



## LIPOSOMAL GABA WITH L-THEANINE

HELPS TO TEMPORARILY PROMOTE RELAXATION

50 ML LIQUID | NPN80081050 | LPONEU-CN

Liposomal GABA with L-Theanine features GABA (gamma-aminobutyric acid) and L-theanine, both well regarded for promoting mental and emotional calm without impairing focus and attention.

### GABA

GABA is a naturally occurring amino acid in the brain and is a major inhibitory neurotransmitter in the central nervous system.<sup>1</sup> Being an inhibitory neurotransmitter, GABA blocks nerve impulses, slowing down the activity of nerve cells and preventing them from over-firing. GABA serves as a critical calming agent for the body, helping to combat stress. Supplementation with GABA may be of benefit in helping to cope with stressful situations, whether they arise from chronic daily stress or short-lived, acute or extreme stress.

The brain synthesizes GABA from glutamate, an excitatory neurotransmitter. These two neurotransmitters work together in a system of checks and balances. When this communication system breaks down, brain function becomes affected. GABA levels in the body may decrease in stressful situations, which can tip this delicate system out of balance.

GABA's role as an inhibitory neurotransmitter is paramount. A study of over 1200 students in China looked at the association between behavioral problems and neurotransmitter deficiencies in adolescents. It was determined that deficiencies in neurotransmitters such as GABA may cause behavioral and mental/emotional issues.

Brain waves are analyzed in order to learn how the brain reacts to real life situations. Alpha waves are produced during meditation and anytime the body is relaxed but alert. Beta waves, on the other hand, are seen in situations of high stress and when there's difficulty focusing and concentrating. A small EEG study showed that one hour after oral GABA administration, alpha waves were increased while beta waves were decreased, indicating that GABA may help to induce relaxation.<sup>3</sup> It is believed that GABA supplementation elicits these results by activating the parasympathetic nervous system, a division of the autonomic nervous system responsible for a variety of involuntary bodily processes involved in relaxation ("rest and digest," the balance to the sympathetic nervous system's "fight or flight").

### GABA FOR ACADEMICS & ATHLETICS

Owing to GABA's effect on the parasympathetic nervous system and its ability to facilitate increased production of alpha brain waves, supplementation with GABA may be beneficial in situations requiring a relaxed state of mind. A relaxed mind may allow for clear thinking and better focus and concentration. In this respect, GABA has been found to be of benefit in academics, in helping to improve learning capacity. GABA was given to elementary school students in Japan, to examine its relaxing effect and its potential to improve students' learning. Results showed that GABA suppressed the secretion of CgA (salivary chromogranin A; secreted in times of psychological stress), demonstrating reduced stress at the time of learning. An increased accuracy rate of testing was also observed, as well as a significant reduction in tension toward learning (as measured by a Manifest Anxiety Scale). Researchers concluded that GABA was effective in improving students' learning efficiency and in helping to improve students' test results. (Unpublished data provided by Pharma Foods International Co. Ltd.)

This concept also holds true with respect to athletic performance. Athletes refer to this state of mind as being "in the zone," where their ability to relax and focus leads to a greater level of concentration on their performance and a reduction in pre-competition nervousness.

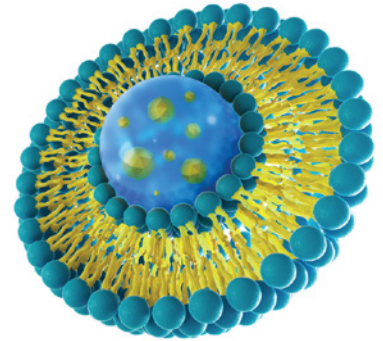
For details on additional uses for GABA, including promoting restful sleep, see the Designs for Health tech sheet for PharmaGABA™.

## WHO MAY BENEFIT FROM LIPOSOMAL GABA WITH L-THEANINE

- Those with increased levels of stress and anxiety
- Individuals who are easily agitated and frustrated
- Conditions associated with hypervigilance and/or central sensitization
- Those who need help focusing during stressful events, such as academic tests or athletic pursuits

## L-THEANINE

L-Theanine is an amino acid found mainly in tea (especially green tea) and various fungi. It crosses the blood brain barrier and is known to block the binding of glutamic acid to glutamate receptors in the brain “and has been considered to cause anti-stress effects by inhibiting cortical neuron excitation.”<sup>5</sup> Studies show that orally administered L-theanine reduces agitation and attenuates blood-pressure increases in healthy adults under conditions of physical or psychological stress.<sup>5</sup> Compared to placebo, L-theanine reduced heart rate and salivary immunoglobulin A responses during an acute stress task. Researchers attributed these effects to an attenuation of sympathetic nervous activation.<sup>6</sup> Animal studies suggest that L-theanine increases brain levels of serotonin, dopamine and GABA.<sup>7</sup> Human EEG studies show “L-theanine significantly increases activity in the alpha frequency band which indicates that it relaxes the mind without inducing drowsiness,”<sup>8</sup> making it a logical pairing with GABA.



