

Yummy Tummy™



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Yummy Tummy™ provides a synergistic blend of herbs which buffer the neurological reactions to foods for those with dysbiosis and resulting neuroinflammation. The synergistic blend of herbs in Yummy Tummy™ encourage a balanced immune and mast cell response, while supporting healthy digestion. Yummy Tummy™ is best used prior to meals.

The neuroinflammation associated with complex chronic conditions, such as PANDAS and PANS, can interrupt neuronal processes which regulate basic bodily functions, including the sense of hunger or satiety, vagal nerve function, and peristalsis.

The appetite-regulating centers of the brain in those with chronic neuroinflammation may become disrupted, interrupting the message of hunger, even when in a calorie deficit. Additionally, if the brain barrier is compromised, especially in those with dysbiosis, the natural increase in gut-derived endotoxins from eating can more easily cross the barrier to the brain. Microglia and mast cells get stimulated, which further inflame an already inflamed brain. The brain will tell the body to stop eating in order to minimize the damage.

Dysphagia is another possible issue with neuroinflammation, creating fears of eating certain foods. As neuroinflammation is addressed, the complex neurological process involved in swallowing are allowed to function normally. Yummy Tummy™ was formulated to address the many factors impeding a healthy appetite by managing neuroinflammation.

Specific herbs in this deeply impactful formula have activity in the restoring the gut-brain axis by restoring the gut barrier, microbiome, and intestinal innate immunity. Blood-brain barrier repair was also considered, through activity on the astrocytes, which are involved in the integrity of the blood-brain barrier.

Gotu Kola

Gotu kola, or *Centella asiatica*, is a psychoactive medicinal herb with immense therapeutic potential. It's traditionally used in many parts of Asia as a tonic for the brain and nervous system, and is said to minimize the impacts of excessive worry and chronic stress. As a powerful antioxidant, gotu kola attenuates oxidative stress by significantly increased anti-oxidant enzymes, like superoxide dismutase, catalase and glutathione peroxidase, and antioxidants like glutathione (GSH) and ascorbic acid. Gotu kola contains an abundance of triterpenoid saponins, categorized as centellosides. Animal studies find that centellosides demonstrate high capability to cross the blood-brain barrier, making them particularly beneficial for neuroinflammation.

Supplement Facts	
Serving Size 1/4 tsp. (1.25mL)	
Servings Per Container 48	
Amount Per Serving	% Daily Value
Proprietary blend:	290mg h/w equivalence*
Gotu Kola aerial (Dried/Fresh <i>Centella asiatica</i>)	
Chinese Skullcap root (<i>Scutellaria baicalensis</i>)	
Perilla leaf (<i>Perilla frutescens</i>)	
Feverfew aerial (Fresh <i>Tanacetum parthenium</i>)	
Chinese Sarsaparilla root (<i>Smilax glabra</i>)	
Oregon Grape root (<i>Mahonia aquifolium</i>)	
Brahmi aerial (<i>Bacopa monnieri</i>)	
Vanilla pod (<i>Vanilla planifolia</i>)	
*Daily Value not established.	

Free from alcohol, gluten, dairy, soy, GMOs.

Recommended Use

Child-safe dose (50 lb): ¼ tsp three times daily, before meals, or as directed by your health care practitioner. Adjust for others using a weight-adjusted dose.

Gotu kola's triterpenoids activate anti-neuroinflammatory mechanisms by inhibiting lipopolysaccharide (LPS)-induced microglial inflammation, a targeted benefit for those with dysbiosis, where eating causes a heightened release of LPS endotoxins. Other neuroprotective mechanisms include preserving glutathione, protecting against dopamine and glutamate neurotoxicity, and suppressing neuroinflammation in microglia via modulation of the Sirt1/NF-κB signaling pathway — a pathway dysregulated by mold mycotoxin exposure.,

Gotu kola has a restorative impact on the mucosa barrier and gut microbiota homeostasis. This may be related to its induction of intestinal T-regulator cells, which consequently has an anti-arthritis effect.

