

# SKIN PROTECT™

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SKIN PROTECT'S advanced technology helps the skin achieve and maintain a state of healthy homeostasis by supporting the skin's innate ability to prevent oxidative damage and inflammation and by buffering environmentally-induced stress. This unique formula blends cosmetic grade phyto-nutrients, liposomal nutritional compounds, unique fatty acids and essential oils. The efficacy of these state-of-the-art compounds in treating compromised skin has been validated through traditional usage, clinical experience and scientific research.

The botanical extracts in Skin Protect contain numerous polyphenols that act as antioxidants to modulate carcinogen metabolism, scavenge free radicals, inhibit cell proliferation, arrest the cell cycle and induce apoptosis. Nutrients vital to the skin inhibit oxidation and replenish the body's endogenous store of antioxidants. Essential oils inhibit damage from UV radiation and work synergistically to protect the skin from damage and help it to heal. Skin Protect also utilizes exceptionally mild natural emulsifiers, which provide emollience and moisturization. It has been formulated to ensure that its active compounds maintain molecular stability and are easily absorbed through the skin. An all-natural product, Skin Protect is free of parabens, pthalates, sodium laurel sulfate and petrolatum. It is cruelty-free and is not tested on animals.

## ENVIRONMENTAL FACTORS

The sun emits ultraviolet (UV) radiation in 3 forms, UVA, UVB and UVC, the latter of which is blocked by the ozone layer. The effects of ultraviolet radiation on the skin include the formation of melanin from melanocytes in the skin and the formation of vitamin D via synthesis from cholesterol. Exposure to UV radiation also results in a host of degenerative changes associated with the aging of skin. Loss of elasticity, development of wrinkles and dark spots, and the formation of actinic keratosis are all associated with prolonged sun exposure. The loss of

our ozone layer further contributes to skin damage via increased exposure to UV radiation from sunlight.

Many external factors contribute to skin cancer and premature aging other than sun exposure. These include a variety of phenolic compounds utilized in industry (e.g., for the production of phenol-formaldehyde resins, paints and lacquers, cosmetics and pharmaceuticals). They can be toxic to the skin, causing rash, dermal inflammation, contact dermatitis, de-pigmentation and cancer promotion. These and other factors such as cigarette smoke, ethanol, stress, nutrient deficiencies and poor diet (especially refined fats and sugars) trigger the production of free radicals and oxidative stress, contributing to skin cancer, other skin diseases and skin aging. Environmental pollutants are either oxidants themselves or catalyze the production of Reactive Oxygen Species (ROS) directly or indirectly. ROS are believed to activate proliferative and cell survival signaling that can alter apoptotic pathways that may be involved in the pathogenesis of a number of skin disorders including photosensitivity diseases and skin cancers.<sup>1</sup> Skin Protect provides therapeutic levels of unique and highly advanced antioxidants that when applied to the skin interact with ROS or their by-products to either eliminate them or to minimize their deleterious effects.

## THE SKIN

The skin is our largest organ. It has two main layers, a thin outer layer called the epidermis, and an inner layer known as the dermis, which is about four times thicker. The epidermis plays a central role in host defense and is composed of keratinocytes, which function both as a physical barrier and an early warning system.<sup>2</sup> The dermis is composed primarily of connective tissue produced by fibroblasts.<sup>3</sup> The dermis contains collagen, elastin and other fibers that support the skin's structure and give skin its smooth and youthful appearance. These elements of the skin are damaged by UV radiation, especially by the longer wavelength waves called UVA. Beneath the dermis



SKIN CARE FORMULAS

## THERAPEUTIC ACTIONS AND APPLICATIONS

- promotes healthy, moist and vibrant skin
- decelerates skin aging
- protects against oxidative and inflammatory damage
- promotes proper cell behavior

APPLIED RESEARCH AND REFERENCES



is a final layer called the subcutaneous layer, which is essentially an insulating layer of lipids. Prolonged oxidative stress to the skin, particularly to the subcutaneous fat layer, accelerates aging of the skin and can lead to skin cancer.

UV light generates ROS within the skin. Oxidative damage mediated by ROS and other free radicals contributes to the initiation of cancers through damage to DNA. ROS also damages other biological molecules by stripping electrons from them in order to fill their own electron needs and reach a more stable state. This is referred to as free radical damage. When it occurs frequently enough, it causes extensive damage to lipids (lipid peroxidation), proteins, enzymes and other cell components by breaking or changing their bond structure, opening carbon rings and removing functional groups.<sup>4-7</sup> These same factors also cause inflammatory changes and reduce collagen production, which is why many of the ingredients in Skin Protect help restore and protect tissue collagen levels.

