums decreased blood pressure and attenuated some risk factors of metabolic syndrome, the research suggests that daily long-term consumption will attenuate the development of cardiovascular and metabolic diseases.

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