

# Safety Data Sheet

## Qualia safety overview

Given the doses of each ingredient and taking into account the synergies between different ingredients, there is no reason to believe that Qualia will induce any major adverse side effects in healthy adults.

There are a number of diseases for which Qualia may be contraindicated, and a number of prescription drugs with which Qualia may potentially interact. For anyone with any of the following conditions or on any of the following medications, or with concerns of any kind, don't take Qualia or discuss with your doctor before doing so.

Due to the lack of studies on the effect of some ingredients on fetal and infant development, Qualia **should not be taken by pregnant or nursing mothers.**

**Qualia is intended for use by healthy adults, over 18 years old.**

**Allergies to any of the ingredients is also a contraindication.**

### Contraindications

Pregnancy and breastfeeding  
Phenylketonuria  
Seizure disorders  
Bipolar disorder  
Depression  
Schizophrenia  
Migraine  
Dementia  
Hypertension  
Vascular disorders  
Cardiac diseases  
Chronic lung diseases  
Kidney diseases  
Liver diseases  
History of stomach ulcers  
Diabetes  
Hypothyroidism or hyperthyroidism  
Hormone-related cancers (or family history)  
Hormone-related conditions

### Possible drugs interactions

MAO inhibitors  
Levodopa  
Cholinergic and anticholinergic drugs  
Antidepressants  
Antipsychotics  
Painkillers  
NSAIDs  
Stimulants  
Anticoagulant or antiplatelet drugs  
Antihypertensives  
Oral bisphosphonates  
Tetracyclines  
Quinolone antibiotics  
Antiretrovirals  
Thyroid medication  
Kidney medication  
Liver medication  
Diabetes medication  
Scopolamine  
Calcium channel blockers or other sedatives  
Chemotherapy or radiation therapy

**If you notice any of the following symptoms (mild), discontinue, then once clear, you may experiment again at a lower dose. Also check troubleshooting in FAQ:**

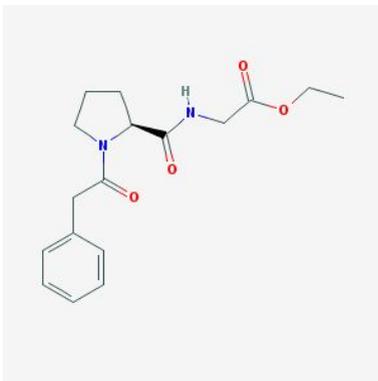
Sleep disturbances, altered blood pressure, irregular heartbeat, headache, fatigue, nausea, gastrointestinal issues, irritability, loss of appetite, dizziness, polyuria, itch, rash, sweating, dry mouth.

**If you notice these symptoms (severe), discontinue immediately. Seek appropriate medical attention if concerning:**

Insomnia, depression, anxiety, restlessness, involuntary movements, freezing, muscle cramps, hallucinations, migraine, pain, tinnitus, blurred vision, cardiovascular changes, gastrointestinal issues, liver and kidney problems, allergies.

## Nootropic Compounds

### Noopept



#### Scientific name

ethyl  
2-[[[(2S)-1-(2-phenylacetyl)pyrrolidine-2-carbonyl]amino]acetate

#### Empirical formula

$C_{17}H_{22}N_2O_4$

#### Primary mechanism

Glutamatergic

#### Dose

30 mg

#### Daily upper limit

ND (40 mg)

#### Hacker doses

10-40 mg

**Form:** Synthetic peptide

**Product info page:** [Noopept](#)

#### Safety

Noopept has a recommended dose of 10-40 mg [1].

Studies in rabbits on the chronic toxicity of Noopept, administered orally in a dose of 10 and 100 mg/kg/day (equivalent to ~3 and 30 mg/Kg in adult humans [2]) over 6 months, showed that Noopept induced no irreversible pathologic changes in the organs and systems studied, and exhibited no allergenic, immunotoxic, and mutagen activity [3].

Noopept used in a daily dose of 20 mg during 2 months showed a high level of safety. [4]

Noopept at a dose of 20 mg showed 1.8-fold less side-effects relative to 1200 mg of the racetam Piracetam [4].

A dose of 20 mg/day during 56 days induced sleep disturbance and increased blood pressure, but these were reported as being transient and of insignificant severity [5].

At higher doses (>40 mg day), users may experience some or all of the following side effects: headache, insomnia, fatigue, nausea, gastrointestinal issues [1].

### **Interactions**

ND

### **Synergies**

ND

### **Safety Overview**

Although human trials are limited, Noopept at the recommended dose should have a high level of safety with only a possibility of mild occasional side-effects. It is contraindicated for individuals with hypertension.

### **References**

[1] Nootriment.com: [Noopept](#)

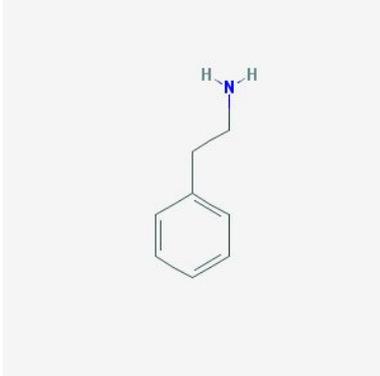
[2] Food and Drug Administration (2005). Guidance for Industry Estimating the Maximum Safe Starting Dose in Initial Clinical Trials for Therapeutics in [Adult Healthy Volunteers](#).

[3] Amelin AV, Iliukhina Alu, Shmonin AA (2011). Noopept in the treatment of mild cognitive impairment in patients with stroke. Zh Nevrol Psikhiatr Im S S Korsakova, 111(10 Pt 1):44-6. PMID: [22500312](#) [Article in Russian, info from abstract]

[4] Kovalenko LP, et al (2002). Preclinical study of noopept toxicity. Eksp Klin Farmakol. 2002 Jan-Feb;65(1):62-4. PMID: [12025790](#)

[5] Neznamov GG, Teleshova ES (2009). Comparative studies of Noopept and piracetam in the treatment of patients with mild cognitive disorders in organic brain diseases of vascular and traumatic origin. Neurosci Behav Physiol, 39(3):311-21. doi: [10.1007/s11055-009-9128-4](#)

## Phenylethylamine

**Scientific name**

2-phenylethylamine

**Empirical formula**

C<sub>8</sub>H<sub>11</sub>N

**Primary mechanism**

Dopaminergic

**Dose**

500 mg

**Daily upper limit**

ND (1,000 mg)

**Hacker doses**

500-1,000 mg

**Form:** Naturally occurring form

**Product info page:** [Phenylethylamine](#)

**Safety**

The recommended dose of Phenylethylamine as a nutritional supplement is up to 500 mg/day [1].

At this dose, side-effects are rare and may include light headaches or nausea [1].

**Interactions**

Phenylethylamine increases the release of dopamine in the brain [2] and is quickly metabolized by a number of enzymes, including MAO-B; MAO inhibitors therefore potentiate its effects [4]. Phenylethylamine should not be taken by anyone who is currently taking prescribed MAO inhibitors (particularly MAO-A inhibitors).

Ritalin increases the levels of Phenylethylamine in the brain [7] and these should not be taken together. Undesirable side effects include mild headaches, nausea, insomnia, and constipation; at high doses, they may induce cardiovascular complications [8].

Phenylethylamine increases the levels of norepinephrine which can lead to vasoconstriction and increased blood pressure; individuals who have been prescribed blood pressure medication should not take it.

**Synergies**

Because of its high sensitivity to MAO, Phenylethylamine induces effects only at high doses or combined with MAO inhibitors [3]. Its breakdown is delayed by MAO-B inhibitors, allowing it to remain active for a longer period of time. It is therefore usually stacked with Hordenine, a natural MAO-B inhibitor.

Phosphatidylserine also acts as a MAO-B inhibitor; it thereby also potentiates the action of Phenylethylamine [5].

L-phenylalanine can be converted to Phenylethylamine [6], thereby potentiating its effects.

By increasing the levels of dopamine, Phenylethylamine's actions are also concurrent to those of Mucuna Pruriens, Tyrosine, Phenylalanine, CDP-Choline, Rhodiola Rosea, and Vitamin C. However, given the doses of each ingredient, the overall effect falls within safety limits.

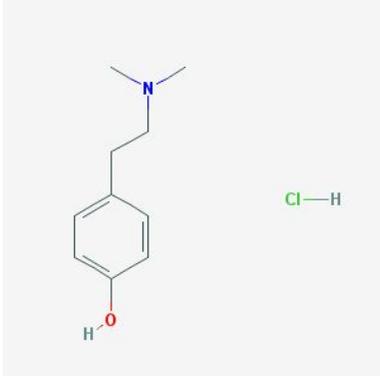
### **Safety Overview**

Although human trials are limited, Phenylethylamine at the recommended dose should have a high level of safety. However, due to its effects on mood, it may be contraindicated for some individuals.

### **References**

- [1] Nootriment.com: [Phenylethylamine dosage](#)
- [2] Xie Z and Miller GM (2008). Beta-phenylethylamine alters monoamine transporter function via trace amine-associated receptor 1: implication for modulatory roles of trace amines in brain. J Pharmacol Exp Ther. 2008 May; 325(2):617-28. doi: [10.1124/jpet.107.134247](#)
- [3] Sabelli HC and Javaid JI (1995). Phenylethylamine modulation of affect: therapeutic and diagnostic implications. J Neuropsychiatry Clin Neurosci, 7(1):6-14. doi: [10.1176/jnp.7.1.6](#)
- [4] Sabelli H, et al (1994). Phenylethylamine relieves depression after selective MAO-B inhibition. J Neuropsychiatry Clin Neurosci, 6(2):203. doi: [10.1176/jnp.6.2.203](#)
- [5] Buckman TD, et al (1983). Investigations of the mechanism of selective inhibition of type B mitochondrial monoamine oxidase by phosphatidylserine. Biochem Pharmacol, 32(23):3639-47. PMID: [6651881](#)
- [6] Marcobal A, et al (2012). Tyramine and phenylethylamine biosynthesis by food bacteria. Crit Rev Food Sci Nutr. 2012; 52(5):448-67. doi: [10.1080/10408398.2010.500545](#)
- [7] Kusaga A, et al (2002). Increased urine phenylethylamine after methylphenidate treatment in children with ADHD. Ann Neurol, 52(3):372-4. doi: [10.1002/ana.10302](#)
- [8] Irsfeld M, et al (2013).  $\beta$ -phenylethylamine, a small molecule with a large impact. Webmedcentral, 4(9). pii: 4409. PMID: [24482732](#)

## Hordehine HCl



### Scientific name

4-[2-(dimethylamino)ethyl]phenol;hydrochloride

### Empirical formula

$C_{10}H_{16}ClNO$

### Primary mechanism

Dopaminergic

### Dose

20 mg

### Daily upper limit

ND (50 mg)

### Hacker doses

20–50 mg

**Form:** Synthetic form

**Product info page:** [Hordehine HCl](#)

### Safety

There are insufficient in vivo studies to determine the optimal dosage for Hordehine. Users have reported Hordehine doses ranging from 20–50 mg/day as effective and safe [1].

A study on horses showed that an oral dose of 2.0 mg/kg Hordehine induced no changes in heart rate, respiratory rate, basal body temperature or behavior [2].

### Interactions

Hordehine acts as a MAO-B inhibitor. MAO-B mainly metabolizes dopamine, but it also breaks down Phenylethylamine, which results in a dual action to increase the levels of dopamine. MAO-B inhibitors thereby increase the levels of dopamine by two routes: decreased breakdown of Phenylethylamine (leading to increased release of dopamine) and decreased breakdown of dopamine.

A number of side-effects have been attributed to MAO inhibitors, mainly related to increased levels of dopamine. These include: increased tremor, loss of balance, restlessness, facial grimace, falls, stiff neck, tardive dyskinesia, dystonic symptoms, dyskinesia, involuntary movements, freezing, apraxia, muscle cramps, hallucinations, dizziness, confusion, anxiety, depression, drowsiness, behavior/mood change, sleep disturbance, transient irritability, headache, migraine, pain, tinnitus, dry mouth, blurred vision, cardiovascular alterations, nausea/vomiting, constipation.

