

# Alpha-Theta Ultra PM™

## A Somnotropic Formula

- Supports Onset, Duration and Quality of Sleep
- Induces Calming Brainwave Activity

Good quality, uninterrupted sleep is integral to achieving optimal health. Without it, we fall prey to a cascade of physiologic dysfunction that results in increased body mass index (BMI), a decline in cognitive performance<sup>1</sup>, increased risk of heart disease and diabetes, hormonal imbalances, immune system dysfunction, depression and anxiety, and even vitamin D deficiency.

## Stages of Sleep

Sleep is a complex phenomenon constituted by two types of sleep patterns: non-REM (also called Slow Wave Sleep) and REM. In an ideal sleep pattern, a person experiences stages of sleep in non-REM and REM phases. Slow Wave Sleep (non-REM) presents as a high voltage slow wave electroencephalographic pattern (alpha and delta waves), while REM sleep exhibits a low voltage fast wave pattern (theta wave) accompanied by eye movement. If either phase is disrupted, sleep disturbance results. Although stages of sleep accompanied by calming brainwave activity is the natural circadian rhythm, 70% of American adults report that they obtain insufficient

sleep at least one night a month, and 11% report insufficient sleep every night. It is estimated that sleep-related problems affect 50 to 70 million Americans of all ages and socioeconomic classes.<sup>2</sup> Because sleep deprivation is linked to increased health risk, sleeplessness has become a public health concern.

## Root of Sleeplessness

At the root of impaired sleep quality may be a number of underlying issues. Neurochemical balance is key to achieving optimal sleep patterns. However, the following may be contributing to a neurochemical imbalance:

- Imbalance in neurotransmitter function (GABA, serotonin and dopamine)
- Lack of precursors to make neurotransmitters
- Excess glutamate
- HPA-Axis Dysregulation
- Anxiety and stress
- Environmental factors
- Electromagnetic fields



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Anxiety can be an instigator for sleepless nights and seems to be the result of an imbalance in neurotransmitter (GABA, serotonin and dopamine) function. Excess glutamate, the main excitatory neurotransmitter in the brain, results in low gamma-aminobutyric acid (GABA), essential for limiting the excitation of neurotransmitters and fundamental for good-quality sleep.

Electromagnetic fields and blue light also play a role in decreased melatonin production,<sup>3</sup> necessary for normal sleep cycles. Stress, common to 79% of all Americans<sup>4</sup>, can yield excess cortisol or insufficient cortisol production, both of which tip the hormonal balance to wakefulness in the night.

Although each person's neurochemistry is unique, **Alpha-Theta Ultra PM™** is a somnotropic formula that incorporates key nutrients recognized to induce calming brainwave activity and promote the onset and duration of high-quality sleep for most people by supporting GABA receptor function, and healthy levels of serotonin and dopamine.

Well-researched anxiolytic botanicals and nutrients include L-theanine (Suntheanine®), Baikal Skullcap (*Scutellaria baicalensis*), Lemon Balm (*Melissa officinalis*), Passionflower (*Passiflora caerulea*), 5-HTP, and Melatonin.

### **L-Theanine** (*Increases GABA and Dopamine Levels*)

L-theanine (γ-glutamylethylamide) is an amino acid found in green tea. A derivative of glutamic acid, it is one of the most important neurotransmitters. Fat-soluble, it is easily absorbed and crosses the blood-brain barrier resulting in increased dopamine and GABA levels in the brain<sup>5</sup>, and increased production of calming brain alpha-waves. L-theanine has been shown to support improved sleep quality not by sedation but through anxiolysis.<sup>6</sup>

#### *Protection Against Glutamate Toxicity*

There is some evidence L-theanine offers neuroprotective benefits partly due to the antagonistic action of theanine on glutamate subtype AMPA and kainite receptors. By acting on the glutamine (Gln) transporter, it inhibits the incorporation of extracellular Gln into neurons, suppressing the conversion of glutamine to glutamate by glutaminase.<sup>7</sup> This antagonistic activity plays a role in neuroprotection against glutamate toxicity.<sup>8,9,10</sup>

#### *Optimizes Stress Response*

In one study where subjects were given L-theanine and a placebo and exposed to stressors to test cortisol levels, the salivary cortisol response was significantly reduced in the subjects taking L-theanine when compared to the placebo.<sup>11</sup> In another study, L-theanine intake resulted in a reduction in heart rate (HR) and salivary immunoglobulin A (s-IgA) responses to acute stress



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relative to the placebo due to its effect on the sympathetic nervous system. Overall, L-theanine has been shown to cause “anti-stress effects” via the inhibition of cortical neuron excitation.<sup>12</sup>

#### *Increases Alpha Waves*

L-theanine has been found to significantly increase activity in the alpha frequency band, which is associated with relaxing the mind.<sup>13</sup>

#### *Boosts Brain-Derived Neurotrophic Factor (BDNF)*

BDNF plays a central role in neural development and cell survival and is essential to the molecular mechanisms of synaptic plasticity. In one study, L-theanine was found to increase expression of BDNF protein in the hippocampus due to its antagonistic action on the NMDA receptor, one of the three glutamate receptors. Therefore, L-theanine has been positively associated with BDNF, a protein that increases neural plasticity and promotes neurogenesis (dopaminergic and serotonergic).<sup>14</sup>