Chinese Skullcap

Chinese skullcap, or *Scutellaria baicalensis*, is referred to as the golden herb of the garden. It's an important traditional Chinese medicine which is widely distributed around the world. Flavones such as baicalin and wogonoside are the major bioactive compounds which have been reported to have various pharmacological functions, including anti-cancer, hepatoprotection, antibacterial and antiviral, antioxidant, anticonvulsant and neuroprotective effects. Chinese skullcap is a purinergic G protein-coupled receptor antagonist, making it helpful in turning off purinergic signaling to address a dysfunctional cell-danger response.

Chinese skullcap is soothing to the nervous system, usually without causing drowsiness. It significantly reduces secretion of inflammatory cytokines from stimulated microglia, resulting in a greater sense of calm. Chinese skullcap's neuroprotective action includes protecting against dopamine neurotoxicity, inhibiting lipopolysaccharide (LPS)-stimulated microglia, reducing inflammation, and regulating the T-cell balance. It regulates allergic responses by maintaining the Th1/Th2 immune balance, which is important for mast cell-related conditions. Baicalin also suppresses the release of histamine from mast cells.

In addition to its antimicrobial activity, Chinese skullcap alleviates intestinal mucosal barrier damage by inhibiting inflammation and modulating the gut microbiota to favor more beneficial species.

Perilla

Perilla's role in the blend is primarily to manage the neuroinflammation triggering components. It also has a protective effect on dopaminergic neurons, the target of autoimmune attack in PANDAS and PANS, with an effect of suppressing dopaminergic neuronal loss and subsequent behavioral dysfunction. Mouse studies suggest that perilla aldehydes had favorable alterations in serum cytokines and depressive-like behavior, and inhaled perilla aldehydes showed antidepressant-like activity through olfactory nervous function.

Perilla is rich in anti-inflammatory flavones, such as apigenin and luteolin, as well as rosmarinic acid. It has an inhibitory effect on mast cell-mediated immediate-type allergic reactions and IgE-mediated immediate hypersensitivity reactions. Studies show that perilla extract reduced the plasma histamine levels in a dose-dependent manner. In addition, it down-modulates the Th17 response.

Made without the use of alcohol. Free from added sweeteners.

Taste-tested by both kids and adults. Glycerin provides a pleasantly sweet taste.

Additionally, brahmi's potent phytochemicals have activity against oral *Staphylococcus aureus*.

Feverfew

Though many are familiar with feverfew as a “head” remedy, used for headaches and migraines, feverfew approaches vagal dysfunction primarily from the bottom up, from the gut to the brain. The bidirectional cross-talk between the brain and gut is an often overlooked contributor to vagal dysfunction. Feverfew ameliorates colon inflammation through regulating the T-Regulator-Th17 balance in a gut microbiota-dependent manner, meaning the higher the dose and the more supported the gut microbiome, the stronger the effect. The plant’s major component, parthenolide, displayed reduction of LPS-stimulated microglial activation by inhibition of proinflammatory agents.

However, make no mistake, feverfew does exert CNS effects as well, being shown to be effective in reducing prostaglandin release and IL-1 β gene expression, while increasing gene expression of brain-derived neurotrophic factor (BDNF). Additionally, parthenolide decreases extracellular dopamine levels, having an overall calming effect.

Chinese Sarsaparilla

Chinese sarsaparilla, otherwise known as *Smilax glabra*, is an important traditional Chinese medicine used extensively worldwide for its marked pharmacological activities, such as anti-infective, anti-cancer, anti-inflammatory, antioxidant, cardiovascular protection, and hepatoprotection. Its role in this formula is gut-brain integrity, as an immunoregulator and endotoxin binder. Its major components are flavonoids and flavonoid glycosides, phenolic acids, and steroids, with astilbin being the most widely studied. When binding endotoxin, astilbin has an immunoregulatory role, promoting IL-10-producing B cells, the major subset of regulatory B cells (Bregs) that inhibit inflammation and autoimmune diseases.

Animal studies report that the flavonoids from Chinese sarsaparilla significantly inhibit the secretion of the inflammatory cytokines interleukin-1 β (IL-1 β), interleukin-6 (IL-6), and NO (nitric oxide), and the protein expression of NF- κ B in LPS-stimulated macrophages. They reduce the occurrence of astrocyte-mediated neuroinflammation, the glial cells which maintain the integrity of the blood-brain barrier.