Most of these effects occur at very high doses of MAO inhibitors. It should be noted that most side-effects attributed to MAO inhibitors are mainly due to MAO-A

inhibitors. MAO-B inhibitors have a more selective action on Phenylethylamine and dopamine [3].

MAO inhibitors should not be combined with other psychoactive substances (antidepressants, painkillers, stimulants). Drugs with actions on epinephrine, norepinephrine, or dopamine must be administered at low doses due to potentiation and prolonged effect.

### **Synergies**

Hordenine acts as a MAO-B inhibitor and acts synergistically with Phenylethylamine.

Phenylethylamine is quickly metabolized in the brain by a number of enzymes, including MAO-B. Because of its high sensitivity to MAO, Phenylethylamine induces effects only at high doses or combined with MAO inhibitors [4]. Its breakdown is delayed by MAO-B inhibitors, allowing it to remain active for a longer period of time. It is therefore usually stacked with Hordenine, a natural MAO-B inhibitor. Coupling Phenylethylamine with a MAO-B inhibitor has been shown to potentiate its beneficial effects [5]. Phosphatidylserine also acts as an inhibitor of MAO-B [6]; Hordenine is therefore also synergistic with phosphatidylserine.

By increasing the levels of dopamine, Hordenine's actions are also concurrent to those of Mucuna Pruriens, Tyrosine, Phenylalanine, CDP-Choline, Rhodiola Rosea, and Vitamin C. However, given the doses of each ingredient, the overall effect falls within safety limits.

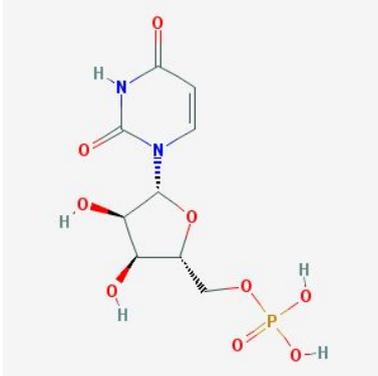
### **Safety Overview**

Despite the lack of human trials, users have reported that Hordenine HCl at the recommended dose is effective and safe.

### **References**

- [1] Nootriment.com: [Hordenine dosage](#)
- [2] Frank M, et al (1990). Hordenine: pharmacology, pharmacokinetics and behavioural effects in the horse. *Equine Vet J.* 1990 Nov;22(6):437-41. doi: [10.1111/j.2042-3306.1990.tb04312.x](#)
- [3] Stahl SM and Felker A (2008). Monoamine oxidase inhibitors: a modern guide to an unrequited class of antidepressants. *CNS Spectr*, 13(10):855-70. doi: [10.1017/S1092852900016965](#)
- [4] Sabelli HC and Javaid JI (1995). Phenylethylamine modulation of affect: therapeutic and diagnostic implications. *J Neuropsychiatry Clin Neurosci*, 7(1):6-14. doi: [10.1176/jnp.7.1.6](#)
- [5] Sabelli H, et al (1994). Phenylethylamine relieves depression after selective MAO-B inhibition. *J Neuropsychiatry Clin Neurosci*, 6(2):203. doi: [10.1176/jnp.6.2.203](#)
- [6] Buckman TD, et al (1983). Investigations of the mechanism of selective inhibition of type B mitochondrial monoamine oxidase by phosphatidylserine. *Biochem Pharmacol*, 32(23):3639-47. PMID: [6651881](#)

## Uridine monophosphate



### Scientific name

[(2R,3S,4R,5R)-5-(2,4-Dioxypyrimidin-1-yl)-3,4-dihydroxyoxolan-2-yl]methyl dihydrogen phosphate

### Empirical formula

C<sub>9</sub>H<sub>13</sub>N<sub>2</sub>O<sub>9</sub>P

### Primary mechanism

Purinergetic

### Dose

500 mg

### Daily upper limit

ND (1740 mg)

### Hacker doses

500-2000 mg

**Form:** Naturally occurring nucleic acid; the phosphorylated form of uridine increases its bioavailability

**Product info page:** [Uridine Monophosphate](#)

### Safety

A dose of 1740 mg of uridine taken every other day for 32 weeks showed that uridine supplementation was well tolerated and safe [1].

A dose of 1740 mg of uridine taken every other day for 48 weeks also showed no increased rate of adverse side-effects relatively to the placebo group [2].

Uridine at a dose of 1000 mg/day administered to adolescents for 6 weeks was shown to be well tolerated with no adverse effects being reported [3].

### Interactions

ND

### Synergies

Uridine is synergistic with CDP-choline: uridine administration increases CDP-choline levels in the brain [4] and CDP-choline increases the levels of uridine [5].

Synergistic with DHA in increasing brain levels of phosphatidylcholine [6].

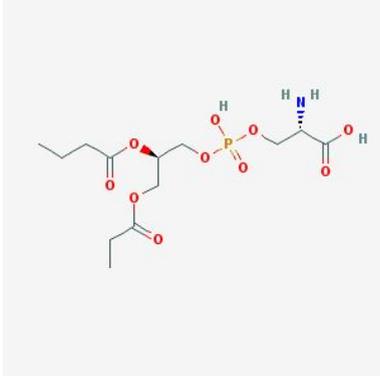
### Safety Overview

Although human trials are limited, Uridine monophosphate has been used at higher doses, being well tolerated and safe, with no adverse side-effects.

## References

- [1] McComsey GA, et al (2008). Uridine supplementation in HIV lipodystrophy: pilot trial on safety and effect on mitochondrial indices. *Eur J Clin Nutr*, 62(8):1031-7. doi: [10.1038/sj.eicn.1602793](https://doi.org/10.1038/sj.eicn.1602793)
- [2] McComsey GA, et al (2010). Uridine supplementation in the treatment of HIV lipodystrophy: results of ACTG 5229. *AIDS*, 24(16):2507-15. doi: [10.1097/QAD.0b013e32833ea9bc](https://doi.org/10.1097/QAD.0b013e32833ea9bc)
- [3] Kondo DG, et al (2011). Open-label uridine for treatment of depressed adolescents with bipolar disorder. *J Child Adolesc Psychopharmacol*, 21(2):171-5. doi: [10.1089/cap.2010.0054](https://doi.org/10.1089/cap.2010.0054)
- [4] Cansev M, et al (2005). Oral uridine-5'-monophosphate (UMP) increases brain CDP-choline levels in gerbils. *Brain Res*, 1058(1-2):101-8. doi: [10.1016/j.brainres.2005.07.054](https://doi.org/10.1016/j.brainres.2005.07.054)
- [5] Wurtman RJ, et al (2000). Effect of oral CDP-choline on plasma choline and uridine levels in humans. *Biochem Pharmacol*, 60(7):989-92. doi: [10.1016/S0006-2952\(00\)00436-6](https://doi.org/10.1016/S0006-2952(00)00436-6)
- [6] Wurtman RJ, et al (2006). Synaptic proteins and phospholipids are increased in gerbil brain by administering uridine plus docosahexaenoic acid orally. *Brain Res*, 1088(1):83-92. doi: [10.1016/j.brainres.2006.03.019](https://doi.org/10.1016/j.brainres.2006.03.019)

## Phosphatidylserine



### Scientific name

(2S)-2-amino-3-[[[(2R)-2-butanoyloxy-3-propanoyloxy propoxy]-hydroxyphosphoryl]oxypropanoic acid

### Empirical formula

$C_{13}H_{24}NO_{10}P$

### Primary mechanism

Dopaminergic

### Dose

200 mg

### Daily upper limit

ND (2000 mg)

### Hacker doses

200-500 mg 3-4x/day

**Form:** Naturally occurring form

**Product info page:** [Phosphatidylserine](#)

### Safety

Soy-derived Phosphatidylserine at a dose of 500 mg/day is generally recognized as safe by the FDA [1].

Supplementation with Phosphatidylserine at 300 mg/day for 3 months showed no adverse effects [2,3].

Supplementation with Phosphatidylserine at doses up to 600 mg/day for 12 weeks in elderly persons was not associated with any adverse effects [4].

### Interactions

Phosphatidylserine acts as an inhibitor of MAO-B [5]. MAO-B mainly metabolizes dopamine, but it also breaks down Phenylethylamine, which results in a dual action to increase the levels of dopamine. MAO-B inhibitors thereby increase the levels of dopamine by two routes: decreased breakdown of Phenylethylamine (leading to increased release of dopamine) and decreased breakdown of dopamine.

A number of side-effects have been attributed to MAO inhibitors, mainly related to increased levels of dopamine. These include: increased tremor, loss of balance, restlessness, facial grimace, falls, stiff neck, tardive dyskinesia, dystonic symptoms, dyskinesia, involuntary movements, freezing, apraxia, muscle cramps, hallucinations, dizziness, confusion, anxiety, depression, drowsiness, behavior/mood change, sleep disturbance, transient irritability, headache, migraine, pain, tinnitus, dry mouth, blurred vision, cardiovascular alterations, nausea/vomiting, constipation.

Most of these effects occur at very high doses of MAO inhibitors. It should be noted that most side-effects attributed to MAO inhibitors are mainly due to MAO-A inhibitors. MAO-B inhibitors have a more selective action on Phenylethylamine and dopamine [6].

### **Synergies**

Synergistic with MAO-B inhibitors like Hordenine.

Potentiates the action of Phenylethylamine.

By increasing the levels of dopamine, Phosphatidylserine, also has an action concurrent to that of Mucuna Pruriens, Tyrosine, Phenylalanine, CDP-Choline, Rhodiola Rosea, and Vitamin C.

### **Safety Overview**

Phosphatidylserine at the recommended dose is generally recognized as safe (GRAS) by the FDA and has shown no adverse side-effects in human trials.

### **References**

[1] Food and Drug Administration. GRAS Notice for Phosphatidylserine derived from Sunflower Lecithin. [2016](#)

[2] Moré MI, et al (2014). Positive effects of soy lecithin-derived phosphatidylserine plus phosphatidic acid on memory, cognition, daily functioning, and mood in elderly patients with Alzheimer's disease and dementia. *Adv Ther*, 31(12):1247-62. doi: [10.1007/s12325-014-0165-1](#)

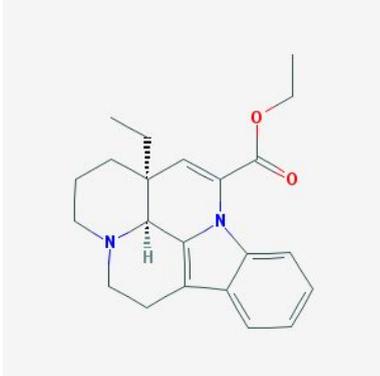
[3] Richter Y, et al (2013). The effect of soybean-derived phosphatidylserine on cognitive performance in elderly with subjective memory complaints: a pilot study. *Clin Interv Aging*, 8:557-63. doi: [10.2147/CIA.S40348](#)

[4] Jorissen BL, et al (2002). Safety of soy-derived phosphatidylserine in elderly people. *Nutr Neurosci*, 5(5):337-43. doi: [10.1080/1028415021000033802](#)

[5] Buckman TD, et al (1983). Investigations of the mechanism of selective inhibition of type B mitochondrial monoamine oxidase by phosphatidylserine. *Biochem Pharmacol*, 32(23):3639-47. PMID: [6651881](#)

[6] Stahl SM and Felker A (2008). Monoamine oxidase inhibitors: a modern guide to an unrequited class of antidepressants. *CNS Spectr*, 13(10):855-70. doi: [10.1017/S1092852900016965](#)

## Vinpocetine



### Scientific name

Ethyl apovincamate

### Empirical formula

$C_{22}H_{26}N_2O_2$

### Primary mechanism

Phosphodiesterase Inhibitor / cerebral vasodilator

### Dose

30 mg

### Daily upper limit

60 mg

### Hacker doses

5–60 mg

**Form:** Naturally occurring form extracted from *Vinca minor*

**Product info page:** [Vinpocetine](#)

### Safety

Vinpocetine administered orally at a dose of 30 mg/day for 30 days (followed by 60 days of a 15 mg/day dose) induced no adverse side-effects [1].

Vinpocetine administered at increasing doses of 30, 45, and 60 mg/day during a one-year period did not induce any adverse effects [2].

