PROTOCOL
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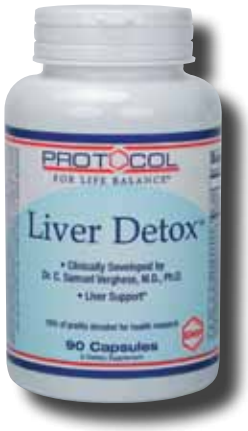
Technical Information Sheet

Detox Support
Cholesterol Support
Liver Detox™



Description

Liver Detox™ is a blend of herbs and nutrients designed to support healthy liver function.* Liver Detox™ contains standardized extracts of Milk Thistle, which has shown in clinical studies to support the hepatic function as measured by standard liver enzyme laboratory tests, as well as Grape Seed (GSE), which is known for its antioxidative properties. In addition, it contains a variety of other herbs traditionally used to promote liver function and bile formation. Also included in the formula are Glutathione (GSH), L-Carnitine, N-Acetyl Cysteine (NAC) and Methionine, which are all vital for liver health. The combination of additional synergistic nutrients and herbs provides comprehensive support for liver function and overall health promotion.

Features & Benefits

- Combination of herbs and nutrients to support healthy liver function.*
- Supports glutathione production.
- Supports antioxidant status and hepatic detoxification processes.
- May promote healthy cholesterol metabolism.*

Suggested Usage

As a dietary supplement, take 3 capsules, 1-2 times daily with food, or as directed by your qualified healthcare practitioner.

Allergen Checklist

Contains no sugar, salt, starch, yeast, wheat, gluten, milk, egg, or preservatives.

Technical Summary

Milk Thistle seed has been used for centuries as a natural remedy for liver and biliary tract complaints.[37] The primary active constituent is silymarin, a flavanolignan complex which includes the four isomers silybin and isosilybin (a 1:1 mixture of diastereoisomers), silychristin and silydianin.[41] A large body of modern research evidence – ranging from experimental to animal and clinical trials – suggests that silymarin may promote liver protection.[4,25-28,32,33,42,43,44,45] Additionally, artichoke leaves, black radish, dandelion, barberry and turmeric root,[37] as well as schisandra, bupleurum, and scute (Baikal Skullcap),[38] have been traditionally used for liver complaints, dyspepsia and promote bile flow. Preclinical research data revealed their choleretic, cholagogic, antioxidative, and liver function promoting properties.[10-15,23,24,31]

The antioxidative and hepatoprotective effects of grape seed extracts have been established in experimental and clinical trials.[46] Glutathione (GSH) has recently been recognized by the scientific community to play an important role in a multitude of cellular processes, including cell differentiation, proliferation, and apoptosis; as a result, disturbances in GSH homeostasis are implicated in the etiology and/or progression of a number of human diseases.[47] In addition to Milk Thistle, glutathione itself, NAC and Methionine have been shown to enhance GSH synthesis in the liver.[6-9,30,46,48,49]

Mechanisms of Action

Silymarin is considered a hepatoprotectant, and reported to inhibit nitric oxide production, increase levels of glutathione in liver and intestines, scavenge free radicals, prevent lipid peroxidation, and stimulate ribosomal RNA polymerase and subsequent protein synthesis.[1,4,25-27,29,35] Research evidence further suggests that it promotes liver protection by (1) altering the structure of outer cell membranes thus preventing penetration of potential hepatotoxins, (2) stimulating the antioxidant status and regenerative ability in the liver, and (3) promoting the formation of new hepatocytes.[4,25-28,32,33,43-46] Scientists revealed that some of silybin's hepatoprotective properties involves the different functions of Kupffer cells, decreasing their production of superoxide anion radicals, nitric oxide and leucotrienes;[43] thus reducing oxidative stress and tissue inflammatory processes. Through this basic action, silymarin and silibimin substantially interfere with Nuclear Factor (NF)-κB–controlled transcriptional processes involved in tissue damage as well as in cellular proliferation.[50]

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Mechanisms of Action *(Continued)*

With regard to the latter, silymarin and silibimin support processes driving cell growth arrest and apoptosis while opposing the ones promoting abnormal cell accumulation. With regard to the former, cellular damage induced by various agents is reduced by silymarin and silibimin and can be estimated by evaluating many different readouts of biological and clinical relevance.[51] Silymarin has been shown to increase GSH production by the intestine, stomach and liver where it is used in detoxification processes.[30] Additionally, it decreases hepatic and mitochondrial oxidation of GSH.[46] GSH plays an essential role in the hepatic detoxification endogenous and exogenous substance.[47] In addition to detoxification, GSH plays a role in other cellular reactions, including, the glyoxalase system, reduction of ribonucleotides to deoxyribonucleotides, regulation of protein and gene expression via thiol:disulfide exchange reactions (Fig. 1.).[47]

