

## Individual Anteaox Phenols and Cardiovascular Disease

### Gallic and Protocatechuic Acids

*“Research involving both animals and humans has proven that phenolic acids possess cardioprotective properties such as anti-hypertensive, anti-hyperlipidemia, antifibrotic and anti-hypertrophy activity. Furthermore, numerous studies have proven that phenolic acids in phytochemical constituents such as gallic acid, caffeic acid and chlorogenic acid are promising anti-inflammatory agents.”* [33. Reviews in Cardiovascular Medicine, 2020](#)

### Caffeic Acid and Caffeic Acid Phenethyl Ester (CAPE)

*“Caffeic acid and its derivatives display major actions on the cardiovascular system.. Besides their vasorelaxant activity, CA and CAPE also lower heart rate and suppress the renin-angiotensin-aldosterone axis, which explains their blood pressure-lowering activity...Caffeic acid phenethyl ester is the most studied compound, and shows marked anti-atherosclerotic and anti-angiogenic effects, as well as protection against ischemia/reperfusion lesions, which is why it is the one with the highest potential for translation into clinical medicine.”* [34. Frontiers in Physiology, 2020](#)

### Curcumin

*“As exemplified in this review, curcumin plays a critical role in protecting humans and animals from cardiovascular dysfunction which is always the primary step for CVDs including atherosclerosis, aortic aneurysm, MI and stroke... Furthermore, its anti-oxidant, anti-inflammatory and anti-apoptotic properties have been reported to be effective in improving cardiac hypertrophy, heart failure, diabetic cardiovascular complications and cardiotoxicity...therefore, curcumin will become a routine food supplement such as vitamins and fish oil, to prevent or treat CVDs.”*

[35. Biotechnology Advances, 2019](#)

### EGCG

*“EGCG was found to exhibit a wide range of therapeutic properties including anti-atherosclerosis, antiscardiac hypertrophy, anti-myocardial infarction, anti-diabetes, anti-inflammatory and antioxidant. These therapeutic effects are mainly associated with the inhibition of LDL cholesterol (anti-atherosclerosis), inhibition of NF-κB (anti-cardiac hypertrophy), inhibition of MPO activity (anti-myocardial infarction), reduction in plasma glucose and glycated haemoglobin level (anti-diabetes), reduction of inflammatory markers (anti-inflammatory) and the inhibition of ROS generation (antioxidant).”* [36. Journal of Ethnopharmacology, 2018](#)

### Kaempferol

*“Flavonoids have an important involvement in preventing cardiovascular disease, mainly due to their antiatherogenic, antithrombotic, and antioxidant properties. In vitro and in vivo studies have shown that flavonoids can modulate the activity of numerous inflammatory mediators, and can also inhibit immune cells, thus representing an alternative in the development of new anti-inflammatory drugs.”*

[37. Molecules, 2020](#)

### Resveratrol

*“The presented data in this study have demonstrated the role of resveratrol in prevention of cardiovascular abnormalities induced by atherogenic diet. The overall data revealed that resveratrol possesses the cardioprotective effect by improving the serum lipid profile, antioxidant system, improving lipid metabolism, and cardiac tissue damages either in myocardium and aorta.”*

[38. IntechOpen, 2018](#)

## **Quercetin**

*“In conclusion, the results of this meta-analysis showed a significant effect of quercetin supplementation in the reduction of BP, which suggest that this nutraceutical might be considered as an add-on to antihypertensive therapy.”* 39. Journal of the American Heart Association, 2016

## **Ferulic Acid**

*“These data indicate ferulic acid supplementation can improve lipid profiles and oxidative stress, oxidized LDL-C, and inflammation in hyperlipidemic subjects. Therefore, ferulic acid has the potential to reduce cardiovascular disease risk factors.”* 40. Nutrients, 2018

## **Formononetin**

*“The study indicates that formononetin can improve hyperglycemia and hyperlipemia, reduce oxidative stress and increase SIRT1 expression. It can be a potential therapeutic agent for diabetic cardiomyopathy.”* 41. Asian Pacific Journal of Tropical Biomedicine, 2021

## **Catechin**

*“There is a large body of evidence that supports the numerous cardioprotective effects of catechin consumption, namely, a reduction in systemic blood pressure, increase in FMD, and an attenuation of atherosclerosis, platelet activation, and thrombosis formation.”*

42. Arterioscler Thromb Vasc Biol, 2017

## **Cinnamic Acid**

*“In addition, the echocardiography evidenced that CA is able to protect the aorta and aortic arch and avoided vasoconstriction by increasing their diameters and improved liver steatosis and kidney indices of toxicity. Overall, these results suggest that cinnamic acid exerts anti-obesity and antihypertensive effects through inhibition of lipid digestive enzymes and ACE.”*

43. J Food Sci Technol, 2015

## **Ellagic Acid**

*“In summary, we provided the strong evidence that ellagic acid can limit the severity of myocardial infarction through the resolution of inflammation by influencing the expression of TLR4 and the phosphorylation level of p65, IκB and ERK1/2...This raises the possibility that ellagic acid and targeting TLR4/ERK/NF-κB signaling pathway may have potential therapeutic value for patients with myocardial infarction.”* 44. Int J Clin Exp Med, 2018

## **Hydroxybenzoic Acid**

*“The hydroxybenzoic acids are related to salicylic acid and salicin, the first compounds isolated that have a pharmacological activity. In this review we examine how a number of hydroxyphenolics have the potential to ameliorate cardiovascular problems related to aging such as hypertension, atherosclerosis and dyslipidemia.”* 45. Nutrition Journal, 2014

## **p-Coumaric Acid**

*“These data strongly demonstrate that CA is a powerful OH (hydroxyl radical) scavenger, capable of virtually eliminating the OH generated. Thus CA may block LDL peroxidation and reduce serum cholesterol levels by scavenging OH.”* 46. Am J Physiol Cell Physiol, 2000