In a trial in which Vinpocetine was administered (intravenously) at a dose of 30 mg/day for 7 days, no adverse effects were reported [3].

In a study in which Vinpocetine was administered (intravenously) at a dose of 1 mg/kg/day for 14 days, no adverse effects were reported [4].

### Interactions

Since it induces vasodilation [5], care should be taken when using blood-thinning medication.

### Synergies

ND

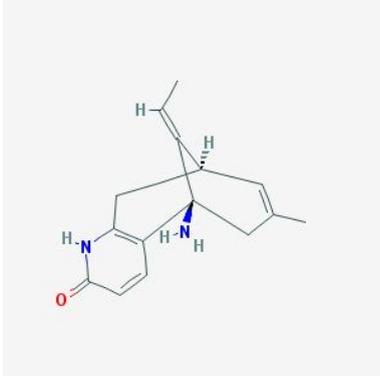
### Safety Overview

In human trials, Vinpocetine at the recommended dose did not induce any adverse side-effects. However, due to its cerebral vasodilator effects it may be contraindicated for some individuals.

## References

- [1] Balestreri R, et al (1987). A double-blind placebo controlled evaluation of the safety and efficacy of vinpocetine in the treatment of patients with chronic vascular senile cerebral dysfunction. *J Am Geriatr Soc*. 1987 May;35(5):425-30. doi: [10.1111/j.1532-5415.1987.tb04664.x](https://doi.org/10.1111/j.1532-5415.1987.tb04664.x)
- [2] Thal LJ, et al (1989). The safety and lack of efficacy of vinpocetine in Alzheimer's disease. *J Am Geriatr Soc*, 37(6):515-20. doi: [10.1111/j.1532-5415.1989.tb05682.x](https://doi.org/10.1111/j.1532-5415.1989.tb05682.x)
- [3] Zhang W, et al (2016). Efficacy and Safety of Vinpocetine as Part of Treatment for Acute Cerebral Infarction: A Randomized, Open-Label, Controlled, Multicenter CAVIN (Chinese Assessment for Vinpocetine in Neurology) Trial. *Clin Drug Investig [Epub ahead of print]* doi: [10.1007/s40261-016-0415-x](https://doi.org/10.1007/s40261-016-0415-x)
- [4] Szilágyi G, et al (2005). Effects of vinpocetine on the redistribution of cerebral blood flow and glucose metabolism in chronic ischemic stroke patients: a PET study. *J Neurol Sci*, 229-230:275-84. doi: [10.1016/j.ins.2004.11.053](https://doi.org/10.1016/j.ins.2004.11.053)
- [5] Hagiwara M, et al (1984). Effects of vinpocetine on cyclic nucleotide metabolism in vascular smooth muscle. *Biochem Pharmacol*, 33(3):453-7. doi: [10.1016/0006-2952\(84\)90240-5](https://doi.org/10.1016/0006-2952(84)90240-5)

## Huperzine A 1%



### Scientific name

(1R,9R,13E)-1-amino-13-ethylidene-11-methyl-6-azatricyclo[7.3.1.0<sup>2,7</sup>]trideca-2(7),3,10-trien-5-one

### Empirical formula

C<sub>15</sub>H<sub>18</sub>N<sub>2</sub>O

### Primary mechanism

Cholinergic

### Dose

5 mg 1% (0.05mg)

### Daily upper limit

ND (0.4 mg)

### Hacker doses

0.05-0.2 mg

**Form:** Natural form extracted from *Huperzia serrata*

**Product info page:** [Huperzine A](#)

### Safety

Huperzine A is a reversible acetylcholinesterase inhibitor; this class of drugs is generally well tolerated [1].

Huperzine A is highly specific for acetylcholinesterase, which suggests that it can be more effective with fewer adverse effects [2]. However, cholinergic side effects may be noted, including hyperactivity, nasal obstruction, nausea, vomiting, diarrhea, insomnia, anxiety, dizziness, thirst, and constipation.

Huperzine A has been used in human trials with a good safety profile; administration at doses of 0.1 mg/day, 0.2 mg/day, and 0.3 mg/day did not induce any serious side effects [2].

A dose of 0.4 mg/day administered for 60 days caused mild to moderate nausea in some individuals [3].

A dose of 0.4 mg/d administered for 12 weeks caused mild and transient adverse events (edema of bilateral ankles and insomnia) in 3% of the subjects [4].

Abnormalities in ECG patterns have been reported (cardiac ischemia and arrhythmia) [6].

No pathological changes were found in histological studies of the liver, kidney, heart, lungs, or brain after 180 days of administration [3].

## Interactions

Huperzine A increases the levels of acetylcholine by inhibiting acetylcholinesterase; it can therefore potentially interact with cholinergic and anticholinergic drugs.

Individuals with the following conditions may be at risk of adverse effects with choline intakes at the Upper Intake Level: trimethylaminuria, renal disease, liver disease, depression, and Parkinson's disease [7].

## Synergies

By increasing the levels of acetylcholine, Huperzine A's actions are concurrent to those of Centrophenoxine, CDP-choline, Alpha GPC, Acetyl-L-Carnitine, Vitamin B5, Bacopa Monnieri and Forskolin. However, given the low dose of each ingredient, the overall effect falls within safety limits: the Tolerable Upper Intake Level of choline for adults is 3.5 g/day [7].

In vitro studies suggest that the action of huperzine A is potentiated by the green tea polyphenol epigallocatechin-3-gallate (EGCG) [8].

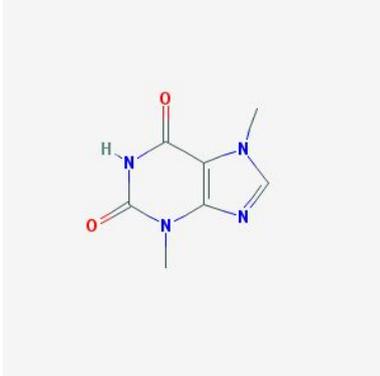
## Safety Overview

In human trials, higher doses of Huperzine A did not induce any serious side-effects.

## References

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## Theobromine



### Scientific name

3,7-dimethylpurine-2,6-dione

### Empirical formula

C<sub>7</sub>H<sub>8</sub>N<sub>4</sub>O<sub>2</sub>

### Primary mechanism

Purinergetic / stimulant

### Dose

150 mg

### Daily upper limit

ND (<800 mg)

### Hacker doses

500-1000 mg

**Form:** Natural form extracted from *Theobroma Cacao*

**Product info page:** [Theobromine](#)

### Safety

A dose of 150 mg/day of theobromine falls within regular daily consumption values from dietary sources, which have been generally recognized as safe by the US Food and Drug Administration [1].

Theobromine has a low order of toxicity [2].

The acute oral LD50 of theobromine in rats has been reported to be 950 mg/kg body weight, whereas in mice it is 1356 mg/kg body weight [3], which corresponds to approximately 110-150 mg/kg/day in humans (7500- 10000 mg/day for a ~70 kg/150lb adult) [4].

### Interactions

ND

### Synergies

Theobromine is related to and synergistic with caffeine (present in PurEnergy®) as a CNS stimulant, with slower onset and longer duration than caffeine [5]

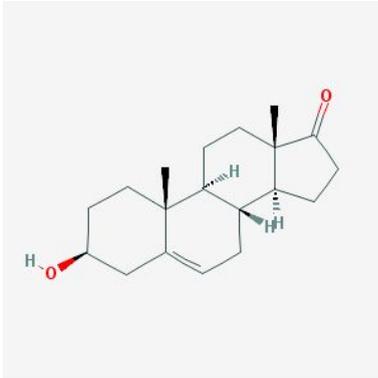
### Safety Overview

Theobromine has low toxicity and is generally recognized as safe (GRAS) by the FDA at the recommended dose.

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## DHEA



### Scientific name

(3S,8R,9S,10R,13S,14S)-3-hydroxy-10,13-dimethyl-1,2,3,4,7,8,9,11,12,14,15,16-dodecahydrocyclopenta[a]phenanthren-17-one

### Empirical formula

$C_{19}H_{28}O_2$

### Primary mechanism

Androgenic hormone / vasodilator

### Dose

20 mg

### Daily upper limit

100 mg

### Hacker doses

25-100 mg

**Form:** Synthetic DHEA with the same form as the endogenous hormone

**Product info page:** [DHEA](#)

### Safety

Doses of DHEA of up to 50 mg/day are generally seen as effective in avoiding side-effects for long-term use [1].

50 mg/day of DHEA for 52 weeks did not induce any significant toxic or adverse effects [2].

Lower doses of 25 mg/day for longer periods of time (2 years) have also been deemed as safe [3].

Because DHEA yields estrogen and testosterone, people with hormone-related cancers, such as breast, prostate, ovarian, adrenal, and testicular cancer, or a family history of these cancers, should not take DHEA [4].

DHEA may worsen hormone-related conditions, such as endometriosis or polycystic ovarian syndrome [4].

People with a history of depression or bipolar disorder may have side effects from using DHEA including mania and irritability [4].

High doses of DHEA may prompt the body to stop making the hormone. High doses may also be toxic to liver cells. At least one case of hepatitis has been reported. People who have liver disease should avoid DHEA [4].

People with diabetes should not take DHEA, because it may increase insulin resistance [4].

At high doses, DHEA may increase the production of the male hormone testosterone. Women should be aware of the risk of developing signs of masculinization. These

include loss of hair on the head, deepening of the voice, growth of hair on the face, weight gain around the waist, or acne. Men should be aware of the risks of too much testosterone, such as shrinkage of the testicles, aggression, male pattern baldness, high blood pressure, and possible higher risk for testosterone-related cancers [4].

Other side effects of high doses of DHEA can include high blood pressure and reduced HDL cholesterol [4].

### **Interactions**

Animal studies suggest that DHEA may strengthen the effects of barbiturates [4].

DHEA may increase the effects of prednisolone, a corticosteroid used to treat inflammation and other disorders [4].

DHEA may affect levels of estrogen and testosterone affecting people who are taking hormone therapy [4]. DHEA may make insulin and drugs used to lower blood sugar less effective, raising the risk of high blood sugar [4].

Drugs that may increase DHEA levels in the body include alprazolam, amlodipine, anastrozole, nifedipine, danocrine, diltiazem, methylphenidate, and metopirone [4].

### **Synergies**

ND

### **Safety Overview**

DHEA at the recommended dose did not induce any significant toxic or adverse effects in human trials. However, it is not recommended for individuals with hormone-related cancers or a family history of these cancers.

### **References**

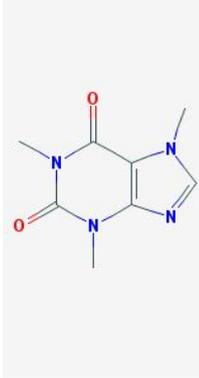
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## PurEnergy® Caffeine pTeroPure® Co-crystal



### Scientific name

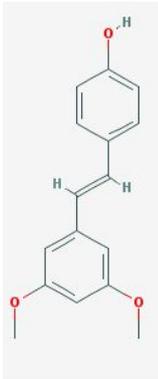
1,3,7-trimethylpurine-2,6-dione (caffeine) +  
4-[(E)-2-(3,5-dimethoxyphenyl)ethenyl]phenol

### Empirical formula

$C_8H_{10}N_4O_2$  (caffeine) +  $C_{16}H_{16}O_3$  (Pterostilbene)

### Primary mechanism

Purinergetic / stimulant



### Dose

209 mg (90 mg caffeine)

### Daily upper limit

300 mg (caffeine)

### Hacker doses

up to 300 mg (caffeine)

**Form:** Pterostilbene slows the absorption rate of caffeine, increases its half-life, delivers up to 30% more total effect, and reduces caffeine crash symptoms

**Product info page:** [Pure Energy \(Pterostilbene bound to Caffeine\)](#)

### Safety

PurEnergy contains ~43% caffeine and ~57% pTeroPure (pterostilbene) delivering 30% more caffeine into the bloodstream and decreasing its absorption, allowing it to act for longer periods of time.

A study in which PurEnergy was administered for 12 weeks reported no adverse side effects [1].

