

GABA-T SAP

Science-based neurotransmitter support for stress and anxiety*

γ -Aminobutyric acid (GABA) is a major neurotransmitter used in the human central nervous system.* As the body's most important and abundant inhibitory neurotransmitter, GABA acts to mitigate the overproduction of stimulatory neurotransmitters.* Stimulation of GABA receptors leads to relaxation as well as to the induction and enhancement of sleep.* L-Theanine is a known constituent of green tea and has been shown to cross the blood-brain barrier, leading to increased α -wave activity, associated with relaxation responses via GABA receptor stimulation.* L-Theanine has been shown to mitigate cortisol production and mitigates carbohydrate cravings.*

SUPPLEMENT FACTS

Serving Size: 1 Capsule		Servings: 60
	Amount Per Serving	% Daily Value
<i>gamma</i> -Aminobutyric acid (GABA)	300 mg	**
L-Theanine	150 mg	**

**Daily Value not established

Other ingredients: Vegetable magnesium stearate and silicon dioxide in a vegetable capsule composed of vegetable hypromellose and purified water.

This product is non-GMO and vegan friendly.

Contains no: Gluten, soy, wheat, corn, eggs, dairy, yeast, citrus, preservatives, artificial flavor or color, starch, or sugar.

GABA-T SAP contains 60 vegetable capsules per bottle.

DIRECTIONS FOR USE

Adults: Take 1 capsule daily or as directed by your healthcare practitioner. Consult a healthcare practitioner for use beyond 3 weeks.

INDICATIONS

GABA-T SAP may:

- Be used to support normal stress, anxiety and coping mechanisms.*
- Alleviate symptoms of anxiety and induce relaxation responses.*
- Aid in the enhancement of sleep quality and the treatment of insomnia.*
- Have therapeutic benefit in the treatment of depression and mood disorders.*

SAFETY

GABA and L-theanine, the components of **GABA-T SAP**, are generally well tolerated and safe for oral administration, with no reported side effects. While research has shown that GABA and L-theanine both induce relaxation responses, both subjectively and objectively, they have not been shown to be sedative.

Due to the lack of research involving the oral administration of GABA and L-theanine in pregnancy, the use of **GABA-T SAP** should be considered cautioned in pregnant women.

PURITY, CLEANLINESS, AND STABILITY

All ingredients listed for all **GABA-T SAP** lot numbers have been tested by a third-party laboratory for identity, potency, and purity.

* These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

Scientific Advisory Panel (SAP):
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γ-AMINOBUTYRIC ACID (GABA)

γ-Aminobutyric acid (GABA) is the major inhibitory neurotransmitter in the central nervous system (CNS). Modulating the effects of stimulatory neurotransmitters, in particular dopamine and serotonin,^[5] GABA is often considered the “brake” of the CNS, inhibiting symptoms of anxiety, irritability, insomnia, restlessness, movement disorders, and seizures.

GABA is known to mediate pre-synaptic inhibition of afferent fibres in the motor system, and may also function to inhibit post-synaptic motor neurons.^[2, 3] The use of pharmaceutical interventions for the treatment of anxiety and insomnia, including the benzodiazepines, target GABA_A receptors to induce relaxation responses. GABA deficiency is associated with mood disorders, including anxiety and depression, insomnia, and epilepsy.^[1]

L-THEANINE

An amino acid isolated almost exclusively from the tea plant, *Camellia sinensis*, L-theanine may be responsible for counteracting the stimulatory effect of caffeine in green tea.^[4] As a water-soluble compound, its structure is similar to that of L-glutamate, suggesting a GABA-agonist mechanism of action. L-Theanine is readily absorbed to the bloodstream via intestinal absorption, reaches peak plasma concentration between 30 and 120 min after oral administration, and is known to cross the blood-brain barrier.^[4, 5, 7, 8, 9] Brain concentrations of L-theanine remain constant for up to 5 h.^[6]

