

# The Scientific Difference Between Standard Synthetic Melatonin & Natural Plant-Based Melatonin

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Are natural source nutraceuticals better than the synthetic version? The honest answer is sometimes yes, sometimes no. It really depends on whether the science on that nutraceutical is able to show a demonstrable difference. For most of the time melatonin has been on the market there has really been no opportunity to answer this question since synthetic melatonin was the exclusive source of this nutraceutical. This has changed, however, since the introduction of Somnatural<sup>®</sup>, a natural phytomelatonin.

## **Somnatural<sup>®</sup> phytomelatonin**

Somnatural<sup>®</sup> phytomelatonin is natural, plant-based, Vegan Certified, Non-GMO Project Verified, kosher, and halal, which has broad appeal. In addition, laboratory analysis of Somnatural<sup>®</sup> reveals that in addition to its natural phytomelatonin content, it also contains 2-hydroxymelatonin and N-acetylserotonin.

The significance of this is that 2-hydroxymelatonin has greater immune benefits than melatonin<sup>1</sup>—and 2-hydroxymelatonin also has been shown to promote resistance to physical stresses in plants<sup>2</sup> and provide antioxidant activity against oxidative stress<sup>3</sup>. Likewise, research<sup>4</sup> has shown that N-acetylserotonin may play an important role in mood regulation, as well as stimulate proliferation of neuroprogenitor cells (i.e., cells that give rise to many different nerve cells) and prevent some of the negative effects of sleep deprivation. It may also turn out to play a role in mitigating common, age-related cognitive decline<sup>5</sup>.

Furthermore, unlike synthetic melatonin, none of the following chemical agents are used in its production: diethylmaonate, acrylonitrile, potassium hydroxide, p-methoxyanilin, methanol, sodium hydroxide, acetic anhydride, and others. But even more meaningful, phytomelatonin actually has some biological advantages over synthetic melatonin. Before sharing that information, let's do a quick review of the functions of melatonin.

## **About melatonin**

Melatonin is a hormone with a wide array of biological activities in plants, animals, unicellular organisms, and fungi. In humans and other mammals, it is produced by the tiny pineal gland, located behind the third ventricle of the brain. Melatonin plays important regulatory roles in sleep, body temperature balance, locomotory activities, circadian rhythms, immune system, and retinal physiology<sup>6 7</sup>.

Melatonin supplementation is best known for its role in helping people fall asleep<sup>8</sup>. In adults with difficulty sleeping, short-term use of melatonin modestly reduces the time it takes to fall asleep (sleep latency).<sup>9</sup> In addition, some patients report minor improvement in subjective feelings of sleep quality.<sup>10 11 12</sup> Furthermore, research has shown that melatonin supplementation is effective in adults with difficulty sleeping, secondary to other causes.<sup>13</sup>

In addition, both human and laboratory research has shown that melatonin decreases the upregulation of or suppresses levels of inflammatory chemicals in the body<sup>14 15 16 17 18 19 20 21</sup>. Interestingly, this additional benefit also has a relationship to sleep.

### **Inflammation and sleep**

Poor sleep is associated with higher levels of inflammatory markers. One study<sup>22</sup> found that a significant association between the sleep inconsistency and inflammation ( $p = 0.021$ ), suggesting inconsistent sleep is associated with higher levels of inflammatory biomarkers. Another study<sup>23</sup> found that self-reported insomnia symptoms were associated with higher values of inflammatory markers, while higher amounts of rapid eye movement (REM) sleep were associated with lower inflammatory markers. Sleep disturbances, specifically difficulties maintaining sleep and early morning awakenings were associated with higher inflammatory markers.

### **About phytomelatonin**

As with animals, melatonin is also produced in all plant species. In this case it is called phytomelatonin, and it aids plants in terms of root growth, leaf morphology, chlorophyll preservation and fruit development.<sup>24</sup> So how does phytomelatonin compare to synthetic melatonin?

To begin with, the scope of the impact of phytomelatonin in humans is broad, with roles having been demonstrated in mood swings, body temperature, sleep, cardiac rhythms, and immunological regulation modulators, as well as antioxidant property.<sup>25</sup>

An in-vitro study<sup>26</sup> was conducted, comparing the effects of phytomelatonin and synthetic melatonin, with or without vitamin C, in HaCaT keratinocytes (i.e., a type of skin cell) using a COX-2 enzyme inhibitory test (COX-2 is an inflammatory marker). Results were that COX-2 inhibitory activity was found to be about 6.5 times stronger with phytomelatonin than with synthetic melatonin. The reason for this is unknown but may be associated with other naturally occurring compounds in phytomelatonin.

In any case, additional research has also shown that phytomelatonin is capable of decreasing plasma levels of other inflammatory makers, including interleukin-6 (IL-6), tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ), and C-reactive protein (CRP), heat shock protein 70 extracellular (Hsp70e), and vascular endothelial growth factor (VEGF)<sup>27</sup>.

It is also worth noting that, in animal research<sup>28</sup>, phytomelatonin was shown to have impressive bioavailability. Furthermore, the elevated level of melatonin in the blood was associated with a rise in total antioxidant capacity of the blood with an ability to resist free radical damage.

### **Conclusion**

Since phytomelatonin is predominantly melatonin, it has the capacity to provide substantial support for the sleep cycle. However, since phytomelatonin was shown to have 6.5 times stronger anti-inflammatory activity (as previously described), and since inflammation is known to play a significant role in poor sleep, the use of natural phytomelatonin as an alternative to synthetic melatonin may provide an additional positive impact on the sleep cycle. Furthermore, the marketing advantage of a natural, plant-based, Vegan Certified, Non-GMO Project Verified, kosher, and halal Somnatural® phytomelatonin is certainly likely to have appeal over synthetic melatonin that is manufactured using a range of chemical agents.

*Nutraland USA offers clean, plant-based and sustainable branded ingredients supported by science. Our nutraceuticals are good for you, and good for the planet. For more information about how you can use Somnatural® phytomelatonin in your dietary supplements, contact [gene.bruno@nutrallandusa.com](mailto:gene.bruno@nutrallandusa.com); 949-988-7615.*

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