According to the Food and Drug administration, the pharmacological dose of caffeine used to stimulate central nervous system activity in humans is about 3 mg/kg (210 mg for a ~70 kg/150 lb individual) and is observable at about 2 mg/kg. The acute human fatal dose of caffeine appears to be greater than 170 mg/kg (~12000 mg for a ~70 kg/150 lb individual) [2].

According to the European Food Safety Authority, doses of caffeine up to 200 mg/day do not give rise to safety concerns and caffeine consumption up to 400 mg/day does not give rise to safety concerns for non-pregnant adults [3].

Oral administration of caffeine at a dose of 4 mg/kg (280 mg for a ~70 kg/150 lb individual) has been found to increase blood pressure in fasted individuals [2].

Caffeine can cause insomnia, anxiety, irritability, stomach upset, nausea, diarrhea, or frequent urination in some people [4].

Pterostilbene in doses up to 250 mg/day for 6-8 weeks does not cause any biochemical or clinical signs of toxicity, nor any significant side-effects in humans [5].

### **Interactions**

Can potentially interact with disulfiram, clozapine, lorazepam, ciprofloxacin, duloxetine, rasagiline, and tizanidine.

### **Synergies**

Caffeine is synergistic with Theobromine as a CNS stimulant, with faster onset and shorter duration than Theobromine [6].

Caffeine is synergistic with L-Theanine, Pterostilbene, and Quercetin.

### **Safety Overview**

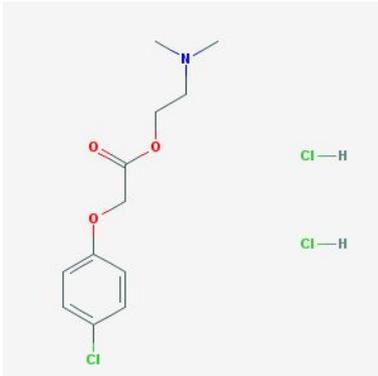
PurEnergy® at the recommended dose delivers caffeine in a dose that does not give rise to safety concerns.

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## Choline Donors

### Centrophenoxine

**Scientific name**

2-(dimethylamino)ethyl  
2-(4-chlorophenoxy)acetate;dihydrochloride

**Empirical formula**

$C_{12}H_{18}Cl_3NO_3$

**Primary mechanism**

Cholinergic

**Dose**

250 mg

**Daily upper limit**

2000 mg

**Hacker doses**

300-1000 mg

**Form:** Ester of dimethylethanolamine (DMAE) and 4-chlorophenoxyacetic acid (pCPA) that significantly decreases the side-effects of DMAE

**Product info page:** [Centrophenoxine](#)

**Safety**

The recommended daily dose of Centrophenoxine is 300-1000 mg [1].

Centrophenoxine administered at a dose of 2000mg/day for 8 weeks showed no adverse side-effects [2].

Centrophenoxine administered at increasing doses of 600-1200 mg/day for 6-12 weeks showed no adverse side-effects [3].

At higher doses, side-effects may include headache, nausea, dizziness, gastrointestinal issues, jaw clenching, and irritability [2].

Centrophenoxine is an ester of dimethylethanolamine (DMAE) and 4-chlorophenoxyacetic acid (pCPA) that significantly decreases the side-effects of DMAE. DMAE has been shown to aggravate or induce the formation of neural tube defects in mice [4]. Centrophenoxine should therefore not be taken during pregnancy.

**Interactions**

Vitamin B5 is used in the synthesis of coenzyme A (CoA), being necessary for the synthesis of acetylcholine [5]. It is therefore synergistic with Centrophenoxine.

Individuals with trimethylaminuria, renal disease, liver disease, depression, and Parkinson's disease may be at risk of adverse effects with choline intakes at the Upper Intake Level [6].

By increasing the levels of choline, Centrophenoxine can potentially interact with cholinergic and anticholinergic drugs.

### **Synergies**

Since Centrophenoxine increases the levels of acetylcholine in the brain [6], its actions are concurrent to those of CDP-choline, Alpha GPC, Acetyl-L-Carnitine, Huperzine A, Vitamin B5, Bacopa Monnieri and Forskolin. However, given the low dose of each ingredient, the overall effect falls within safety limits: the Tolerable Upper Intake Level of choline for adults is 3.5 g/day [7].

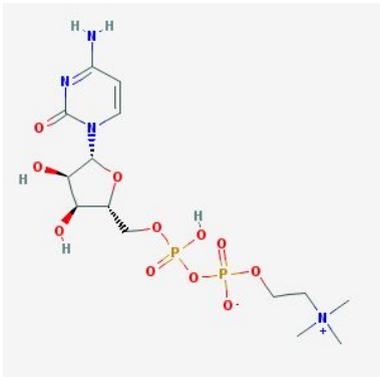
### **Safety Overview**

Centrophenoxine at the recommended dose is considered to be very safe and high in tolerability. No adverse side-effects have been found in human trials using higher doses.

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## CDP Choline (Citicoline)



### Scientific name

[[[(2R,3S,4R,5R)-5-(4-amino-2-oxopyrimidin-1-yl)-3,4-dihydroxyoxolan-2-yl]methoxy-hydroxyphosphoryl] 2-(trimethylazaniumyl)ethyl phosphate

### Empirical formula

$C_{14}H_{26}N_4O_{11}P_2$

### Primary mechanism

Cholinergic

### Dose

75 mg

### Daily upper limit

2000 mg

### Hacker doses

250-1000 mg

**Form:** Water-soluble form with more than 90% oral bioavailability

**Product info page:** [Citicoline](#)

### Safety

The European Food Safety Authority (EFSA) considered a dose of 1000 mg/day of CDP-choline safe for long-term human use [1].

In a study in which 2000 mg/day CDP-choline was given for two months to 32 healthy subjects, no adverse effects related to the administration of CDP-choline were reported [2].

In a CDP-choline tolerance study in which oral doses of 600 or 1 000 mg/day of CDP-choline were administered to healthy volunteers for five days transient headaches were reported. Subjects did not show any other side-effects in terms of hematological or clinical analysis. No clinically significant ECG and EEG abnormalities were observed. Neurological tests, tendon reflexes, mean systemic blood pressure and heart rate were not affected by CDP-choline [3].

In another study in 30 subjects with mild to moderate dementia who received 1000 mg/day of CDP-choline for 12 weeks, no difference in the tolerability of CDP-choline compared to placebo, as measured by physical examination, vital signs, hematology and biochemistry tests, ECG and recording of adverse events were observed [4].

In a meta-analysis investigating the safety and efficacy of CDP-choline, the authors concluded that its overall safety profile for CDP-choline was similar to that of a placebo [5].

In a trial in patients with ischemic stroke, 1140 patients receiving CDP-choline at a dose of 1000 mg every 12 hours intravenously during the first 3 days, and orally thereafter

for a total of 6 weeks, showed no significant differences in the safety variables or in the rate of adverse events relative to the placebo group [6].

### **Interactions**

Vitamin B5 is used in the synthesis of coenzyme A (CoA), being necessary for the synthesis of acetylcholine [7]. It is therefore synergistic with CDP-choline.

Individuals with trimethylaminuria, renal disease, liver disease, depression, and Parkinson's disease may be at risk of adverse effects with choline intakes at the Upper Intake Level [8].

By increasing the levels of choline, CDP-choline can potentially interact with cholinergic and anticholinergic drugs.

### **Synergies**

Uridine is synergistic with CDP-choline: uridine administration increases CDP-choline levels in the brain [9] and CDP-choline increases the levels of uridine [10].

Since CDP-choline increases the levels of choline in the brain, its actions are concurrent to those of Centrophenoxine, Alpha GPC, Acetyl-L-Carnitine, Huperzine A, Vitamin B5, Bacopa Monnieri and Forskolin. However, given the low dose of each ingredient, the overall effect falls within safety limits: the Tolerable Upper Intake Level of choline for adults is 3.5 g/day [8].

CDP-choline has been shown to increase the release of dopamine in the striatum of rats [11]. It may therefore have concurrent effects to those of Mucuna Pruriens, Tyrosine, Phenylalanine, Phenylethylamine, Hordenine, Phosphatidylserine, Rhodiola Rosea, and Vitamin C.

### **Safety Overview**

The European Food Safety Authority considered CDP-choline safe at higher doses. At the recommended dose, it is considered very safe and high in tolerability, with barely any side-effects having been reported in human studies.

### **References**

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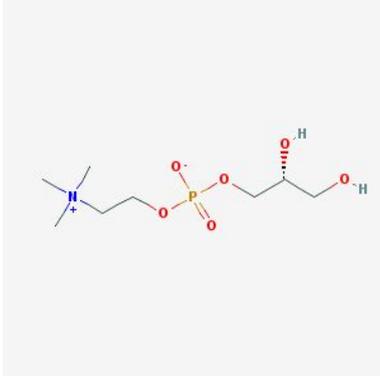
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## Alpha GPC



### Scientific name

[(2R)-2,3-dihydroxypropyl]  
2-(trimethylazaniumyl)ethyl phosphate

### Empirical formula

$C_8H_{20}NO_6P$

### Primary mechanism

Cholinergic

### Dose

100 mg

### Daily upper limit

1200 mg

### Hacker doses

300-1200 mg

**Form:** Alpha-GPC rapidly delivers choline to the brain across the blood–brain barrier and is a biosynthetic precursor of acetylcholine

**Product info page:** [Alpha GPC](#)

### Safety

Alpha GPC at a maximum dose of 196.2 mg/day is generally recognized as safe by the US Food and Drug administration [1].

In a trial using 1000 mg/day of Alpha GPC for 90 days, no adverse reactions were reported and there were no significant changes in blood pressure, heart rate, blood count, blood glucose, lipids, liver and renal function [2].

Alpha GPC administered to older adults at a dose of 1200 mg/day for 180 days showed minor adverse effects in a few subjects, which included constipation and nervousness [1].

In other studies in which Alpha GPC was administered at a dose of 1200 mg/day for 6 months, minor side-effects were reported, including insomnia, gastralgia, restlessness, agitation, heartburn, nausea, headache, insomnia, and orthostatic hypotension [3].

One other study using a dose of 800 mg/day of Alpha GPC for 20 days reported that there were no adverse side effects locally or systemically and that Alpha GPC did not have any interactions with drugs such as digitalis, antihypertensives-diuretics, coronary vasodilators, aminophylline, and antiepileptic drugs [1].

### Interactions

Vitamin B5 is used in the synthesis of coenzyme A (CoA), being necessary for the synthesis of acetylcholine [4]. It is therefore synergistic with Alpha GPC.

Individuals with trimethylaminuria, renal disease, liver disease, depression, and Parkinson's disease may be at risk of adverse effects with choline intakes at the Upper Intake Level [5].

By increasing the levels of choline Alpha GPC can potentially interact with cholinergic and anticholinergic drugs.

Alpha GPC can antagonize the actions of scopolamine [6].

### **Synergies**

Since Alpha GPC increases the levels of choline in the brain, its actions are concurrent to those of Centrophenoxine, CDP-choline, Acetyl-L-Carnitine, Huperzine A, Vitamin B5, Bacopa Monnieri and Forskolin. However, given the low dose of each ingredient, the overall effect falls within safety limits: the Tolerable Upper Intake Level of choline for adults is 3.5 g/day [5].

### **Safety Overview**

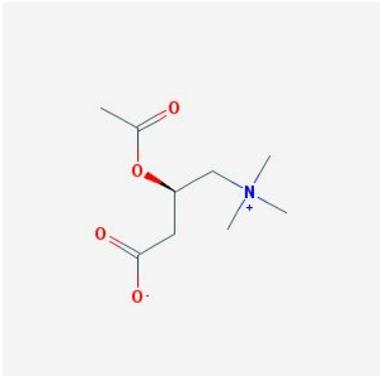
Alpha GPC at the recommended dose is considered to be very safe and high in tolerability, and is generally recognized as safe (GRAS) by the FDA.