The skin naturally protects itself using low molecular weight antioxidants that neutralize oxidative stress before it can cause damage. Most antioxidant protection depends on dietary intake and subsequent delivery to the skin. The topical use of antioxidants affords a direct, protective influence on areas of the skin most at risk for oxidative damage.<sup>8</sup>

## SKIN CANCER

Skin cancer is the most common cancer. The incidence of all skin cancers has been rising 4% to 5% each year and there are now more than 1.3 million new cases diagnosed annually. The incidence of melanoma has nearly tripled in the last 4 decades -- a rate faster than that of any other cancer. Basal cell carcinoma is the most common type of skin cancer, comprising about 80% of all cases. Squamous cell carcinoma is the second most common type. These occur most commonly on sun-exposed areas but can occur on all body sites, including the mucous membranes. Squamous cell cancers do have metastatic potential; however, the most dangerous type of skin cancer is melanoma.

Protective clothing and the use of sunblock is the standard approach to prevent skin damage and the development of skin cancer today; however, studies around the issue of chemical sunblocks differ in their outcomes.<sup>9-14</sup> Most of the body's vitamin D supply (about 75%) is generated by the skin's exposure to UVB rays.<sup>15</sup> Sunscreen use has been shown to drastically lower the cutaneous production of vitamin D3.<sup>16</sup> A low blood level of vitamin D is known to increase the risk for the development of breast and colon cancer and may also accelerate the growth of melanoma.<sup>15-17</sup> Skin cancer is a complex multistage process that develops in three stages: initiation, promotion and progression.<sup>18</sup> These processes are mediated by various cellular, biochemical and molecular changes. ROS have been shown to be involved in all three stages.

## INGREDIENTS

The ingredient section below focuses on the applications of the specific agents in Skin Protect with regard to the skin, oxidative damage and topical application. The monographs for these plants and nutrients are extensive and delve more deeply into their widespread, well-documented internal usage.



## EMOLLIENTS/OILS

### SEA BUCKTHORN OIL

Sea Buckthorn (*Hippophae rhamnoides*) has been known for centuries as a source of nutrients, a skin care remedy and a cosmetic aid with nourishing, revitalizing and restorative action. Traditionally, sea buckthorn oil was used to promote the healing of skin problems, such as burns, sunburns, eczema, psoriasis and conditions of mucous membranes, including ulcers and erosions. Due to its richness in nutrients essential for the nourishment of healthy skin, sea buckthorn oil helps combat wrinkles, dryness and other symptoms of malnourished or prematurely aging skin. It is also taken to improve the conditions of the mucous membranes of the gastro-intestinal tract and as a natural dietary supplement.<sup>19-23</sup>

The Greeks, Romans, Russians, Tibetans and Chinese have used this plant in traditional medicine for centuries. In ancient Greece the fruit of sea buckthorn were added to horse feed to increase the shine of the coat and support the health of horses. It is for this reason that the Latin name *Hippophae* is derived from the Greek words for horse (*hippos*) and shiny (*phaos*).

### SQUALANE

Derived from olive oil, the phyto-squalane in Skin Protect helps to maintain the skin's health, moisture and softness. It is known for its ability to protect the skin from UV-induced lipid peroxidation, boost cell regeneration and oxygenation, reduce the appearance of wrinkles and prevent the formation of age spots.

Squalane is a potent inducer of several detoxifying enzymes and can assist in the detoxification and excretion of lipophilic xenobiotics. It is not very susceptible to peroxidation and therefore can function in the skin as a quencher of singlet oxygen, protecting the human skin surface from lipid peroxidation due to UV radiation and other sources of ionized radiation. Squalane is a triterpene that is an intermediate in the cholesterol biosynthesis pathway. It was so named because of its occurrence in shark liver oil, which contains large quantities and is considered its richest source. However, it is widely distributed in nature, with reasonable amounts found in olive oil, palm oil, wheat-germ oil, amaranth oil and rice bran oil. Squalane, the main component of skin surface polyunsaturated lipids, shows some advantages for the skin as an emollient and antioxidant and for hydration and antitumor activities.<sup>24</sup>

### SHEA BUTTER

Shea butter is fat derived from the seed of an African tree called *Butyrospermum partii*. It is highly saturated and consists of palmitic, stearic, oleic and linoleic acids. It is traditionally used on the skin as a protective agent and moisturizer with anti-inflammatory effects on mucosal membranes.

