**The Scientific basis of ExstoBio’s Sleep Gummies 1.0 Formula**

**Abstract:**

The widespread adaptation of cannabis for therapeutic and medicinal benefits has been evident in the past decade, but science and product regulations are unfortunately being left in the dust. Full-spectrum CBD products derived from *Cannabis sativa* are promising well-being supplements to improve the sleep and quality-of-life in patient populations, including those suffering from insomnia, sleep troubles, and/or anxiety. Our team at ExstoBio has worked to design a full-spectrum sleep formula that we believe to be the safest and most efficacious on the legal hemp market. This includes a combination of well-known cannabinoids like CBD and THC (yes, a legal amount of D9-THC), as well as rare cannabinoids like CBC, CBG, and CBN, which have great supplemental potential, but are understudied due to their lack of abundance in past cannabinoid products. The combination of each cannabinoid (in addition to melatonin), all of which have been published to exhibit therapeutic potential, allows for the “entourage effect,” where various cannabis compounds work together to create unique benefits and outcomes[1](https://paperpile.com/c/OPncam/opFZF) to improve sleep in users seeking relief from occasional insomnia.

Please see our scientific backing to the crafted formula, including published cannabis background studies and an outline of beneficial cannabinoids in our Sleep 1.0 formula. Furthermore, help us advance the field and scientifically dissect the efficacy of our Sleep 1.0 formula by downloading our licensed Tetragram app to track your personal progress with this next-generation product. This will allow us to better personalize our products by improving the quality of life for niche patient populations taking our supplements when we develop our Sleep 2.0 product!

**Join us in our journey to legitimize and personalize cannabis therapeutics, so that patients can stop guessing and start treating.**

**Use:**

For a good night’s sleep, we suggest you take one Sleep Formula 1.0 gummy 30-minutes to 1-hour before bed. Be sure to track your progress with the Tetragram app!

**IN NURSING OR PREGNANT MOTHERS:**

Though healthcare providers advise against taking cannabis products while pregnant or nursing, roughly 7% of mothers still smoked cannabis during pregnancy in 2017[2](https://paperpile.com/c/OPncam/kts7K). The main pharmacological target of common cannabinoids, the type-1 cannabinoid receptor (CB1), is largely expressed throughout the central nervous system in neonatal development[3](https://paperpile.com/c/OPncam/NJpsM) and is important for development. It has been established that CBD and THC pass through the blood brain barrier (BBB) of neonates and most likely outcompete the binding of endogenous cannabinoids important in development, due to their higher affinity for the CB1 receptor. Scientists hypothesize that this can have profound developmental consequences[4](https://paperpile.com/c/OPncam/0DR3a).

Here, we stand with healthcare professionals and clinicians and advise against the use of ANY cannabis or hemp-related products in pregnant and nursing mothers[5](https://paperpile.com/c/OPncam/EhOlW). **However, we do hypothesize that full spectrum CBD products might be a safer alternative than high-THC products in pregnant/nursing mothers who consume cannabis or have a cannabis use disorder (CUD).**

**Background:**

From critical roles in memory consolidation[6](https://paperpile.com/c/OPncam/7aY8), to emotional processing[7](https://paperpile.com/c/OPncam/3Gg3), to clearance of protein debris from cerebrospinal fluid[8](https://paperpile.com/c/OPncam/D3vm), sleep is essential for maintaining a healthy and balanced lifestyle. According to the CDC, about 35% of American adults reported obtaining less than the recommended 7 hours of sleep per night[9](https://paperpile.com/c/OPncam/1mC3), with insomnia generating 5.5 million clinical visits in 2010[10](https://paperpile.com/c/OPncam/XoGD). Insomnia was found to correlate with high blood pressure, urinary problems, chronic pain, and GI issues in patients[11](https://paperpile.com/c/OPncam/KSoT), further highlighting the importance of sleep. Though several sleep aid therapeutics exist for patients, these have many shortcomings including grogginess, dependence, depression, and the potential for overdose death[12](https://paperpile.com/c/OPncam/TMXs).

**Cannabis in sleep**

Great potential lies in the use of cannabis-based products for improving sleep. The National Academy of Sciences concluded that “[t]here is moderate evidence that cannabinoids… are an effective treatment to improve short-term sleep outcomes in individuals with sleep disturbance…”[13](https://paperpile.com/c/OPncam/LASA). The endocannabinoid system has been suggested to regulate the circadian sleep-wake cycle[14](https://paperpile.com/c/OPncam/hxBx), further suggesting a role of cannabis in improving sleep. In patients suffering from pain, oral cannabinoids have been identified to improve sleep, too[15](https://paperpile.com/c/OPncam/nY6U).

**Formula:**

Our Sleep 1.0 formula has been carefully crafted to include compounds that show great promise for improving sleep in individuals. With the success in a recent [randomized, blinded study](https://www.prnewswire.com/news-releases/open-book-extracts-announces-completion-of-historys-largest-randomized-controlled-trial-of-rare-cannabinoids-for-sleep-radicle-rest-301576872.html) across 2,000 patients that linked specific cannabinoids to improvements in sleep, we tailored Sleep 1.0 to closely resemble this formula. This formula is a full-spectrum gummy, with several beneficial cannabinoids and compounds for promoting sleep in those who need it. This includes CBD, which has been shown to exhibit sedative properties[16](https://paperpile.com/c/OPncam/vqLt). This acts to promote sleep in a safe manner, as oral CBD has been established to be well tolerated at high doses[17](https://paperpile.com/c/OPncam/UHnI). Legal levels of delta-9 THC have also been included due to established sedative properties[18](https://paperpile.com/c/OPncam/om1K).

Rare cannabinoids have also been included, including CBN which is suggested to be sedative[19](https://paperpile.com/c/OPncam/rGxW). CBG is included, as well, which is thought to have great potential in improving sleep. In insomnia patients using CBG-dominant cannabis strains, 73% claimed superiority of this alternative medicine over conventional insomnia medications[20](https://paperpile.com/c/OPncam/Pt4W). We included another rare cannabinoid, CBC, whose synergistic relationship with the endocannabinoid system is hypothesized to improve sleep quality in those suffering from sleep disorders[21](https://paperpile.com/c/OPncam/JCjS).

Finally, we have included a small amount of melatonin in our sleep formula to promote a good night’s sleep. Melatonin administration has been extensively studied and established to have positive effects on sleep quality[22](https://paperpile.com/c/OPncam/t2aS),[23](https://paperpile.com/c/OPncam/X5N3). Anecdotally, melatonin co-administration with cannabinoids improved sleep quality and reduced morning grogginess, which is often reported with melatonin use alone. Furthermore, the co-administration of CBD and melatonin in patients suffering from insomnia led to a reduction in anxiety, panic, paranoia, depression, and even pain[23](https://paperpile.com/c/OPncam/X5N3).

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