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- [6] Sigala S, et al (1992). L-alpha-glycerolphosphorylcholine antagonizes scopolamine-induced amnesia and enhances hippocampal cholinergic transmission in the rat. *Eur J Pharmacol*, 211(3):351-8. PMID: [1319912](#)

## Amino Acids

### Acetyl-L-Carnitine

**Scientific name**

(R)-3-Acetyloxy-4-trimethylammonio-butanoate

**Empirical formula**

$C_9H_{17}NO_4$

**Primary mechanism**

Cholinergic

**Dose**

800 mg

**Daily upper limit**

3000 mg

**Hacker doses**

500-1000 mg

**Form:** Acetylated form of the amino acid L-carnitine: increases the bioavailability of L-carnitine and crosses the blood brain barrier

**Product info page:** [Acetyl-L-Carnitine](#)

**Safety**

Acetyl-L-Carnitine is generally recognized as safe (GRAS) by the FDA, even at high doses [1].

Acetyl-L-Carnitine at dose of 3-4 g/day for 3 months showed no increase in the occurrence of adverse side-effects [2,3].

Few side effects have occurred during treatment with doses as high as 15g daily, other than occasional gastrointestinal disturbances [1].

**Interactions**

Can potentially interact with AZT, doxorubicin, isotretinoin, thyroid hormone, valproic acid, and blood thinning medications.

**Synergies**

In the brain, Acetyl-L-Carnitine originates Acetyl-CoA, which can bind to choline to increase the production of acetylcholine [4].

By increasing the levels of acetylcholine in the brain, its actions are concurrent to those of Centrophoxine, CDP-choline, Alpha-GPC, Huperzine A, Vitamin B5, Bacopa Monnieri and Forskolin. However, given the low dose of each ingredient, the overall effect falls within safety limits.

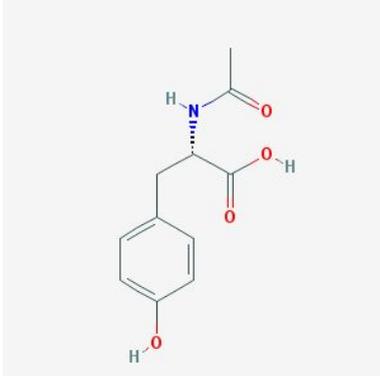
**Safety Overview**

Acetyl-L-Carnitine is generally recognized as safe (GRAS) by the FDA, even at high doses; at the recommended dose few side-effects have occurred in human trials.

## References

- [1] US Food and Drug Administration. GRAS notice: [Levocarnitine](#)
- [2] Hagen K, et al (2015). Acetyl-L-carnitine versus placebo for migraine prophylaxis: A randomized, triple-blind, crossover study. *Cephalalgia*, 35(11):987-95. doi: [10.1177/0333102414566817](https://doi.org/10.1177/0333102414566817)
- [3] Malaguarnera M, et al (2011). Acetyl-L-carnitine improves cognitive functions in severe hepatic encephalopathy: a randomized and controlled clinical trial. *Metab Brain Dis*, 26(4):281-9. doi: [10.1007/s11011-011-9260-z](https://doi.org/10.1007/s11011-011-9260-z)
- [4] Nałecz KA, et al (2004). Carnitine: transport and physiological functions in the brain. *Mol Aspects Med*, 25(5-6):551-67. doi: [10.1016/j.mam.2004.06.001](https://doi.org/10.1016/j.mam.2004.06.001)

## Acetyl-L-Tyrosine



### Scientific name

(2S)-2-acetamido-3-(4-hydroxyphenyl)propanoic acid

### Empirical formula

C<sub>11</sub>H<sub>13</sub>NO<sub>4</sub>

### Primary mechanism

Dopaminergic

### Dose

250 mg

### Daily upper limit

9000 mg

### Hacker doses

1000-5000 mg

**Form:** Acetylated form of the amino acid L-tyrosine: increases the bioavailability of tyrosine

**Product info page:** [N-Acetyl Tyrosine](#)

### Safety

The daily upper requirement of Tyrosine is 14 mg/kg (approximately 1 g/day for an individual weighing 70 kg) [1]. A 250 mg dose of Acetyl-L-Tyrosine therefore falls within the interval of a normal daily dietary requirement of an adult.

A study of L-tyrosine administered at a dose of 9 g/day for 4 weeks showed no noteworthy side-effects [2].

People who have migraine headaches should avoid tyrosine, as it can trigger them [3].

People with hyperthyroidism or Graves disease should avoid tyrosine supplements because it may increase levels of thyroid hormone [4].

### Interactions

Tyrosine's actions can interact with those of MAO inhibitors. Tyrosine may cause an increase in blood pressure in people taking MAO inhibitors. People taking prescribed MAO inhibitors should avoid foods and supplements containing tyrosine [5].

### Synergies

Tyrosine is a Dopamine precursor; it increases the synthesis of dopamine [4].

By increasing the levels of dopamine, Tyrosine's actions are concurrent to those of Mucuna Pruriens, Phenylalanine, Phenylethylamine, Hordenine, Phosphatidylserine, CDP-Choline, Rhodiola Rosea, and Vitamin C. However, given the used doses of each ingredient, the overall effect falls within safety limits.

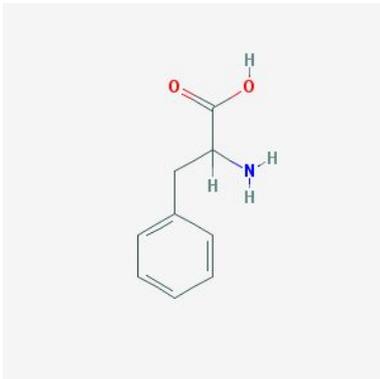
## Safety Overview

N-Acetyl-L-Tyrosine at the recommended dose is within the daily nutritional requirement of tyrosine and is safe. However, Tyrosine has been reported to induce migraines.

## References

- [1] Jongkees BJ, et al (2015). Effect of tyrosine supplementation on clinical and healthy populations under stress or cognitive demands--A review. J Psychiatr Res, 70:50-7. doi: [10.1016/j.ipsychores.2015.08.014](https://doi.org/10.1016/j.ipsychores.2015.08.014)
- [2] Elwes RD, et al (1989). Treatment of narcolepsy with L-tyrosine: double-blind placebo-controlled trial. Lancet, 2(8671):1067-9. doi: [10.1016/S0140-6736\(89\)91081-7](https://doi.org/10.1016/S0140-6736(89)91081-7)
- [3] D'Andrea G, et al (2013). The role of tyrosine metabolism in the pathogenesis of chronic migraine. Cephalalgia, 33(11):932-7. doi: [10.1177/0333102413480755](https://doi.org/10.1177/0333102413480755)
- [4] Fernstrom JD & Fernstrom MH (2007). Tyrosine, phenylalanine, and catecholamine synthesis and function in the brain. J Nutr, 137(6 Suppl 1):1539S-1547S. PMID: [17513421](https://pubmed.ncbi.nlm.nih.gov/17513421/)
- [5] University of Maryland Medical Center. Complementary and Alternative Medicine Guide. [Tyrosine](#)

## DLPA



### Scientific name

2-amino-3-phenylpropanoic acid

### Empirical formula

$C_9H_{11}NO_2$

### Primary mechanism

Dopaminergic

### Dose

300 mg

### Daily upper limit

1000 mg

### Hacker doses

100-500 mg

**Form:** DLPA is a mixture of two forms of the essential amino acid phenylalanine (the naturally occurring L-phenylalanine and the synthetic D-phenylalanine) that crosses the blood-brain barrier more easily

**Product info page:** [DL-Phenylalanine](#)

### Safety

DL-phenylalanine may be toxic and cause nerve damage at doses higher than 5000 mg/day [1].

In a study using DL-phenylalanine at a dose of up to 1200 mg/day, no adverse side-effects were reported [2].

High quantities of DL-phenylalanine may cause mild side effects such as nausea, heartburn, headaches, as well as symptoms of anxiety [1].

People with phenylketonuria, and women who are breastfeeding or are pregnant, should not take phenylalanine supplements [1].

### Interactions

L-phenylalanine can be converted to Phenylethylamine [3]. Phenylethylamine increases the levels of dopamine in the brain, particularly when combined with MAO-B inhibitors such as Hordenine. L-phenylalanine thereby potentiates the actions of those ingredients.

On the other hand, it has been suggested that phenylalanine may reduce the absorption of L-DOPA [1], thereby counterbalancing an increase in dopamine levels.

Phenylalanine's actions can interact with those of MAO inhibitors. Taking phenylalanine while taking prescribed MAO inhibitors may cause an increase in blood pressure [1].

Phenylalanine may reduce absorption of baclofen, a medication used to relieve muscle spasms [1].

DL-phenylalanine should not be used in people taking antipsychotic drugs, as it may cause or worsen symptoms of tardive dyskinesia - involuntary movements of the tongue, lips, face, trunk, and limbs that can occur in people taking antipsychotic drugs long term [1].

### **Synergies**

By increasing the levels of dopamine, DL-phenylalanine's actions are concurrent to those of Mucuna Pruriens, Phenylethylamine, Hordenine, Phosphatidylserine, CDP-Choline, Tyrosine, Rhodiola Rosea, and Vitamin C. However, given the used doses of each ingredient, the overall effect falls within safety limits.

### **Safety Overview**

Although human trials are limited, DL-Phenylalanine at the recommended dose has shown no adverse effects. Phenylalanine is contraindicated for individuals with phenylketonuria.

### **References**

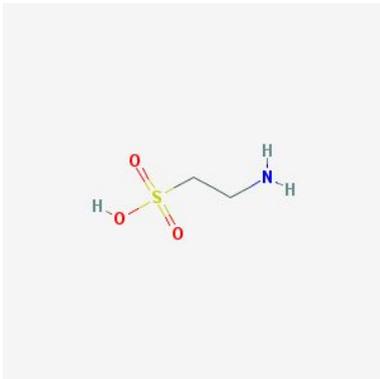
[1] University of Maryland Medical Center. Complementary and Alternative Medicine Guide.

[Phenylalanine](#)

[2] Wood DR, et al (1985). Treatment of attention deficit disorder with DL-phenylalanine. Psychiatry Res, 16(1):21-6. PMID: [10.1016/0165-1781\(85\)90024-1](#)

[3] Marcobal A, et al (2012). Tyramine and phenylethylamine biosynthesis by food bacteria. Crit Rev Food Sci Nutr. 2012; 52(5):448-67. doi: [10.1080/10408398.2010.500545](#)

## L-Taurine



### Scientific name

2-aminoethanesulfonic acid

### Empirical formula

C<sub>2</sub>H<sub>7</sub>NO<sub>3</sub>S

### Primary mechanism

GABAergic

### Dose

500 mg

### Daily upper limit

3000 mg

### Hacker doses

up to 3000 mg

**Form:** Naturally occurring amino acid

**Product info page:** [Taurine](#)

### Safety

L-Taurine is considered safe up to a dose of 3000 mg/day in supplemental form [1].

A dose of 1000 mg/day for 20 weeks has been tested with no adverse side effects being reported [2]. A higher dose of 6000 mg/day for 4 weeks has also been tested with no adverse side effects being noted [3].

### Interactions

ND

### Synergies

ND

### Safety Overview

L-Taurine is safe and does not produce adverse health effects even at high doses, according to the European Food Safety Authority. Excess taurine is excreted by the kidneys.

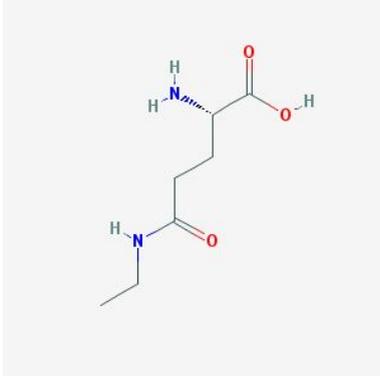
### References

[1] Shao A, et al (2008). Risk assessment for the amino acids taurine, L-glutamine and L-arginine. Regul Toxicol Pharmacol, 50(3):376-99. doi: [10.1016/j.yrtph.2008.01.004](https://doi.org/10.1016/j.yrtph.2008.01.004)

[2] Sirdah, MM, et al (2002). Possible ameliorative effect of taurine in the treatment of iron-deficiency anaemia in female university students of Gaza, Palestine. Eur. J. Haematol, 69:236–242. doi: [10.1034/j.1600-0609.2002.02722.x](https://doi.org/10.1034/j.1600-0609.2002.02722.x)

[3] Azuma J, et al (1985). Therapeutic effect of taurine in congestive heart failure: a double blind crossover trial. Clin Cardiol, 8:276–282. doi: [10.1002/clc.4960080507](https://doi.org/10.1002/clc.4960080507)

## L-Theanine



### Scientific name

(2S)-2-amino-5-(ethylamino)-5-oxopentanoic acid

### Empirical formula

C<sub>7</sub>H<sub>14</sub>N<sub>2</sub>O<sub>3</sub>

### Primary mechanism

Purinergic

### Dose

200 mg

### Daily upper limit

1000 mg

### Hacker doses

200-800 mg

**Form:** Naturally occurring form extracted from *Camellia sinensis*; crosses the blood-brain barrier

**Product info page:** [L-Theanine](#)

### Safety

Theanine at a dose of 920 mg/day has been generally recognized as safe by the US Food and Drug Administration [1].

