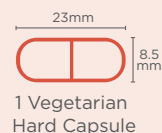


LV-GB Complex

A unique formula aimed at maintaining the health and function of the liver whilst supporting bile production and secretion



OVERVIEW

- > Contains standardised extracts of both St. Mary's Thistle and Globe Artichoke at therapeutic doses.
- > St. Mary's Thistle, Schisandra, Rosemary and Inositol support the health and function of the liver.
- > Globe Artichoke, beetroot and taurine are involved in bile production and secretion.
- > Also contains calcium saccharate (calcium d-glucarate) as an excipient ingredient to support liver function via phase 2 glucuronidation pathways.
- > The unique blend of herbs and nutrients supports liver function by maintaining phase one, two and three detox pathways.
- > Schisandra supports various functions of the liver including protein and glycogen synthesis.
- > Both St Mary's Thistle and Globe Artichoke have been used traditionally in Western Herbal medicine as hepatoprotectant herbs.



No Added Gluten



No Added Soy



No Added Dairy



No Added Nuts



Vegan Friendly

Active Ingredients (per vegetarian hard capsule)	
<i>Silybum marianum</i> extract dry concentrate	131.25 mg
From min dry fruit	10.5 g
Standardised to 105 mg silymarin	
Standardised to 26.25 mg silybin	
<i>Cynara scolymus</i> extract dry concentrate	160 mg
From min. dry leaf	480 mg
Standardised to 8 mg caffeoylquinic acid calc. as cynarin	
<i>Schisandra chinensis</i> extract dry concentrate	30 mg
From dry fruit	750 mg
<i>Rosmarinus officinalis</i> extract dry concentrate	25 mg
From dry leaf	500 mg
<i>Beta vulgaris</i> extract dry concentrate	11.25 mg
From dry root	112.5 mg
Taurine	225 mg
Inositol	125 mg

Pack Size	120
Servings Per Pack	30

Excipients
Colloidal anhydrous silica, calcium saccharate, magnesium stearate, maltodextrin, microcrystalline cellulose, hypromellose, silica dioxide, purified water.

Directions for Use
Adults: Take 4 capsules daily with a large glass of water, or as directed by your healthcare professional.

Allergen Information
No added gluten, dairy, soy, lactose, nuts.



Prescribing Information

- Globe Artichoke can cause contact dermatitis in those allergic to plants in the asteraceae/compositae family.
- Rosemary may cause uterine stimulation. Do not use when pregnant.

Warnings

Do not use this product if you have a bile duct obstruction.

Designed and packed in Australia from imported ingredients.

EDUCATION

The liver is a complex and vital organ that makes up around 2% of our body weight and receives nutrient rich blood from the stomach, intestines, pancreas and spleen via the portal vein and oxygenated blood from the aorta via the hepatic artery.^{1,4} It holds around 13% of the body's total blood volume at any given time.³ It functions in a number of critical physiological processes including detoxification, digestion, metabolism & energy production, immunity, macro and micronutrient storage and metabolism, endocrine signalling, lipid and cholesterol maintenance, glycogen production and storage, blood coagulation homeostasis, heme breakdown and the synthesis of bile, hormones, amino acids and other compounds vital for cellular functioning and the sustenance of life.^{1,2}

The most well-known function of the liver is that of detoxification which occurs in three phases - two of them biochemical, and one mechanical.⁴⁻⁶

- **Phase one (functionalisation):** The addition of a reactive oxygen group such as hydroxyl, carboxyl or amino group to form a reactive site on the toxic compound in readiness for phase two. The addition of this group can render the compound highly reactive and can contribute to tissue damage and subsequent disease or adverse drug events if phase two doesn't begin immediately or is dysfunctional.
- **Phase two (conjugation):** The addition of a water-soluble group to the reactive site created in phase one. The water-soluble group can include glucuronic acid, sulfate, glutathione, amino acids, or an acetyl or methyl group. This increases the hydrophilicity enabling it to be safely excreted via the bile or urine
- **Phase three (elimination):** includes the excretion of the end product either via the bowel under the influence of peristalsis, healthy microbiota and adequate stool bulk or the kidneys (in urine).

A fine balance between phases one and two needs to be maintained as the metabolites produced during phase one

can be more toxic and reactive than the starting compound. If phase two isn't initiated immediately or is initiated poorly or dysfunctionally, tissue damage and disease can ensue.⁶

Silybum marianum

Traditionally used in Western Herbal Medicine as a hepatoprotective, St Mary's Thistle now enjoys a reputation as one of the most well used and loved herbs to support the health and function of the liver.