#### *Improves Overall Sleep Quality*

When evaluating L-theanine’s effect on sleep quality, one study looked at boys diagnosed with ADHD and found higher sleep percentage and sleep efficiency scores, compared to those in the placebo group.<sup>15</sup>

#### **Baikal Skullcap** *(Improves Overall Sleep Quality)*

*Scutellaria baicalensis* Georgi, or Chinese skullcap, has been widely used for its health-supporting properties for thousands of years in China. Flavones such as baicalin, wogonoside and their aglycones baicalein wogonin are the major

bioactive compounds extracted from the root of *S. baicalensis*.<sup>16</sup> Baicalin reports anxiolytic effects by acting on the GABA(A) receptor site and exerts this effect through the alpha2- and alpha3-containing subtypes.<sup>17,18,19</sup> In addition, the neuroprotective effects of *S. baicalensis* have been studied using both in vitro and in vivo models yielding positive results.<sup>20,21</sup>

#### **Lemon Balm** *(Melissa officinalis)*

*Lemon balm* is a perennial herbaceous plant in the mint family that has been shown to improve sleep quality.<sup>22</sup> In a study of children with sleep bruxism, Lemon Balm was administered, with and without *Phytolacca decandra*. A significant reduction of sleep bruxism was observed using the Visual Analogic Scale, demonstrating increased calmness during sleep.<sup>23</sup> In another study, Lemon Balm increased self-ratings of calmness and alertness, mitigating the effects of stress, often the source of sleeplessness.<sup>24</sup> These findings are also consistent with the German Commission E recommendations regarding the approval of *Melissa officinalis* L. extract use for nervous insomnia.<sup>25</sup>

#### **Passionflower** *(Passiflora caerulea)*

*Passiflora caerulea*, also known as blue passionflower, is one of the most vigorous and tender members the passionflower genus *Passiflora*. Native to South America, its traditional use has been as an anxiolytic. According to the American Botanical Council, the components of the fruit and flower that confer therapeutic benefits include maltol, coumarin derivatives, flavonoids (vitexin), and small amounts of essential oils.



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Much of the evidence supports the anxiolytic and sedative effects of *Passiflora caerulea* are due to its high chrysin content.<sup>26</sup> Another animal study demonstrated that the combined aqueous extract of *Melissa officinalis* and *Passiflora caerulea* reduced plasma corticosterone, the most important biomarker associated with stress.<sup>27</sup>

### 5-Hydroxytryptophan (5-HTP)

5-HTP is the intermediate metabolite in the biosynthesis of serotonin.<sup>28</sup> L-theanine, tryptophan and 5-hydroxytryptophan (5-HTP) all are reported to promote relaxation by acting as GABA receptor agonists, thereby boosting GABA levels.<sup>29</sup> In animals, 5-HTP is decarboxylated to form serotonin, which is then either acetylated to N-acetylserotonin or it is methylated to form 5-methoxytryptamin; these products are either methylated or acetylated to produce melatonin, which aids in sleep.

### Melatonin

Melatonin functions in the regulation of sleep, modulation of circadian rhythms and enhancement of immunity, while retaining its ability to reduce oxidative stress by processes that are, in part, receptor-independent. This multifunctional hormone mediates the body's response to light availability and signals its production in times of darkness to prepare for sleep. Production of melatonin decreases with age, which contributes to sleep difficulties associated with aging.

### Vitamin B6

Vitamin B6 is a cofactor in the tryptophan-serotonin pathway. When using 5-HTP to enhance serotonin and melatonin production, the activated form of vitamin B6 helps to catalyze the conversion of 5-HTP to serotonin.



#### Supplement Facts

Serving Size: 2 Capsules  
Servings Per Container: 30

	Amount Per Serving	% Daily Value
Vitamin B6 (as pyridoxal-5-phosphate)	10 mg	588%
Suntheanine® (L-Theanine)	350 mg	*
Baikal Skullcap ( <i>Scutellaria baicalensis</i> ) (root) (extract)	300 mg	*
Lemon Balm ( <i>Melissa officinalis</i> ) (leaf)	250 mg	*
Passionflower ( <i>Passiflora caerulea</i> ) (aerial part) (extract)	250 mg	*
5-HTP (L-5-Hydroxy-Tryptophan)	150 mg	*
Melatonin	3 mg	*

\* Daily Value not established

**Other ingredients:** Capsule shell (gelatin and water), medium chain triglycerides and silica.

**Suntheanine®** is a registered trademark of Taiyo International, Inc

**This product is gluten free.**

**RECOMMENDATION:** Two (2) capsules before bed as a dietary supplement or as otherwise directed by a healthcare professional. Use only before sleep.

**CAUTION:** Not recommended for children, pregnant or lactating women. Do not mix with alcohol, sedatives or stimulants.

**KEEP OUT OF REACH OF CHILDREN**

Store in a cool, dry area.  
Sealed with an imprinted safety seal for your protection.

Product # 8110 Rev. 07/19

**\* For the list of references, visit [www.bioticsresearch.com/alphatheta](http://www.bioticsresearch.com/alphatheta)**



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