In mice, the maximum tolerated dose of L-theanine was determined to be 6300 mg/kg/day for males and 5150 mg/kg/day for females [1], corresponding to approximately 400-500 mg/kg/day in humans [2].

### Interactions

ND

### Synergies

Synergistic with caffeine.

### Safety Overview

L-Theanine at the recommended dose is generally recognized as safe (GRAS) by the FDA.

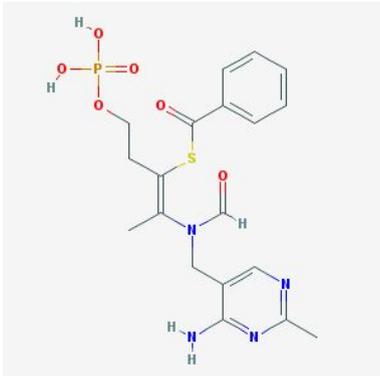
### References

[1] US Food and Drug Administration. Division of Biotechnology and GRAS Notice Review (HFS-255). Office of Premarket Approval. Center for Food Safety and Applied Nutrition. Determination of the GRAS Status of Suntheanine ~ L-Theanine for Use in Food. [February 2006](#)

[2] Food and Drug Administration (2005). Guidance for Industry Estimating the Maximum Safe Starting Dose in Initial Clinical Trials for Therapeutics in [Adult Healthy Volunteers](#).

## Neuro-Vitamins

### Vit B1 as Benfotiamine



#### Scientific name

S-[(Z)-2-[(4-amino-2-methylpyrimidin-5-yl)methyl-formylamino]-5-phosphonooxypent-2-en-3-yl]benzenecarbothioate

#### Empirical formula

$C_{19}H_{23}N_4O_6PS$

#### Primary mechanism

Cellular metabolism

#### Dose

100 mg

#### Daily upper limit

ND 300 mg

#### Hacker doses

50-300 mg

**Form:** Synthetic S-acyl derivative of thiamine: 5-fold higher bioavailability than thiamine

**Product info page:** [Vit B1 as Benfotiamine](#)

#### Safety

Only a small percentage of a high dose of Vitamin B1 is absorbed, and elevated serum values result in active urinary excretion of the vitamin [1].

Because there is insufficient data for a risk assessment, no Tolerable Upper Intake Level has been determined for thiamin [2,3].

There are no reports of adverse effects from consumption of excess thiamin by ingestion of food and supplements [2], even at dosages of several hundred milligrams a day [3].

#### Interactions

Not known to interact with any medications [4].

#### Synergies

ND

#### Safety Overview

There are no reports of adverse effects from consumption of thiamine, even at high doses. Benfotiamine at the recommended dose is considered safe.

#### References

[1] Davis RE, et al (1984). Intestinal absorption of thiamin in man compared with folate and pyridoxal and its subsequent urinary excretion. J Nutr Sci Vitaminol (Tokyo), 30(5):475-82. PMID: [6527154](#)

[2] Institute of Medicine. Food and Nutrition Board (1998). Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline. Washington (DC): National Academies Press (US). doi: [10.17226/6015](#)

[3] Scientific Committee on Food and Scientific Panel on Dietetic Products, Nutrition and Allergies (2006). Tolerable Upper Intake Levels For Vitamins And Minerals. [European Food Safety Authority](#)

[4] National Institutes of Health, Office of Dietary Supplements. Dietary Supplement Fact Sheets. [Vitamin B1](#)

## Vit B3 as Niacinamide



### Scientific name

pyridine-3-carboxamide

### Empirical formula

C<sub>6</sub>H<sub>6</sub>N<sub>2</sub>O

### Primary mechanism

Cellular metabolism

### Dose

50 mg

### Daily upper limit

900 mg

### Hacker doses

100-300 mg

**Form:** Niacinamide is the amide form of vitamin B3 (nicotinic acid / niacin); significantly decreases the occurrence of the adverse side-effects of nicotinic acid

**Product info page:** [Vit B3 as Niacinamide](#)

### Safety

Transient vasodilation (flushing) and hypotension are commonly seen after intake of high doses of nicotinic acid but **not of niacinamide** [1].

Nicotinic acid has a number of other adverse side-effects, including gastrointestinal effects and hepatotoxicity, which are **not observed with niacinamide** [1].

The Food and Nutrition Board of the U.S. Institute of Medicine defined the Tolerable Upper Intake Level for **nicotinic acid** for adults as 35 mg/day. However, this was based on vasodilation as the critical adverse effect. Although niacinamide appears not to be associated with flushing effects, an Upper Intake Level for nicotinic acid that is based on flushing is considered protective against potential adverse effects of niacinamide [2].

The European Food Safety Authority, on the other hand, defined the Tolerable Upper Intake Level for nicotinic acid for adults as 10 mg/day, but determined that **niacinamide has no significant adverse effects**; the Tolerable Upper Intake Level for **niacinamide** was defined as 900 mg/day for adults [1].

### Interactions

Can potentially interact with mipomersen, lomitapide, leflunomide, teriflunomide.

### Synergies

ND

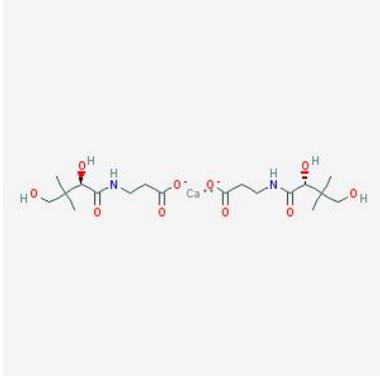
## **Safety Overview**

Niacinamide at the recommended dose is safe with no significant adverse effects.

## **References**

- [1] Scientific Committee on Food and Scientific Panel on Dietetic Products, Nutrition and Allergies (2006). Tolerable Upper Intake Levels For Vitamins And Minerals. [European Food Safety Authority](#)
- [2] Institute of Medicine. Food and Nutrition Board (1998). Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline. Washington (DC): National Academies Press (US). doi: [10.17226/6015](#)

## Vit B5 as Calcium Pantothenate



### Scientific name

calcium;3-[[[(2R)-2,4-dihydroxy-3,3-dimethylbutanoyl]amino]propanoate

### Empirical formula

C<sub>18</sub>H<sub>32</sub>CaN<sub>2</sub>O<sub>10</sub>

### Primary mechanism

Cholinergic

### Dose

850 mg

### Daily upper limit

ND

### Hacker doses

500-1,500 mg

**Form:** Calcium D-pantothenate salt: more stable than pantothenic acid

**Product info page:** [Vit B5 as Calcium Pantothenate](#)

### Safety

No adverse effects have been associated with high intakes of vitamin B5 [1,2].

A Tolerable Upper Intake Level for vitamin B5 has not been determined [1,2].

Intakes considerably in excess do not represent a health risk for the general population [2].

### Interactions

Vitamin B5 is used in the synthesis of coenzyme A (CoA), being necessary for the synthesis of acetylcholine [3].

Vitamin B5 may interact with cholinergic and anticholinergic drugs.

### Synergies

Since Vitamin B5 increases the levels of choline in the brain, its actions are concurrent to those of Centrophenoxine, Alpha GPC, Acetyl-L-Carnitine, Huperzine A, and CDP-Choline, Bacopa Monnieri and Forskolin.

### Safety Overview

Calcium pantothenate is very safe, with no adverse effects even at high doses; very safe at the recommended dose.

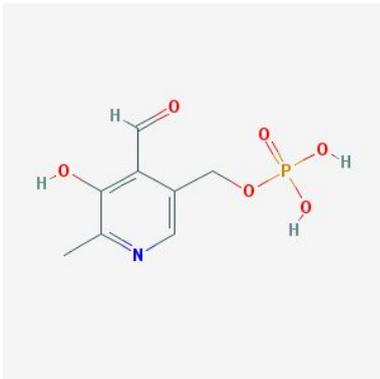
## References

[1] Institute of Medicine. Food and Nutrition Board (1998). Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline. Washington (DC): National Academies Press (US). doi: [10.17226/6015](https://doi.org/10.17226/6015)

[2] Scientific Committee on Food and Scientific Panel on Dietetic Products, Nutrition and Allergies (2006). Tolerable Upper Intake Levels For Vitamins And Minerals. [European Food Safety Authority](https://www.efsa.europa.eu/en/efsajournal/doc/1112/1112.pdf)

[3] Tahiliani AG, Beinlich CJ (1991). Pantothenic acid in health and disease. *Vitam Horm*, 46:165-228. doi: [10.1016/S0083-6729\(08\)60684-6](https://doi.org/10.1016/S0083-6729(08)60684-6)

## Vit B6 as Pyridoxal-5-Phosphate (P-5-P)



### Scientific name

(4-formyl-5-hydroxy-6-methylpyridin-3-yl)methyl dihydrogen phosphate

### Empirical formula

$C_8H_{10}NO_6P$

### Primary mechanism

Cellular metabolism

### Dose

20 mg

### Daily upper limit

100 mg

### Hacker doses

10-100 mg

**Form:** P-5-P is the active, naturally occurring form of vitamin B6

**Product info page:** [Vit B6 as Pyridoxal-5-Phosphate](#)

### Safety

The Tolerable Upper Intake Level for adults is 100 mg/day of vitamin B6, as defined by the Food and Nutrition Board of the US Institute of Medicine [1].

The European Food Safety Authority set its Tolerable Upper Intake Level at 25 mg/day [2].

The principal toxicity of concern associated with excessive intakes of vitamin B6 is neuronal damage, and sensory and motor effects. This has only been associated with extremely high intakes (above 500 mg/day) [2].

Shooting and tingling pains, paraesthesia of limbs, clumsiness, ataxia or peri-oral numbness was reported after an intake ranging from 50-300 mg per day [2].

### Interactions

ND

### Synergies

ND

### Safety Overview

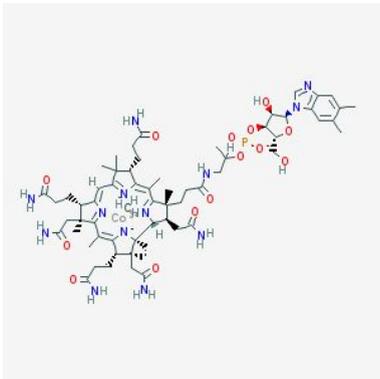
P-5-P at the recommended dose is below the Tolerable Upper Intake Level and has shown no adverse effects.

## References

[1] Institute of Medicine. Food and Nutrition Board (1998). Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline. Washington (DC): National Academies Press (US). doi: [10.17226/6015](https://doi.org/10.17226/6015)

[2] Scientific Committee on Food and Scientific Panel on Dietetic Products, Nutrition and Allergies (2006). Tolerable Upper Intake Levels For Vitamins And Minerals. [European Food Safety Authority](https://www.efsa.europa.eu/en/efsajournal/doc/1112/1112.pdf)

## Vit B12 as Methylcobalamin



### Scientific name

carbanide;cobalt(3+);[(2R,3S,4R,5S)-5-(5,6-dimethylbenzimidazol-1-yl)-4-hydroxy-2-(hydroxymethyl)oxolan-3-yl] 1-[3-[(1R,2R,3R,5Z,7S,10Z,12S,13S,15Z,17S,18S,19R)-2,13,18-tris(2-amino-2-oxoethyl)-7,12,17-tris(3-amino-3-oxopropyl)-3,5,8,8,13,15,18,19-octamethyl-2,7,12,17-tetrahydro-1H-corrin-24-id-3-yl]propanoylamino]propan-2-yl phosphate

### Empirical formula

$C_{63}H_{91}CoN_{13}O_{14}P$

### Primary mechanism

Cellular metabolism

### Dose

1 mg

### Daily upper limit

5 mg

### Hacker doses

0.1-5 mg

**Form:** Methylated cobalamin is the metabolically active form of vitamin b12

**Product info page:** [Vit B12 as Methylcobalamin](#)

### Safety

No adverse effects have been associated with excess B12 intake from food or supplements in healthy individuals. [1]

When high doses are given orally, only a small percentage of B12 can be absorbed from the gastrointestinal tract, which may explain its low toxicity [1].

