Heart disease and stroke
1st and 3rd leading causes of death in U.S.

•About 950,000 Americans die of cardiovascular disease each year, which amounts to one death every 33 seconds.

•About 61 million Americans (almost one-fourth of the population) have some form of cardiovascular disease.

•Stroke alone accounts for the *disability* of more than 1 million Americans.

Independent Research From Across the World Regarding Mangosteen's impact on Heart Disease & Stroke.

Chiral 2-amino-1-butanol xanthone derivatives as potential antiarrhythmic and hypotensive agents.
Acta Pol Pharm. 1999 Jan-Feb;56(1):87-90.
Librowski T, Czarnecki R, Jastrzebska M. Department of Pharmacodynamics, Collegium Medicum Jagiellonian University, Krakow, Poland.

Synthesis and antithrombotic effect of xanthone derivatives.
J Pharm Pharmacol. 1996 Sep;48(9):887-90.
Lin CN, Hsieh HK, Liou SJ, Ko HH, Lin HC, Chung MI, Ko FN, Liu HW, Teng CM.
School of Pharmacy, Department of Internal Medicine, Kaohsiung Medical College, Taiwan, R.O.C.
Researchers studied several xanthone derived compounds and found them to possess potent antithrombotic (anti clotting) activities.

Mechanism of vasorelaxation of thoracic aorta caused by xanthone.
Eur J Pharmacol. 1997 Oct 1;336(1):23-8. Cheng YW, Kang JJ. Institute of Toxicology, College of Medicine, National Taiwan University, Taipei.

The researchers showed vasorelaxation (relaxing of blood vessels, which lowers blood pressure) activity of the xanthones studied.

Antiplatelets activity of some xanthone derivatives. Acta Pol Pharm. 1999 Jul-Aug;56(4):319-24. Rajtar G, Zolkowska D, Kleinrok Z, Marona H. Department of Pharmacology and Toxicology, Medical University School, Lublin, Poland.

Researchers studied the effects of twelve xanthone derived compounds on platelet aggregation. They found **five of them inhibited thrombin-induced platelet aggregation (clot formation).**

Antihypertensive and vasorelaxing activities of Synthetic xanthone derivatives. Bioorg Med Chem. 2002 Mar;10(3):567-72. Wang LW, Kang JJ, Chen IJ, Teng CM, Lin CN. School of Pharmacy, Kaohsiung Medical University, Kaohsiung, Taiwan 807, ROC.

The researchers studied a series of xanthones and related compounds. The **antihypertensive** (against high blood pressure) and **vasorelaxing** (relaxing of the blood vessels to prevent high blood pressure) activity of compounds on cardiovascular system was evaluated. ***All the compounds tested exhibited effective hypotensive (lower blood pressure) activity*** **in anesthetized rats.**

Relationship between protective effect of xanthone on endothelial cells and endogenous nitric oxide synthase inhibitors. Bioorg Med Chem. 2003 Nov 17;11(23):5171-7. Jiang DJ, Hu GY, Jiang JL, Xiang HL, Deng HW, Li YJ. Department of Pharmacology, School of Pharmaceutical Sciences, Central South University, Cha ngsha 410078, China.

The researchers found that xanthone preserved endothelial cells inhibited the increased adhesion of monocytes to endothelial cells induced by oxidized LDL. This is especially important in **preventing plaque formation and the subsequent blockage of arteries and heart disease.**

Inhibition of lipoprotein oxidation by prenylated xanthones derived from mangostin.
Free Radic Res. 2000 Nov;33(5):643-59.
Mahabusarakam W, Proudfoot J, Taylor W, Croft K.
Chemistry Department, Prince of Songkla University, Hat Yai, Thailand.

Oxidative damage is thought to play a critical role in cardiovascular and other chronic diseases. This has led to considerable interest in the antioxidant activity of dietary compounds. The researchers have **previously shown that the xanthone, mangostin (found in mangosteen fruit), can inhibit the oxidation of LDL, low density lipoprotein (bad cholesterol).** Researchers studied more xanthone derived compounds and found enhanced antioxidant activities.
Note: If the oxidation of LDL cholesterol can be prevented or inhibited, then the LDL-cholesterol cannot exert its "bad" effect and cause heart disease.

Mangostin inhibits the oxidative modification of human low density lipoprotein.
Free Radic Res. 1995 Aug;23(2):175-84. Williams P, Ongsakul M, Proudfoot J, Croft K, Beilin L. University of Western Australia, Department of Medicine, Royal Perth Hospital, Australia.

The oxidation of low density lipoprotein (LDL) may play an important role in atherosclerosis. The researchers investigated the possible antioxidant effects of mangostin, isolated from Garcinia mangostana (found in mangosteen fruit), on the oxidation of human LDL (bad cholesterol). **From these results, it is concluded that mangostin is acting as a free radical scavenger ("mop up" sponge) to protect the LDL from oxidative damage in this in vitro system. In other words, it is a potent antioxidant.**