STRUCTURE OF A LIPOSOME

## ADDITIONAL ROLES FOR GABA AND THEANINE

Some of the pharmaceutical agents (e.g., gabapentin, pregabalin) frequently used for conditions associated with hypervigilance and/or central sensitization—such as fibromyalgia, insomnia, etc.—are GABA agonists and may also increase the concentration and rate of synthesis of endogenous GABA.<sup>9-11</sup> Providing GABA itself in a bioavailable form may be beneficial for individuals with these conditions. Diminished GABA levels and altered GABAergic signaling may play a role in gastrointestinal disorders associated with high levels of stress and hypervigilance, such as irritable bladder or bowel conditions. GABA receptors are found within the GI tract, and various GABAergic drugs have been investigated for their positive effects on stress-related GI problems.<sup>12,13</sup>

GABA-centric therapies may hold promise for inflammatory, neuroinflammatory and autoimmune conditions.<sup>14-17</sup> According to researchers, “Persistent neuroinflammation has been recognised as a major pathological component of virtually all neurodegenerative diseases and has also been a focus of research into the pathology underlying psychiatric disorders....Accumulating evidence suggests that GABAergic activities are closely bound to immune processes and signals, and thus the GABAergic neurotransmitter system might represent an important therapeutic target in modulating neuroinflammation.”<sup>15</sup>

More research is needed, but mechanistic explanations support a potential therapeutic role for L-theanine in anxiety and panic disorders, obsessive compulsive disorder (OCD), schizophrenia, ADHD and more.<sup>19</sup>

## WHAT ARE LIPOSOMES?

Liposomes are spheres made of phospholipids—the primary building blocks of cell membranes. Owing to this structure, liposomes bond easily with cell membranes to facilitate intracellular delivery of their nutrient cargo. Thanks to this enhanced delivery and absorption, nutrients delivered in liposomal form at lower doses may have equal or greater efficacy than higher doses provided in forms that are less bioavailable.

Designs for Health’s Liposomal GABA with L-Theanine employs liposome particles that are 50-100nm in size, in contrast to 200-600nm particles that are more commonly available from other manufacturers. The smaller sized particles result in increased oral and cellular uptake and faster transmucosal absorption in the mouth. In fact, it is recommended to hold the product in the mouth for 30 seconds before swallowing to take advantage of this effective route of absorption. Additionally, clearance of these particles from the bloodstream (via the liver and spleen) is inversely related to size: the smallest particles circulate the longest, increasing the likelihood of absorption at their target tissues. Note that the phospholipids used in this product are derived from sunflower lecithin (soy-free, non-GMO material).

## BENEFITS OF LIPOSOMAL DELIVERY

- Superior absorption and intracellular delivery of nutrients
- Phospholipid structure allows for effective delivery of compounds with different solubilities carried within the same particle (e.g., water- and lipid-soluble compounds)
- Liposomes penetrate the blood-brain barrier, an obstacle for other various formulations
- While there is an opportunity for quick absorption in the mouth, liposomes also survive the acidic environment of the stomach, ensuring intestinal uptake and delivery to the lymphatic system
- Liquid liposomal formulations are convenient for those who prefer to swallow fewer pills; also allow for easy dosing

## Medicinal Ingredients (per 2 ml/4 pumps):

GABA (Gamma Amino Butyric Acid) .....	250 mg
Phosphatidylcholine (from purified sunflower seed lecithin) .....	134 mg
L-Theanine.....	100 mg

**Non-Medicinal Ingredients:** Water, glycerin, ethanol, vitamin E (as tocopherols and natural mixed tocopherols). **Recommended Dose:** Adults: Take 2-4 pumps by mouth as needed. Hold 30 seconds before swallowing. Repeat to desired dosage or as directed by a healthcare professional. Take on an empty stomach, at least 10 minutes before meals. Use within 60 days of opening.

## REFERENCES

For a list of references cited in this document, please visit: [http://catalog.designsforhealth.com/assets/itemresources/LiposomalNeuroCalm\\_References.pdf](http://catalog.designsforhealth.com/assets/itemresources/LiposomalNeuroCalm_References.pdf)



designs for health®

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GABA (gamma-aminobutyric acid) and L-theanine are both well-regarded for promoting mental and emotional calm without impairing focus and attention.

### GABA

GABA is the main inhibitory or calming neurotransmitter in the central nervous system. Being an inhibitory neurotransmitter, GABA slows down the activity of nerve cells and prevents them from over-firing. GABA is a critical calming agent for the body, helping to combat stress and occasional anxious feelings. The body produces GABA, but additional supplementation may be helpful for those with difficulty coping with stressful situations, whether they arise from chronic daily stress or from short-lived periods of increased stress.

Owing to its role in supporting mental calm without bringing drowsiness, GABA may be beneficial for promoting mental clarity, focus and concentration during academic or athletic endeavors. (Athletes refer to this as being “in the zone.”) Supplementation with GABA may help support the parasympathetic nervous system, which is responsible for a variety of involuntary bodily processes involved in relaxation—the “rest and digest” part of the nervous system, which balances the sympathetic nervous system’s “fight or flight” activity.

### L-THEANINE

L-Theanine is an amino acid found mainly in tea (especially green tea) and various fungi. It crosses the blood brain barrier and is known to promote calm and a healthy response to stress. L-theanine is a natural pairing with GABA, as it also lessens over-excitation of neurons in the brain, reduces sympathetic nervous system activity, and promotes mental relaxation without inducing drowsiness. While neither GABA nor L-theanine induce daytime sleepiness, taking them in the evening may help promote restful sleep as a result of calming the mind.

### WHAT ARE LIPOSOMES?

Liposomes are spheres made of phospholipids—the same primary building blocks of cell membranes. Owing to this structure, liposomes bond easily with cell membranes to deliver their nutrient cargo (in this case, GABA and L-theanine). Liposomes are extremely tiny particles, which allows for fast absorption, starting in the mouth.

### BENEFITS OF LIPOSOMAL TECHNOLOGY

- Rapid uptake, starting in the mouth
- Effective, efficient absorption in the body

**Recommended Dose:** Adults: Take 2-4 pumps by mouth as needed. Hold 30 seconds before swallowing. Repeat to desired dosage or as directed by a healthcare professional. Take on an empty stomach, at least 10 minutes before meals. Use within 60 days of opening.