Polysaccharides from Chinese sarsaparilla mitigate intestinal mucosal damage by therapeutically restoring the interactions between the gut microbiota and innate immune functions. In particular, they increase the number of goblet cells, reduce the proportion of apoptotic cells, improve the differentiation of gut tight junction proteins, and enhance mucin production in the gut epithelial layer.

Oat Seed

Oregon grape goes by the latin name *Berberis aquifolium*. Oregon grape is useful in this application by supporting people whose moods change with blood sugar fluctuations, and who have concomitant digestive issues, such as leaky gut, food allergies, and abdominal pain. The active component of Oregon grape is the isoquinoline alkaloid called berberine, which has broad-spectrum antibacterial activity, including moderate activity against *Streptococcus pyogenes*. Berberine is a metabolic stabilizer, regulating glycometabolism and lipid metabolism. It reduces histamine by suppressing mast cell-mediated allergic responses by regulating Fc ϵ RI-mediated and MAPK signaling. Berberine-induced bioactive metabolites of the gut microbiota, such as butyrate, improve energy metabolism.

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ed, or milky oats (*Avena sativa*), are well-studied neurocognitive enhancers with a calming nervine possibly owing to its studied effect of increasing cerebral blood flow.

Berberine has been reported to have neuroprotective effects beyond modulation of the microbiota-gut-brain axis. Animal studies report inhibition of the release of glutamate in nerve terminals and protection against glutamate-induced neural cell injury. The mechanism involves reduction of reactive oxygen species (ROS) generation, lipid peroxidation, and DNA fragmentation, while improving glutathione content and superoxide dismutase (SOD) activity in glutamate-injured cells. It acts as an antagonist at both dopamine D1 and D2 receptors, the same receptors under attack in PANDAS and PANS, with findings suggesting that dopamine receptor antagonists suppress innate and adaptive immune responses, providing a foundation for their use in combatting inflammatory diseases.

Brahmi

The use of brahmi, or *Bacopa monnieri*, goes back centuries in traditional Ayurvedic medicine, where it's touted as a brain tonic and cognitive aid. It's said to help sharpen the mind and the intellect. That claim is bearing out as several randomized, double-blind, placebo-controlled trials have substantiated brahmi's nootropic utility in humans. Brahmi's triterpenoid saponins successfully establish a healthy antioxidant environment in various tissues especially in the liver and brain.

Current evidence suggests that brahmi acts by multiple mechanisms, including antioxidant neuroprotection, acetylcholinesterase inhibition and/or choline acetyltransferase activation, β -amyloid reduction, increased cerebral blood flow, and neurotransmitter modulation, with subsequent preservation of dopamine D1 and D2 receptors. Brahmi inhibits pro-inflammatory cytokine release from microglial cells and inhibits enzymes associated with inflammation in the brain, thus limiting inflammation in the central nervous system.

For this formulation, Brahmi was selected for its neuroprotective potential against dopamine receptor dysfunction during hypoglycemic episodes, a useful mechanism for conditions of low blood glucose such as food restricting.

Vanilla

Vanilla is featured as an appetite enhancer and also for its neurocognitive appeal. The well-documented appetite-stimulating effect of vanilla is thought to occur via stimulation of olfactory receptors, observed with intraperitoneal administration in animals, suggesting that ingestion is just as effective as inhalation at stimulating appetite. Vanillin, a primary component of vanilla bean extract, has anti-inflammatory, anticancer, and antitumor properties, and exhibits neuroprotective effects on multiple neurological disorders and neuropathophysiological conditions. Vanillin has anti-neuroinflammatory effects through the regulation of inflammatory factors and NF- κ B signaling in LPS-stimulated microglia.

Therapeutic Differences by Composition



Glycerin was chosen as the extraction menstruum for the herbs in this formula for more than its alcohol-free benefits. Whereas ethanol has 2-carbon atoms and only one hydroxyl group to share, glycerin has 3-carbon atoms and three hydroxyl groups to share, making it superior for extracting more therapeutic properties from the herbs, including higher concentrations of polyphenols and flavonoids.

In addition, glycerol aquaporins within the fatty acid backbone of the cell membrane preferentially allow glycerins through the cell membrane resulting in maximum absorption and bioavailability.

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