

# EGCG SAP

Science-based ultra-antioxidant from green tea, berries, grapes, and tomatoes

Consuming green tea has been associated with a lowered risk of several types of human cancers and cardiovascular disease. Epigallocatechin gallate (EGCG), a potent natural antioxidant, is the major chemopreventive agent in green tea. Evidence also suggests green tea extract and EGCG contribute to weight loss, through increased fat oxidation and caloric expenditure. Anthocyanidins are colourful antioxidant compounds found in high concentrations in fruits and berries, that protect against oxidative stress and maintain DNA integrity. Anthocyanidins also act as anti-inflammatory and antimutagenic agents, and—by helping maintain vascular permeability—offer cardioprotection. In human trials, supplementation with lycopene, a potent carotenoid antioxidant, has improved blood pressure, lipid peroxidation, LDL-cholesterol oxidation, protein oxidation, and symptoms of prostate cancer.

## ACTIVE INGREDIENTS

Each non-GMO vegetable capsule contains:

Green tea (*Camellia sinensis*) extract, 75% EGCG ..... 500 mg  
Tomato (*Solanum lycopersicum*) extract, 10% lycopene ..... 50 mg

Fruit blend, 20% multianthocyanidins ..... 150 mg

\*Provided by 150 mg of a fruit blend extract of *Vaccinium myrtillus* (fruit and extract) and *Vitis vinifera* (skin and seed extracts).

This product is non-GMO.

**Contains no:** Gluten, soy, wheat, corn, eggs, dairy, yeast, citrus, preservatives, artificial flavour or colour, starch, or sugar.

EGCG SAP (ultra-antioxidant) contains 30 capsules per bottle or 60 capsules per bottle.

## DIRECTIONS FOR USE

**Adults:** Take 1 capsule daily with food or as directed by your healthcare practitioner. Consult a healthcare practitioner for use beyond 12 weeks.

1 capsule provides 375 mg of epigallocatechin gallate (EGCG), 30 mg of multianthocyanidins, 5 mg of lycopene, and <2.5 mg of caffeine.

**WARNING:** Do not take if you are pregnant or breast-feeding.

## INDICATIONS

Independent daily use of **EGCG SAP** supplies the body with potent antioxidants to improve whole-body antioxidant status and contribute to amelioration of chronic disease processes such as cancer and cardiovascular disease. Green-tea EGCG is also expected to contribute to increased thermogenesis.

## RANGE OF SOURCES AND HIGH CONCENTRATION TO INCREASE EFFICACY

**EGCG SAP** provides a broad spectrum of antioxidants, including catechins, polyphenols, anthocyanidins, and carotenoids from green tea, cranberry, elderberry, bilberry, strawberry, cherry, raspberry, grape, and tomato extracts.

The very high-potency green tea extract in **EGCG SAP** is standardized to contain 98% polyphenols, 90% catechins and 75% EGCG, allowing for increased dose and efficacy with each capsule.

Epicatechin, epicatechin gallate, and epigallocatechin are other polyphenols present in this extract.

## PURITY AND CLEANLINESS

All ingredients listed for all **EGCG SAP** lot numbers have been tested by a third-party laboratory for identity, potency, and purity.



Scientific Advisory Panel (SAP):  
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## GREEN TEA AND EGCG

Green tea, from the plant *Camellia sinensis*, originated in Southwest China 5000 years ago and was originally used as a medicine for various illnesses.<sup>[1]</sup> Recently, it has been identified that the polyphenolic constituents of green tea extracts are responsible for its pharmacological properties.<sup>[2]</sup>

The major polyphenol found in green tea, belonging to the catechin family, is epigallocatechin gallate (EGCG). Green tea also contains lesser amounts of catechin, epicatechin, gallocatechin, gallocatechin gallate, epigallocatechin, and epicatechin gallate.<sup>[1, 2]</sup> EGCG is considered the most significant active component of green tea and is known to have powerful antioxidant and chemoprotective effects attributed to the flavan-3-ol structure linked to EGCG's gallic acid.<sup>[3, 4]</sup>

Currently, tea is the second most consumed beverage in the world.<sup>[5]</sup>

## ANTHOCYANIDINS

Anthocyanidins belong to the flavonoids family and are polyphenols. They are natural antioxidants that are common components of fruits and vegetables, in particular edible berries.<sup>[6]</sup> They provide colour and, depending on their pH and the presence of chelating metal ions, they are intensely coloured in blue, violet or red.<sup>[6]</sup>

Common anthocyanidins are cyanidin, delphinidin, malvidin, pelargonidin, peonidin, and petunidin.<sup>[6]</sup>

The American diet provides as much as 180–215 mg/d of anthocyanidins attributed to an increase in commercially available berry extract consumption.<sup>[6, 7]</sup>

## LYCOPENE

Lycopene is a natural carotenoid pigment synthesized by plants and microorganisms, and diet constitutes the primary source of lycopene for humans. The red colour of tomatoes is due to the presence of lycopene.