The data on adverse effects of B12 intake were considered not sufficient for a dose-response assessment and definition of a Tolerable Upper Intake Level [1,2].

Vitamin B12 supplementation did not cause any serious adverse events when administered at doses of 1.0 mg for 5 years [3,4].

Vitamin B12 has a history of safe long-term use at doses between 1-5 mg for treatment of disorders associated with impaired vitamin B12 absorption, with no evidence of adverse effects [2].

### Interactions

Chloramphenicol is a bacteriostatic antibiotic. Limited evidence from case reports indicates that chloramphenicol can interfere with the red blood cell response to supplemental vitamin B12 in some patients [4].

### Synergies

ND

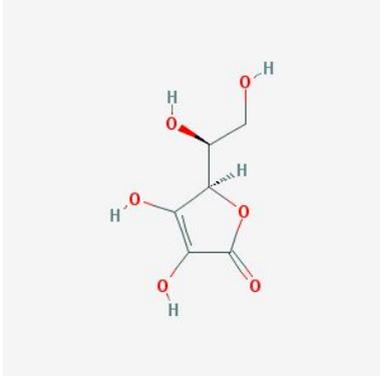
## **Safety Overview**

Methylcobalamin has shown no adverse effects even when consumed in excess by healthy individuals.

## **References**

- [1] Institute of Medicine. Food and Nutrition Board (1998). Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline. Washington (DC): National Academies Press (US). doi: [10.17226/6015](https://doi.org/10.17226/6015)
- [2] Scientific Committee on Food and Scientific Panel on Dietetic Products, Nutrition and Allergies (2006). Tolerable Upper Intake Levels For Vitamins And Minerals. [European Food Safety Authority](https://www.efsa.europa.eu/en/efsajournal/doc/1112/annex-1)
- [3] Lonn E, et al (2006). Homocysteine lowering with folic acid and B vitamins in vascular disease. N Engl J Med, 354(15):1567-77. doi: [10.1056/NEJMoa060900](https://doi.org/10.1056/NEJMoa060900)
- [4] National Institutes of Health, Office of Dietary Supplements. Dietary Supplement Fact Sheets. [Vitamin B12](https://ods.od.nih.gov/factsheets/VitaminB12/)

## Vit C as Ascorbic Acid



### Scientific name

(2R)-2-[(1S)-1,2-dihydroxyethyl]-3,4-dihydroxy-2H-furan-5-one

### Empirical formula

$C_6H_8O_6$

### Primary mechanism

Antioxidant / Dopaminergic

### Dose

250 mg

### Daily upper limit

2000 mg

### Hacker doses

up to 10,000 mg

**Form:** Naturally occurring form

**Product info page:** [Vit C as Ascorbic Acid](#)

### Safety

The Tolerable Upper Intake Level for adults is 2000 mg/day of vitamin C, as defined by the Food and Nutrition Board (FNB) of the U.S. Institute of Medicine [1].

Vitamin C is of low acute toxicity as indicated by the limited data available from studies in animals and humans [2].

Adverse effects have been reported primarily after very large doses (greater than 3 g/day) [1].

Gastrointestinal and renal effects have been observed with doses above 1 g/day, with gastrointestinal intolerance being the most clearly defined adverse effect at high intakes. The available human data suggest that supplemental daily doses of vitamin C up to about 1 g in addition to normal dietary intakes are not associated with adverse gastrointestinal effects, but that acute gastrointestinal effects may occur at higher intakes (3-4 g/day) [2].

### Interactions

The safety and efficacy of the use of vitamin C and other antioxidants during cancer treatment is controversial. Individuals undergoing chemotherapy or radiation should consult with their oncologist prior to taking vitamin C or other antioxidant supplements, especially in high doses [3].

### Synergies

Vitamin C is a cofactor for dopamine- $\beta$ -hydroxylase; it optimizes the production of dopamine, adrenaline and noradrenaline [4].

By increasing the levels of dopamine, Vitamin C's actions are concurrent to those of Mucuna Pruriens, Tyrosine, Phenylalanine, Phenylethylamine, Hordenine, Phosphatidylserine, CDP-Choline, and Rhodiola Rosea. However, given the doses of each ingredient, the overall effect falls within safety limits.

### **Safety Overview**

Ascorbic acid at the recommended dose is below the Tolerable Upper Intake Level and has shown no adverse side-effects. However, it is not recommended for individuals undergoing chemotherapy or radiation therapy.

### **References**

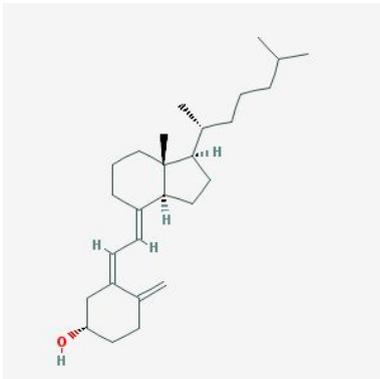
[1] Institute of Medicine. Food and Nutrition Board (2000). Dietary Reference Intakes for Vitamin C, Vitamin E, Selenium, and Carotenoids. Washington (DC): National Academies Press (US). doi: [10.17226/9810](https://doi.org/10.17226/9810)

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[3] National Institutes of Health, Office of Dietary Supplements. Dietary Supplement Fact Sheets. [Vitamin C](https://ods.od.nih.gov/factsheets/VitaminC/)

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## Vit D3 as Microencapsulated Cholecalciferol



### Scientific name

(1S,3Z)-3-[(2E)-2-[(1R,3aS,7aR)-7a-methyl-1-[(2R)-6-methylheptan-2-yl]-2,3,3a,5,6,7-hexahydro-1H-inden-4-ylidene]ethylidene]-4-methylidenecyclohexan-1-ol

### Empirical formula

$C_{27}H_{44}O$

### Primary mechanism

Cellular metabolism

### Dose

2000 IU

### Daily upper limit

4000 IU

### Hacker doses

2,000-20,000 IU

**Form:** Cholecalciferol is an inactive form of vitamin D (vitamin D3) that is well absorbed and converted to an active form in the body

**Product info page:** [Vit D3 as Microencapsulated Cholecalciferol](#)

### Safety

The Tolerable Upper Intake Level for adults is 4000 IU/day (100 mcg) of vitamin D3, as defined by the Food and Nutrition Board of the US Institute of Medicine [1].

The European Food Safety Authority set its Tolerable Upper Intake Level at 2000 IU/day (50 mcg) [2].

The hallmark of vitamin D intoxication is hypercalcemia. Vitamin D intoxication generally presents with non-specific symptoms that may vary and often include anorexia, weight loss, polyuria, and heart arrhythmias. The condition eventually leads to vascular and tissue calcification with subsequent renal and cardiovascular damage [1].

Excessive vitamin D3 intake has been associated with increased all-cause mortality, some cancers, cardiovascular disease risk, and risk of falls and fractures [1].

It is unlikely to observe symptoms of toxicity at daily intakes below 10,000 IU, while it is possible that daily intakes above 10,000 IU could be associated with toxicity [3].

### Interactions

Calcitriol, doxercalciferol, paricalcitol.

### Synergies

ND

## **Safety Overview**

Cholecalciferol at the recommended dose is below the Tolerable Upper Intake Level and has shown no adverse side-effects.

## **References**

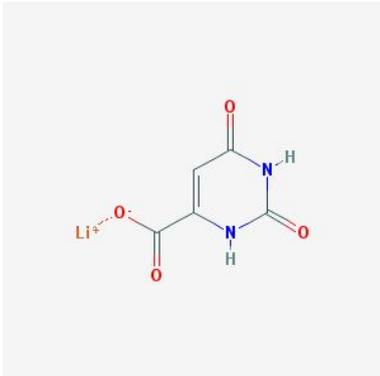
[1] Institute of Medicine. Food and Nutrition Board (2011). Dietary Reference Intakes for Calcium and Vitamin D. Washington (DC): National Academies Press (US). doi: [10.17226/13050](https://doi.org/10.17226/13050)

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[3] National Institutes of Health, Office of Dietary Supplements. Dietary Supplement Fact Sheets. [Vitamin D](https://ods.od.nih.gov/factsheets/VitaminD/)

## Neuro-Minerals

### Lithium Orotate

**Scientific name**

lithium;2,4-dioxo-1H-pyrimidine-6-carboxylate

**Empirical formula**

$C_5H_3LiN_2O_4$

**Primary mechanism**

Cellular metabolism

**Dose**

3 mg

**Daily upper limit**

150 mg

**Hacker doses**

up to 120 mg

**Form:** Orotate chelate: increases the bioavailability of lithium

**Product info page:** [Lithium Orotate](#)

**Safety**

Low-dose lithium is regarded as safe. A 3 mg dose of lithium orotate falls within the interval of a normal daily dietary lithium intake of an adult [1].

The orotate chelate increases the bioavailability of lithium. Low doses of the orotate may achieve effective brain lithium concentrations while avoiding toxic lithium concentrations in the serum [2].

Long-term administration of lithium orotate at a dose of 150 mg/day was shown to be safe with a very low incidence of side effects. When present, side-effects were minor and included muscle weakness, loss of appetite or mild apathy [3].

**Interactions**

Can potentially interact with carbamazepine, fluoxetine, metronidazole, potassium iodide thyroid medication, heart or blood pressure medication, and NSAIDs.

**Synergies**

ND

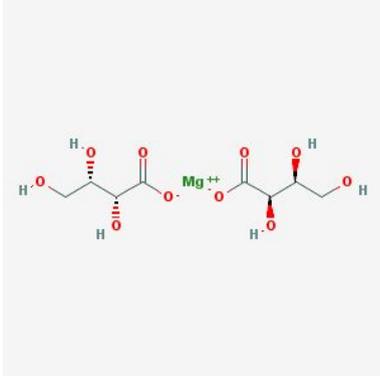
**Safety Overview**

Lithium orotate at the recommended dose is safe. This low dose achieves effective brain lithium concentrations while avoiding lithium's side-effects.

## References

- [1] Schrauzer GN (2002). Lithium: occurrence, dietary intakes, nutritional essentiality. *J Am Coll Nutr*, 21(1):14-21. doi: [10.1080/07315724.2002.10719188](https://doi.org/10.1080/07315724.2002.10719188)
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## Magnesium Threonate



### Scientific name

magnesium;(2R,3S)-2,3,4-trihydroxybutanoate

### Empirical formula

C<sub>8</sub>H<sub>14</sub>MgO<sub>10</sub>

### Primary mechanism

Glutamatergic

### Dose

75 mg

### Daily upper limit

350 mg

### Hacker doses

up to 400 mg

**Form:** L-Threonate salt: increases the bioavailability of magnesium

**Product info page:** [Magnesium Threonate](#)

### Safety

The Tolerable Upper Intake Level of magnesium for adults is 350 mg/day, as defined by the Food and Nutrition Board [1].

The European Food Safety Authority set its Tolerable Upper Intake Level at 250 mg/day [2].

High doses of magnesium from dietary supplements often result in diarrhea that can be accompanied by nausea and abdominal cramping [1]. Mild and transient diarrhea occurs in a small percentage of adults taking oral doses above 350 mg/day [2].

Very large doses of magnesium (**more than 5,000 mg/day**) have been associated with magnesium toxicity. Symptoms of magnesium toxicity can include hypotension, nausea, vomiting, facial flushing, retention of urine, ileus, depression, and lethargy before progressing to muscle weakness, difficulty breathing, extreme hypotension, irregular heartbeat, and cardiac arrest [3].