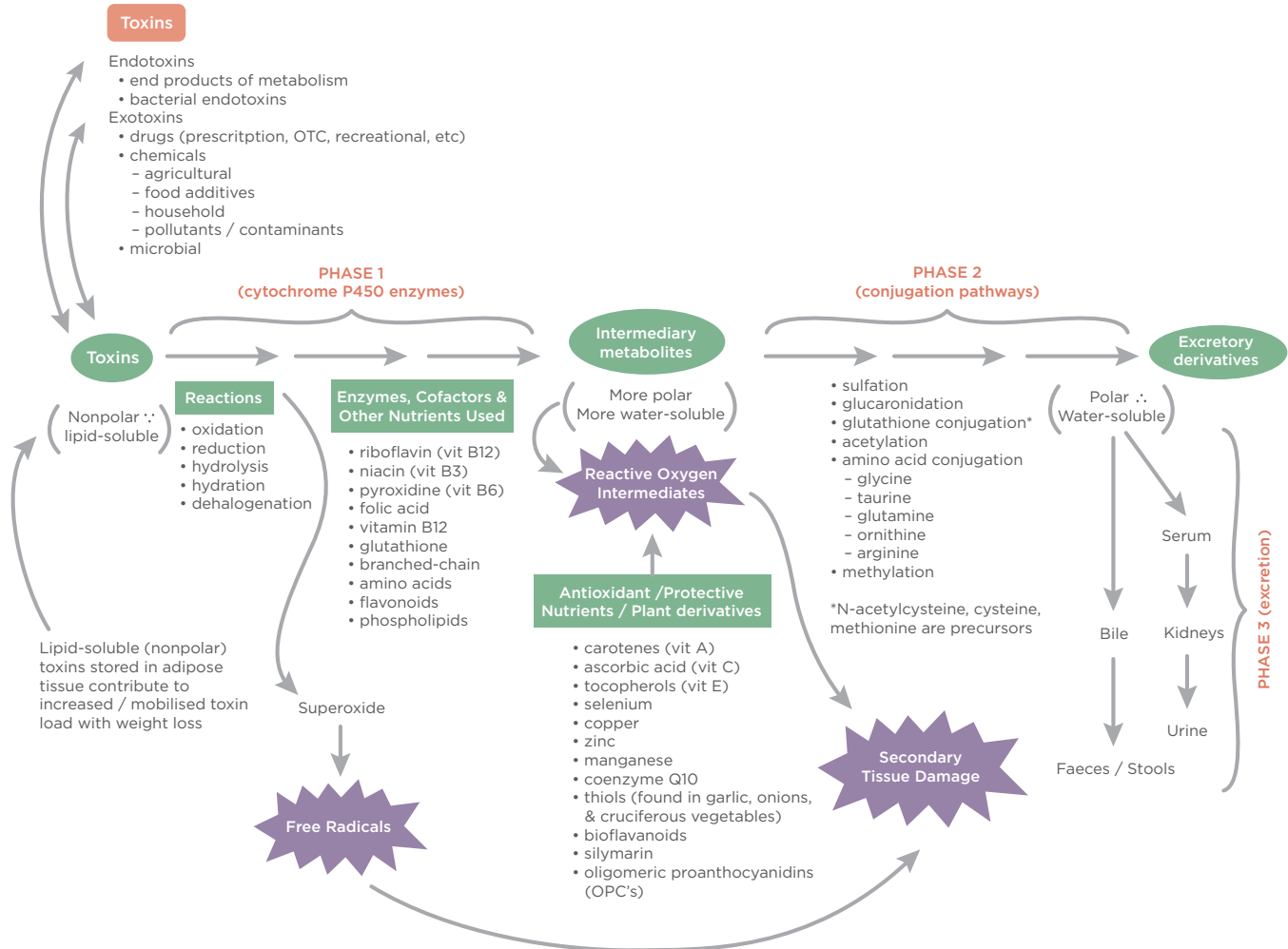
The therapeutic activity of St Mary's Thistle can be attributed to the flavonolignan compound silymarin. Research has suggested that standardisation to between 70-80% of this component is best to achieve therapeutic effects.

The term "silymarin" actually refers to 7 flavonolignan compounds: silybin A, silybin B, isosilybin A, isosilybin B, silychristin, isosilychristin, and silydianin. Some extracts may also contain the flavonoid taxifolin.