## PHYTO-COSMOCEUTICALS

### GRAPE SEED AND SKIN

Within the whole grape are a group of polyphenols consisting of antioxidant phytonutrients, including resveratrol, anthocyanins, catechins and quercetin. These constituents are believed to help the body's cells resist damage by free radicals. Grape seed extract

(GSE) is a rich source of flavonoids, a family of polyphenols that display a remarkable ability to inhibit cellular damage to the skin, inhibit aging of the skin and promote healing of the skin. GSE proanthocyanidins have been reported to possess a broad spectrum of pharmacological and medicinal properties against oxidative stress and provide excellent protection against free radicals in both in vitro and in vivo models. GSE has shown significantly better free radical scavenging ability than vitamins C, E, and beta-carotene and demonstrated significant cytotoxicity towards human breast, lung and gastric adenocarcinoma cells, while enhancing the growth and viability of normal cells.<sup>25</sup>

GSE also reinforces the natural cross-linking of collagen that forms the matrix of connective tissue, a very important function during any post-surgical healing. It exerts an anti-inflammatory action by preventing the release and synthesis of compounds that promote inflammation, including histamines, serine proteases and prostaglandins.<sup>26-28</sup> Its mechanisms of anti-inflammatory action are also relevant to oxygen free radical scavenging, anti-lipid peroxidation and inhibition of the formation of inflammatory cytokines.<sup>29</sup>

#### VITAL ADAPT - HERBAL ADAPTOGENS

The term adaptogens originated in Russia with research involving the practice of using herbs on a daily basis to prevent disease, slow down the aging process, enhance health and well-being and increase one's ability to cope with stress. Adaptogens are defined as any agent that increases the nonspecific resistance of an organism to stress and other environmental influences. The use of adaptogens can enhance our adaptive capability to the stress caused by prolonged exposure to the sun. Plant adaptogens are nontoxic, normalize bodily processes, and have recently been shown to be photoprotective when taken orally or applied externally.<sup>30</sup>

#### TURMERIC (CURCUMA LONGA)

Turmeric's active constituents are yellowish-orange volatile oils called curcuminoids, which have demonstrated anti-inflammatory, antioxidant, anti-neoplastic, antiviral and immunomodulation activity in vitro, in animals and in some human studies.<sup>31</sup> Curcuminoids inhibit leukotriene biosynthesis via the lipoxygenase pathway and decrease prostaglandin formation. Curcumin has caused apoptosis in various cancer cell lines and animal tumor cells<sup>32</sup> and has been shown to inhibit angiogenesis.<sup>33</sup>

Dietary curcumin in rats and mice has demonstrated preventive activity against carcinogenesis in the skin, colon, forestomach and duodenum.<sup>34</sup> An ethanol extract of turmeric, applied externally for the treatment of skin cancer (where all other treatments failed) has demonstrated pain relief, reduced itching and promoted healing.<sup>35</sup> Curcumin has been shown in several studies to inhibit skin cancer and specifically induce apoptosis in human melanoma cells.<sup>36-38</sup>

#### ROSEMARY (ROSEMARY OFFICINALIS) OLEORESIN EXTRACT

Rosemary is a powerful antioxidant that increases overall vitality and improves circulation. At least six phenolic diterpenoids with antioxidant activity exist in rosemary. The most powerful of these diterpenoids appears to be carnosic acid. As a carnosic acid molecule does its job of quenching a free radical, it transforms

into another antioxidant compound called carnosol. The transformation of one antioxidant to another repeats itself three times. This cascade of antioxidant activity is quite uncommon and may explain its positive results in certain studies. ROS-induced mutagenicity is inhibited by rosemary, as well as cell-mediated oxidation of low density lipoproteins (LDL).<sup>39</sup>

Rosemary also contains significant amounts of rosmarinic acid, a phenolic acid. Unlike carnosic acid, rosmarinic acid is a water-soluble antioxidant and extracts containing rosmarinic acid score extremely high on the ORAC (Oxygen Radical Scavenging Activity) analyses, an in vitro method used to measure dietary antioxidant capacity of water-soluble substances. Rosmarinic acid is also antiviral and anti-inflammatory (via COX-2 inhibition). Phenolic acids also delay vitamin E depletion.<sup>40-43</sup>