The hepatoprotective effects of grape seed extracts have been established in animal trials,[51,52,53] and is primarily attributed to its antioxidative components such as proanthocyanidins, quercetin and stilbene derivative resveratrol.[47]

The hepatoprotective and choleretic activities of artichoke have often been related to its cynarin content. Newer research also attributes these properties to mono- and di-caffeoylquinic acids, which possess high antioxidant capacity.[55]

Clinical Applications

Milk thistle extracts are considered valuable adjuncts for acute or chronic liver inflammatory processes, toxin- and drug-induced hepatitis, as well as for alcohol and non-alcoholic induced liver abnormalities. Some progressive clinics also utilize milk thistle as adjunct to conventional therapies in other etiologies.[3,57] Artichoke has been shown to promote healthy digestive function,[58] including healthy lipid levels,[55] and has been successfully utilized in syndromes with changing bowel movement patterns (IBS)*.[59]

Due to the choleretic, cholagogic activity of milk thistle, artichoke, black radish, and dandelion, LiverDetox™ may assist with healthy cholesterol and lipid metabolism*.

According to its composition of synergistic herbs and nutrients, LiverDetox™ may be beneficial to those seeking to promote liver and digestive health, including detox and general antioxidant support.

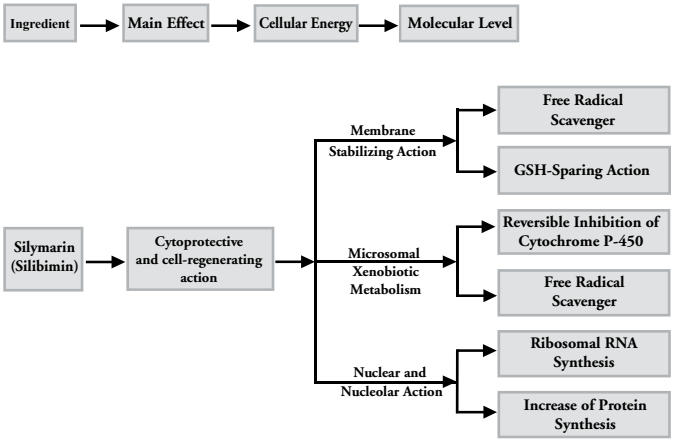

FIGURE 1. Mechanism of Action of Silymarin

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Complementary Products

Consider taking this product in combination with **Ortho Dophilus™ (P2912), Alpha Lipoic Acid (P3042), ProtoClear™ (P5960), Fiber, BioCore® Enhanced Enzymes™ (P2958), Cardio Tri-Plex™ (P1675).**

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Cautions/ Interactions

Laboratory studies indicate that both silymarin and silybinin found in Milk Thistle can inhibit multiple cytochrome P450 enzymes (CYP), and glucuronosyltransferases (UGT).[16-18,31,32] Thus, researchers hypothesize that it may affect the liver's metabolism of alcohol and a variety of medications, including acetominophen, butyrophenones, phenothiazines, phenytoin, halothane, cisplatin and cyclosporine.[2-5,16-18,29,32-36,41-43] While Milk Thistle has been tested in preclinical studies against a variety of drugs,[18,33,34] in the clinic no adverse interaction with pharmacological agents has thus far been identified.[3,4,17,35,35] However, potential pharmacodynamic interactions exist related to Milk Thistle's ability to reduce blood sugar values in Diabetes Type 2 patients.[28] Although no case reports are available, Liver Detox™ should be used with caution in patients receiving hypoglycemic agents.

NAC may also affect the metabolism of several medications, such as ACE inhibitors, antineoplastics like cisplatin and doxorubicin, as well as immunosuppressive drugs.[20-22] In addition, NAC may affect nitroglycerin and isosorbide (two medications commonly used to treat chest pain).[19] Because artichoke and dandelion root may promote bile secretion,[23-24,37-38] caution must be exercised by individuals with obstruction of the bile ducts, gallstones or other serious diseases of the gallbladder, and physician supervision is advised. Additionally, experimental studies suggest that dandelion may possess diuretic, hypoglycemic as well as anti-coagulatory / anti-thrombotic activity;[24,36,37] accordingly, its concomitant use with medications of similar biological action should be avoided or only occur under medical supervision. Dandelion may reduce the effects of the antibiotic ciprofloxacin (Cipro®) due to reduced absorption of the drug. In theory, dandelion may reduce the absorption of other drugs taken at the same time while increasing the effects (or side effects) of certain drugs, including digoxin (Lanoxin®), diuretics, hypoglycemic agents, lithium, or corticosteroids such as prednisone.[38]

Animal studies indicate that bupleurum and scute may possess immunomodulatory properties;[39,40] accordingly, its combined use with immunosuppressive drugs such as azathioprine, basiliximab, cyclosporine, daclizumab, muromonab-CD3, mycophenolate, tacrolimus, sirolimus, prednisone, and other corticosteroids (glucocorticoids) should be avoided.

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