St Mary's Thistle supports the healthy functioning of the liver via the induction of both phase one and two detoxification pathways, therefore keeping the two vital phases balanced. Research into this herb is extensive and has identified the following functions that contribute to its activity in supporting liver health:^{4,6-9}

- Prevents uptake of toxins and pathogens by stabilisation of cell membranes. Silybinin and silymarin are incorporated into the outer cell membrane thereby altering its structure. In doing so, these compounds stabilise the membranes and regulate their permeability and subsequent intracellular contents. They prevent the penetration of toxins into the hepatocytes, providing a "toxin blockade".
- Aids hepatic repair and regeneration by enhancing ribosomal RNA synthesis (via stimulating nucleolar polymerase A) and cellular proliferation.
- Improves intracellular glutathione concentration.
- Increases the proliferation of Kupffer cells.

Figure 1: Phases and Pathways of Liver Detoxification and Supportive Nutrients.



Cynara scolymus

The chlorogenic acids (cynarin and caffeoylquinic acid) found in Globe Artichoke also support the healthy functioning of both phase one and two detoxification pathways in the liver. In addition to this, Globe Artichoke is seen as the herb of choice in protocols targeting bile production and the gall bladder as Globe Artichoke is seen as one of the most paramount choleric and cholagogue herbs available to practitioners. Effects on bile secretion occurs an hour after the administration of a single dose.⁷ The excretion of cholesterol and other solids, as well as increases in faecal bile salts have been shown in both pre-clinical and clinical studies. As a result of this, conditions requiring either the maintenance or increase of choleresis may benefit from the administration of globe artichoke.⁸

It is also seen as a trophorestorative herb that can protect the integrity of bile canalicular membrane from chemically induced distortions. It does this by increasing glutathione peroxidase activity. This activity is also able to protect hepatocytes from oxidative stress,⁷ and its capacity to regenerate hepatocytes makes it the ideal partner to St Mary's Thistle.⁸

Beta vulgaris

Beetroot is a valuable source of the constituent compounds betaine and betanin. These components also have supportive effects on both liver health and function. They do this by reducing fatty infiltration of hepatocytes, improving glutathione status, supporting phase one and two detox pathways, thinning the bile and supporting gall bladder function.¹⁰⁻¹³

Schisandra chinensis

Historically used in the Chinese medicinal paradigm, Schisandra is considered a warming herb that supports and protects many aspects of liver function. The main constituents that show activity are the lignan components. The lignans have been shown to support hepatic functions such as glycogen and protein synthesis, and enzymatic activity during both phase one and two detox pathways. They also support liver health by assisting the regeneration of hepatocytes and inhibiting lipid peroxidation in liver tissues.^{4,14}

Rosmarinus officinalis

As mentioned above, it is necessary to maintain a balance between phase one and two detox pathways to maintain health. Phase two needs to “keep up” with phase one in order to prevent the build-up of the potentially toxic compounds produced during phase one.

Rosemary provides a valuable contribution to formulas aimed at supporting liver health and function as it has the ability to induce several enzymes involved in phase two pathways, helping to keep balance between the two detox systems.⁴

Taurine

Found in food sources such as shellfish, meat, eggs and seaweed, taurine is necessary to produce bile through bile acid conjugation. Taurine is preferentially conjugated with bile acids to produce taurocholic acid.⁸

Bile acid synthesis is a complicated process that involves several enzymes that convert cholesterol to a water-soluble bile acid. Bile acid molecules are then conjugated with either glycine or taurine to create a stronger acid before being excreted into the small intestine.⁹ It is also a co-factor in phase two conjugation systems.⁵ Further to this, as bile (a natural laxative) helps to support phase 3 detoxification, it may be said that taurine contributes to the functioning of phase three via this function as well.⁴

Inositol

The ways in which Inositol supports the health of the liver is via its protective effects. Preclinical studies show that inositol may help support glutathione levels in hepatocytes. It also has a lipotropic action and is able to mobilise lipid compounds out of the liver and intestines.^{15,16}

References supplied on request.

Designs for Health Quality Guarantee

Designs for Health medicines that are listed on the Australian Register of Therapeutic Goods will display an AUSTL number on the label. Listed medicines in Australia need to be manufactured according to legislated standards set out in Therapeutic Goods Order 101. TGO101 legislation sets out minimum quality standards for medicines supplied in Australia that display an AUSTL number. It mandates testing for:

- Impurities such as heavy metals (including lead, mercury, cadmium and arsenic), pesticides and residual solvents.
- Dissolution (to ensure the capsule will dissolve once taken).
- Uniformity (to ensure that every capsule is the same).

Final assay testing is also performed to ensure that what we have on the label is in each capsule, and microbiological testing is performed to ensure that no microbial contamination has occurred during the encapsulation and packing process.