# Individual Anteaox Phenols and Liver Diseases

## Caffeic and Ferulic Acids, Curcumin and Catechin

*"The available literature reviewed herein reveal that a large number of plants and phytochemicals mediating antioxidant and anti-inflammatory properties appear hepatoprotective in preclinical models of APAP-induced liver injury... All of them were shown to restore the liver enzymes and also protect liver cellular architecture. These plants and phytochemicals may provide novel chemical entities for future drug discovery and development against APAP-induced liver toxicity."*
47.International Journal of Molecular Sciences, 2018

## p-coumaric Acid

*"In conclusion, the present findings showed that p-coumaric acid protect liver function by improving liver enzymes. The probable involved mechanism by which p-coumaric exert its beneficial effect against IR injury was improving endogenous antioxidants potency."*
48. Physiology and Pharmacology, 2021

## Quercetin, Resveratrol, EGCG and Curcumin

*"In summary, exploration on natural products against liver fibrosis is increasingly thorough. Natural products are a potential resource for the development of agents to treat liver fibrosis. ,us, natural products are very valuable when seeking novel therapeutic agents for liver fibrosis."*
49. Evidence-Based Complementary and Alternative Medicine, 2020

## Cinnamic Acid

*"CA's therapeutic effect on NAFLD may be attributed to its ability of lowering hepatic lipid accumulation, which is mediated by suppression of hepatic lipogenesis and fatty acid intake, as well as increased fatty acid oxidation."* 50. Research Square, 2021

## Hydroxybenzoic Acid

*"..higher hydroxybenzoic acid intake was independently associated with lower odds of NAFLD, higher HRI and fibrosis."* 51. Journal of Hepatology Reports, 2020

## Kaempferol

*"Our study also demonstrated that kaempferol markedly inhibited the synthesis of collagen and activation of hepatic stellate cells (HSCs) both in vivo and in vitro…Above all, our data indicate that kaempferol may prove to be a novel agent for the treatment of liver fibrosis or other fibroproliferative diseases."* 52. J Cell Mol Med, 2019

## Protocatechuic Acid

*"Dietary supplementation of PCA, a bioactive phenolic metabolite of polyphenol C3G attenuated insulin resistance with reduced hepatic lipids accumulation, inflammation and damage in a NAFLD model induced by HFD."* 53. Research Square, 2021

## 3,4 Dihydroxyphenylacetic Acid

*"In a recent study, a microbiota-derived metabolite of quercetin; 3,4-dihydroxyphenylacetic acid has also been found to restore liver enzymes, attenuate lipid peroxidation, augment antioxidants and salvage the histology. It was found to promote Nrf2 translocation to the nucleus and enhance the expression of phase II enzymes and antioxidant enzymes that promotes APAP detoxification."*
54. International Journal of Molecular Sciences, 2018

## Caffeic Acid Phenethyl Ester (CAPE)

*"Our results demonstrate that CAPE treatment decreased liver injury and serum oxidant enzyme levels caused by fluoxetine treatment. CAPE treatment also increased antioxidant enzyme levels in the present study. Furthermore, positive contribution of CAPE to recovery of hepatic modifications caused by fluoxetine was observed at tissue level. This indicated the benefit of CAPE on liver injury induced by fluoxetine."* 55. BioMed Research International, 2016

## Ellagic Acid

*"A growing body of evidence suggests that the intake of EA is effective in attenuating obesity and ameliorating obesity-mediated metabolic complications, such as insulin resistance, type 2 diabetes, nonalcoholic fatty liver disease, and atherosclerosis. In this review, we summarize how intake of EA regulates lipid metabolism in vitro and in vivo, and delineate the potential mechanisms of action of EA on obesity-mediated metabolic complications. We also discuss EA as an epigenetic effector, as well as a modulator of the gut microbiome, suggesting that EA may exert a broader spectrum of health benefits than has been demonstrated to date."* 56. American Society for Nutrition, 2016

## Formononetin

*"Taken together, our study demonstrates that formononetin ameliorates hepatic cholestasis by upregulating expression of SIRT1 and activating PPARa, which is an important anti-cholestatic mechanism of formononetin."* 57. Biochemical and Biophysical Research Communications, 2019

## Gallic Acid

*"The expression analysis of hepatic steatosis-related genes showed that gallic acid treatment inhibits the expression of the ACACA and FASN genes in the liver.. In short, these findings provide strong support for the clinical treatment of metabolic diseases such as obesity, dyslipidemia, and inflammation response."* 58. International Journal of Molecular Sciences, 2021