L-Theanine ingestion has been shown to increase α-wave brain activity, associated with a relaxed but alert mental state, and promote GABA production in the CNS. Due to these actions, L-theanine consumption, both in green tea and as a nutraceutical supplement, has been associated with relaxation and improved learning ability.^[5]

STRESS AND ANXIETY

Electroencephalography (EEG) detects electrical activity in the extracellular fluid of the brain. Alpha waves are generated by the brain during relaxed and effortless alertness, while beta waves are associated with high levels of perceived stress. Kobayashi et al. (1998) showed that oral administration of L-theanine in 200 mg doses resulted in the increase of alpha-waves in the brain.^[7] The observed effect peaked at 30 min following administration.^[7, 8] Abdou et al. confirmed these results with L-theanine, 200 mg, and demonstrated similar α-wave EEG results upon oral administration of 100 mg GABA ($p < 0.05$), while also showing decreased β-wave activity, though the latter results were not statistically significant.^[2]

Salivary immunoglobulin A (sIgA) plays a role in protecting the mucosa of the upper respiratory tract against viral infections and bacterial adherence. Stress and high anxiety states are known to decrease sIgA, and thus, sIgA is considered a physiological marker of stress. Abdou et al. demonstrated that GABA administered to adult acrophobic (afraid of heights) subjects asked to cross a 54 m-high, 2 m in width, suspended bridge (used as a stressful stimulus) significantly reduced sIgA secretion measured in saliva ($p < 0.05$) as compared to placebo.^[2] Kimura et al. (2007) demonstrated in a small ($n = 12$) double-blinded, crossover study that L-theanine intake (200 mg) can reduce heart rate and sIgA during an acute stress task when compared to placebo.^[6] The same study also showed a reduction in perceived stress and state of anxiety, as measured by the State-Trait Anxiety Inventory

(STAI).

In a randomized, double-blind, placebo-controlled, 2-center study over eight weeks involving 40 subjects, schizophrenic patients showed reduction of anxiety ($p = 0.015$) as measured by the Hamilton Anxiety Rating Scale, when administered 400 mg/d L-theanine as an adjunct to ongoing antipsychotic medications.^[8] The study corroborated past research showing that L-theanine ameliorates emotional distress, subjective well-being, and sleep quality. L-Theanine has also been suggested to decrease cortisol production when used as augmentation of antipsychotic medications,^[9] associated with an improvement in activation and dysphoric mood scores ($p < 0.001$).^[8, 9]

SLEEP ENHANCEMENT

Insomnia, often related to anxiety, commonly reflects a lack of central inhibitory processes, and GABA is known to be the major inhibitory neurotransmitter of the brain.^[3] While oral administration of GABA has no effect on paradoxical sleep following sleep deprivation, it has been shown to decrease sleep latency by 20% while increasing the time spent in deep sleep by 20%.^[1, 3, 8]

In a prospective, randomized, double-blind, and placebo-controlled trial conducted in 40 patients who complained of insomnia symptoms, 30 patients (GABA treatment group) received 300 mg of GABA/day for 4 weeks compared to the placebo group ($n=10$). The study results showed a significant decrease in sleep latency and increase in sleep efficacy only in the GABA treatment group compared to the placebo group.^[10]

In a randomized, 10-week, double-blind placebo-controlled trial of 98 boys diagnosed with ADHD between the ages of 8 and 12 years old, 400 mg/d L-Theanine in two doses throughout the day significantly increased sleep efficiency (percentage of night spent sleeping restfully; a subjective measure, $p < 0.05$) and decreased the number of discreet bouts of nocturnal activity (an objective measure, $p < 0.029$).^[11]

MOOD DISORDERS

Stressful life events have been shown to result in changes to GABA_A receptor function, associated with an altered expression of stress responsiveness. These facts, combined with the success of GABA-modulating agents in animal models of depression, and known genetic variability in the GABA_A receptor, have suggested a role for modulated GABA responses in the development and pathophysiology of mood disorders.^[12]

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