Biological actions for a variety of doses of dietary lycopene (5 to 150 mg/d) from foods and tomato oleoresin extract in humans include decreased serum lipid peroxidation, decreased serum LDL oxidation, decreased protein oxidation, increased total antioxidant potential and a trend toward decreased serum DNA oxidation.<sup>[8, 9]</sup>

## ANTIOXIDANTS AND REACTIVE OXYGEN SPECIES

Oxygen-derived free radicals known as reactive oxygen species (ROS) are generated through normal metabolic activity, lifestyle activities, and diet. Free radicals cause oxidative damage to lipids and proteins and compromise the integrity of genomic DNA.<sup>[4]</sup> As such, they are widely recognized to be at the root of several degenerative diseases including cancer.<sup>[4]</sup>

Antioxidants act as inhibitors at both the initiation and promotion stages of tumour promotion or carcinogenesis, and they function to protect cells against oxidative damage.<sup>[4]</sup> Other functions of antioxidants are to scavenge free radicals and to serve as inhibitors of neoplastic processes.<sup>[4]</sup>

Due to their polyphenolic nature, anthocyanidins and EGCG are efficient antioxidants.<sup>[1]</sup> They scavenge reactive oxygen and nitrogen species, thus reducing damage to lipid membranes, proteins, and nucleic acids.<sup>[1, 6, 10]</sup> Moreover, green tea catechins allow for prolonged antioxidant protection beyond that of vitamin C (ascorbic acid),<sup>[11]</sup> and green tea catechins<sup>[11]</sup> and lycopene<sup>[12]</sup> have demonstrated greater antioxidant capacity than vitamin E (-tocopherol) and β-carotene.<sup>[11, 12]</sup>

## NUTRITIONAL RESEARCH

### Cancer

**Green Tea and EGCG** — Case-control and cohort studies have reported an inverse association between green tea consumption and cancers of the breast, colon and rectum, pancreas, stomach, ovary and lung in non-smoking women, as well as prevention of recurrence in stage I and II breast cancer patients.<sup>[2, 3]</sup>

More specifically, EGCG has been predicted to guard against carcinogenesis by blocking cell membrane receptors, repressing the catalytic activities of several P-450 enzymes including P-450 1A and 2B1, and enhancing cancer detoxification enzymes.

In vitro studies, green tea polyphenols blocked nitrosamines, suppressed carcinogenic activity in lung, breast, colon, and melanoma cancers, and inhibited estrogen receptor interaction in mammary cancer cell lines. Animal studies found significantly increased activity of antioxidant and detoxification enzymes (glutathione reductase, glutathione peroxidase, glutathione S-transferase, catalase, and quinone reductase) in the lungs, liver, and small intestine following green tea consumption.<sup>[13]</sup>

**Anthocyanidins** — Studies have revealed that anthocyanidins can inhibit the growth of embryonic fibroblasts and of cancer cells derived from malignant human tissues from a variety of origins including lung, breast, uterus, vulva and colon.<sup>[7]</sup>

The potential mechanisms of cancer chemoprevention by anthocyanidins include anti-initiation via antimutagenic effects and antioxidative effects, antipromotion via inhibition of transformation (ROS, MAP kinase, AP-1), anti-inflammatory effects (COX,

PGHS, NO) and inhibition of proliferation, and finally antiprogression via induction of programmed cell death (ROS, JNK, Caspase-3) and inhibition of metastasis (MMPs).<sup>[6]</sup>

**Lycopene** — Epidemiological studies have linked dietary intake of tomatoes and lycopene to prevention of prostate cancer and associated a 30–40% reduction in prostate cancer risk with high tomato or lycopene consumption.<sup>[14]</sup>

Lycopene, at physiological concentrations, can inhibit human cancer cell growth by interfering with growth factor receptor signaling and cell cycle progression, specifically in prostate cancer cells, without evidence of toxic effects or apoptosis of cells. Furthermore, by upregulating intercellular gap junction communication, cessation of cell division and induction of protective metabolizing enzymes in the liver, lycopene has also been found to inhibit proliferation of several types of cancer cells, including those of the prostate, breast, lung and endometrium.<sup>[15, 16]</sup>

### Cardiovascular Disease

**Green Tea and EGCG** — Epidemiological studies have demonstrated a relationship between green tea consumption and decreased cardiovascular risk.<sup>[1]</sup> For heart disease protection, the potent antioxidant properties of polyphenols inhibit the formation of atherosclerotic plaques by reducing free-radical damage to cells and preventing LDL cholesterol oxidation.<sup>[1]</sup>

**Anthocyanidins** — Epidemiological studies also indicate that moderate intake of anthocyanidins is associated with a lower risk of coronary heart disease (CHD)<sup>[10]</sup> by mechanisms such as maintaining vascular permeability.<sup>[5]</sup>

**Lycopene** — Recent epidemiological studies have shown an inverse relationship between tissue and serum levels of lycopene and mortality from CHD, cerebrovascular disease, and myocardial infarction.<sup>[17]</sup> As a dietary antioxidant, lycopene prevents oxidation of LDL-cholesterol,<sup>[8]</sup> provides a hypocholesterolemic effect,<sup>[17]</sup> enhances LDL degradation, LDL particle size and composition, as well as plaque rupture, and alters endothelial functions.<sup>[17]</sup> In addition, lycopene significantly decreased systolic and diastolic blood pressure in patients with grade-1 hypertension by 7% and 5%, respectively.<sup>[18]</sup>

### Weight Loss

Studies suggest a role for catechins in the promotion of weight loss and increasingly more trials are exploring this area.<sup>[1]</sup> Research supports that observed changes in body composition following green tea or green tea extract consumption occur through sympathetic activation of thermogenesis and fat oxidation. These results appear to be attributable to components in green tea beyond its caffeine content, perhaps through a synergism with caffeine.<sup>[1]</sup>

### SAFETY

Green tea and green tea extract have not been associated with having adverse effects in multiple toxicological tests. However, tannins and polyphenols in green and/or black tea may interfere with the absorption of calcium, iron and zinc but increase that of manganese and copper.<sup>[1, 19]</sup>

It is not recommended that green tea extract be consumed by pregnant or breast-feeding mothers. Anthocyanidins from berries and fruits are widely consumed and considered non-toxic and safe for human consumption. Lycopene from natural tomato oleoresin extract has generally recognized as safe (GRAS) status with the US FDA.

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