#### URSOLIC ACID

Ursolic acid is a compound that exists in many foods, herbs and other plants, including apples, cranberries, basil, oregano, peppermint and sage, the richest known source. Ursolic acid has beneficial actions both topically and internally, and is now used in many cosmetic preparations for its anti-inflammatory, anti-tumor and antimicrobial properties. Many studies reveal ursolic acid's ability to inhibit pathways associated with cancer progression, especially with regard to the metallo-matrix proteases (MMPs), MMP2 and 9.<sup>44-46</sup> Enhanced generation of reactive oxygen species and induction of MMPs appear to be strongly associated with influencing UVA-modulated signal transduction pathways, ultimately leading to photoaging. Ursolic acid may be an effective inhibitor of UVA-modulated signal transduction pathways in human skin cells.<sup>47</sup>

#### MILK THISTLE (SILYBUM MARIANUM)

Silibinin is a flavonolignan compound from the milk thistle plant that possesses strong antioxidant activity and also modulates many molecular changes caused by xenobiotics and ultraviolet radiation to protect the skin. It is known to be non-toxic and possesses strong antioxidant action. Because oxidative stress is one of the major mechanisms for skin aging and dermatologic conditions, the proven efficacy of silibinin as an antioxidant makes it very useful in many dermatologic conditions, as well as skin aging.<sup>48</sup>

#### GREEN TEA

Green tea contains polyphenolic compounds also known as epicatechins, which are antioxidant in nature. Topical application or oral consumption of green tea polyphenols has been shown to inhibit chemical carcinogen- or ultraviolet radiation-induced skin tumorigenesis in different animal models, and studies have shown that green tea extract possesses anti-inflammatory activity. The major and most chemopreventive constituent in green tea responsible for these biochemical or pharmacological effects is epigallocatechin-3-gallate (EGCG). Application of green tea polyphenols to skin has been shown to modulate the biochemical pathways involved in inflammatory responses, cell proliferation and responses of chemical tumor promoters, as well as UV light-induced inflammatory markers of skin inflammation. Topical treatment with EGCG on mouse skin also results in prevention of UVB-induced immunosuppression and oxidative stress.<sup>49</sup>

Many studies have associated EGCG with inhibition of cancers, invasion and metastasis. This is due at least in part to its documented inhibition of MMPs and improved collagen formation. Green tea has been shown in vitro to inhibit melanoma colony formation.<sup>50</sup> Green tea has also recently been shown to have a protective effect when applied topically prior to UVA exposure.<sup>51</sup>

#### GOTU KOLA (CENTELLA ASIATICA) - CENTELLIN™

Gotu kola is a herb native to India that has been documented to aid wound healing in a large number of scientific reports. Centella extracts are recommended for scar management as they stimulate the maturation of scar tissue by increasing the production of type I collagen and reducing inflammation. Gotu kola is also used to treat many connective tissue diseases including lupus, scleroderma, cellulite, varicose veins, mental retardation, hemorrhoids, keloids, chronic urinary tract infections, as well as aiding in the healing of wounds. A variety of phytochemicals, in particular the triterpenoids, were found to possess potent anti-cancer, anti-inflammatory and immunomodulatory effects.<sup>52</sup>

Asiatic acid (AA) is a pentacyclic triterpene found in *Centella asiatica*. AA stimulated collagen I synthesis in skin fibroblasts, increased collagen content, tensile strength, speed of skin epithelialization and rate of wound contraction, and improved cross-linking of granulation tissues in several studies.<sup>53-56</sup> It has also shown promising results against human skin cancer in in vitro studies.<sup>57</sup> Animal studies have shown AA's ability to improve wound healing after burns, which may involve several mechanisms, including antioxidative activity, collagen synthesis and angiogenesis.<sup>58</sup>

*For more information on any of the ingredients listed here, including extensive research or individual monographs compiled by Donnie Yance, please contact a Natura Health Products representative at 1-888-628-8720.*

\* These statements have not been evaluated by the FDA. This product is not intended to diagnose, treat, cure or prevent any disease.



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# SKIN PROTECT REFERENCES

**This specific product has not been tested for any of the potential benefits listed herein. The following references apply to studies and/or research conducted with certain ingredients, or combinations of ingredients used in formulating this product. Such ingredients may not be from the same source or processed in the same way as the ingredients used in this product.**

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