### Interactions

Magnesium-rich supplements can decrease the absorption of oral bisphosphonates, such as alendronate, used to treat osteoporosis. Use of magnesium-rich supplements or medications and oral bisphosphonates should be separated by at least 2 hours [3].

Magnesium can form insoluble complexes with tetracyclines, such as demeclocycline and doxycycline, as well as quinolone antibiotics, such as ciprofloxacin and levofloxacin. These antibiotics should be taken at least 2 hours before or 4–6 hours after a magnesium-containing supplement [3].

## **Synergies**

ND

## **Safety Overview**

Magnesium threonate at the recommended dose is below the Tolerable Upper Intake Level and has shown no adverse side-effects. Although doses are very low, it should be kept in mind that magnesium may not be recommended for individuals with kidney diseases.

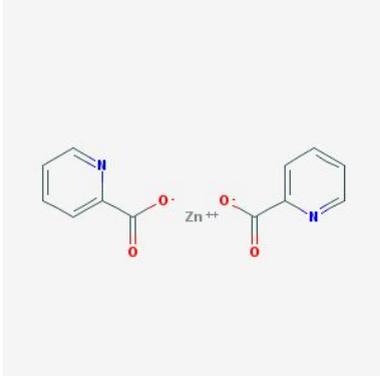
## **References**

[1] Institute of Medicine. Food and Nutrition Board (1997). Dietary Reference Intakes: Calcium, Phosphorus, Magnesium, Vitamin D and Fluoride. Washington, DC: National Academy Press. doi: [10.17226/5776](https://doi.org/10.17226/5776)

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[3] National Institutes of Health, Office of Dietary Supplements. Dietary Supplement Fact Sheets. [Magnesium](https://ods.od.nih.gov/factsheets/magnesium/)

## Zinc Picolinate



### Scientific name

zinc;pyridine-2-carboxylate

### Empirical formula

C<sub>12</sub>H<sub>8</sub>N<sub>2</sub>O<sub>4</sub>Zn

### Primary mechanism

Cellular metabolism

### Dose

15 mg

### Daily upper limit

40 mg

### Hacker doses

up to 100 mg

**Form:** Picolinate salt: increases the absorption of zinc

**Product info page:** [Zinc Picolinate](#)

### Safety

The Tolerable Upper Intake Level of zinc for adults is 40 mg/day, as defined by the Food and Nutrition Board [1].

The European Food Safety Authority set its Tolerable Upper Intake Level at 25 mg/day [2].

The most prominent effects of acute zinc toxicity are gastrointestinal disturbances. Acute adverse effects of high zinc intake include nausea, vomiting, loss of appetite, abdominal cramps, diarrhea, and headaches [3].

Intakes of more than 150 mg/day of zinc for long periods have been associated with such chronic effects as low copper status, altered iron function, reduced immune function, and reduced levels of high-density lipoproteins [2].

### Interactions

Both quinolone antibiotics and tetracycline antibiotics interact with zinc in the gastrointestinal tract, inhibiting the absorption of both zinc and the antibiotic. Taking the antibiotic at least 2 hours before or 4–6 hours after taking a zinc supplement minimizes this interaction [3].

Zinc can reduce the absorption and action of penicillamine, a drug used to treat rheumatoid arthritis. To minimize this interaction, individuals should take zinc supplements at least 2 hours before or after taking penicillamine [3].

## Synergies

ND

## Safety Overview

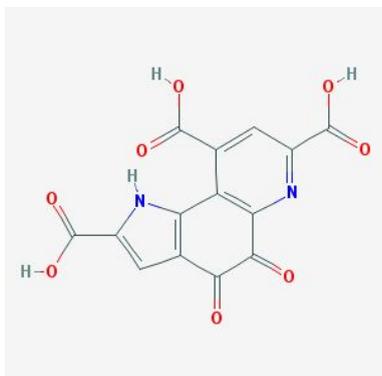
Zinc picolinate at the recommended dose is below the Tolerable Upper Intake Level and has shown no adverse side-effects.

## References

- [1] Institute of Medicine. Food and Nutrition Board (2001). Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc. Washington, DC: National Academy Press. doi: [10.17226/10026](https://doi.org/10.17226/10026)
- [2] Scientific Committee on Food and Scientific Panel on Dietetic Products, Nutrition and Allergies (2006). Tolerable Upper Intake Levels For Vitamins And Minerals. [European Food Safety Authority](https://www.efsa.europa.eu/en/efsajournal/doc/1112/1112.pdf)
- [3] National Institutes of Health, Office of Dietary Supplements. Dietary Supplement Fact Sheets. [Zinc](https://ods.od.nih.gov/factsheets/Zinc/)

## Neuro-Anti-Inflammatories and Antioxidants

### BioPQQ

**Scientific name**

4,5-dioxo-1H-pyrrolo[2,3-f]quinoline-2,7,9-tricarboxylic acid

**Empirical formula**

$C_{14}H_6N_2O_8$

**Primary mechanism**

Cellular metabolism

**Dose**

10 mg

**Daily upper limit**

60 mg

**Hacker doses**

10-50 mg

**Form:** Naturally occurring enzyme cofactor

**Product info page:** [BioPQQ](#)

**Safety**

No adverse effects of dietary supplements containing PQQ have been reported [1].

PQQ does not accumulate considerably in the body to produce severe damage; its effect is transient [1].

Safety studies in healthy humans have shown that doses of 20 or 60 mg/day of PQQ over four weeks induced no adverse effects [2].

Subjects given 20 mg/day of BioPQQ for 12 weeks indicated no abnormal blood or urinary adverse events, nor adverse internal or physical examination findings [3].

In oral toxicity studies in rats, a 13-week subchronic administration study determined a no-observed-adverse effect level (NOAEL) of 100 mg /kg body weight of PQQ [4], whereas another study indicated that a dose of 400 mg/kg body weight over the same time period as safe [5].

**Interactions**

ND

**Synergies**

ND

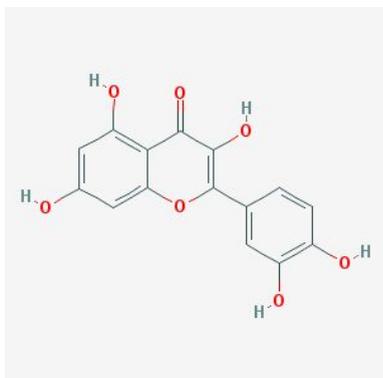
## **Safety Overview**

BioPQQ at the recommended dose does not accumulate considerably in the body to produce severe damage; its effect is transient and this dose has shown no adverse side-effects in human trials.

## **References**

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- [5] Liang C, et al (2015). A subchronic oral toxicity study on pyrroloquinoline quinone (PQQ) disodium salt in rats. *Food Chem Toxicol*, 75:146-50. doi: [10.1016/j.fct.2014.11.005](https://doi.org/10.1016/j.fct.2014.11.005)

## Quercetin



### Scientific name

2-(3,4-dihydroxyphenyl)-3,5,7-trihydroxychromen-4-one

### Empirical formula

$C_{15}H_{10}O_7$

### Primary mechanism

Purinergetic

### Dose

200 mg

### Daily upper limit

ND 1000 mg

### Hacker doses

up to 2000 mg

**Form:** Naturally occurring form

**Product info page:** [Quercetin](#)

### Safety

Quercetin is generally considered to be safe, with no noteworthy adverse health effects, being unlikely that administration of quercetin at a typical dosage could cause any adverse effect [1,2].

Quercetin orally ingested for periods of up to 12 weeks at dose levels ranging between 3 and 1000 mg/day, showed no compound-related adverse effects, including the absence of any variations in hematology, clinical chemistry, and urinalysis parameters [3-5].

A phase I clinical trial using doses of quercetin of 1.5–51.3 mg/kg body weight showed that dose levels of up to 10.8 mg/kg body weight (756 mg) induced no adverse effects. At the higher dose levels of up to 51.3 mg/kg body weight (3591 mg), dyspnea, emesis, and nephrotoxicity were reported; however, the clinical symptoms lasted only a short period of time [6].

Quercetin supplementation in a dose of 500 mg twice per day for one month also didn't show any adverse effects [7].

### Interactions

Can potentially interact with anticoagulants, fluoroquinolones, taxol/paclitaxel, vincristine, and cyclosporine.

### Synergies

Adenosine receptor antagonist [8]; synergistic with caffeine.

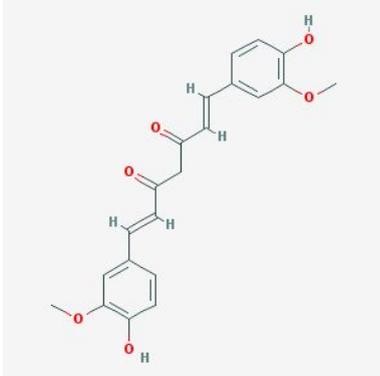
## **Safety Overview**

Quercetin at the recommended dose is generally considered to be safe with no noteworthy adverse health effects; human trials have reported no adverse effects even at higher doses.

## **References**

- [1] Harwood M, et al (2007). A critical review of the data related to the safety of quercetin and lack of evidence of in vivo toxicity, including lack of genotoxic/carcinogenic properties. *Food Chem Toxicol*, 45(11):2179-205. doi: [10.1016/j.fct.2007.05.015](https://doi.org/10.1016/j.fct.2007.05.015)
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- [7] Katske F, et al (2001). Treatment of interstitial cystitis with a quercetin supplement. *Tech Urol*, 7(1):44-6. PMID: [11272677](https://pubmed.ncbi.nlm.nih.gov/11272677/)
- [8] Olson CA, et al (2010). Effects of 2 adenosine antagonists, quercetin and caffeine, on vigilance and mood. *J Clin Psychopharmacol*, 30(5):573-8. doi: [10.1097/JCP.0b013e3181ee0f79](https://doi.org/10.1097/JCP.0b013e3181ee0f79)

## Curcumin



### Scientific name

(1E,6E)-1,7-bis(4-hydroxy-3-methoxyphenyl)hepta-1,6-diene-3,5-dione

### Empirical formula

$C_{21}H_{20}O_6$

### Primary mechanism

Anti-inflammatory

### Dose

500 mg

### Daily upper limit

8000 mg

### Hacker doses

150-5000 mg

**Form:** Natural form extracted from *Curcuma longa*

**Product info page:** [Curcumin](#)

### Safety

Curcumin is considered safe for most adults [1].

Curcumin does not cause significant short-term toxicity at doses up to 8 g/day [2].

High doses or long-term use of turmeric may cause indigestion, nausea, or diarrhea [1].

Side-effects at lower doses have been reported in cancer patients who ingested curcumin at doses ranging from 0.9 to 3.6 g/day for 1–4 months, including nausea and diarrhea and an increase in serum alkaline phosphatase and lactate dehydrogenase [3].

Mild side effects, including headache and skin rash, may be occasionally observed at doses ranging from 500 mg/day to 12 g/day [3].

Abdominal pain was reported with doses as high as 8 g/day for 2 weeks [4].

People with gallbladder disease should avoid using turmeric as a dietary supplement, as it may worsen the condition [1].

### Interactions

Can potentially interact with NSAIDs and anticoagulants.

### Synergies

Curcumin's bioavailability is enhanced by piperine [5].

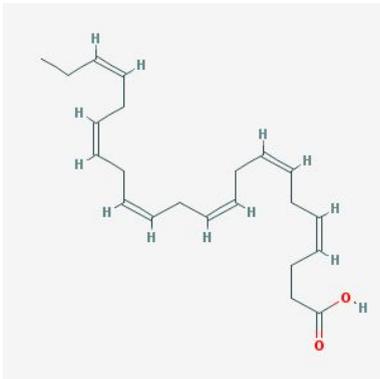
## **Safety Overview**

Curcumin at the recommended dose is considered safe by the US National Center for Complementary and Integrative Health and has shown no side-effects in human studies.

## **References**

- [1] National Institutes of Health, National Center for Complementary and Integrative Health. Office of Dietary Supplements. [Turmeric](#)
- [2] Lao CD et al (2006). Dose escalation of a curcuminoid formulation. BMC Complement Altern Med, 17;6:10. doi: [10.1186/1472-6882-6-10](https://doi.org/10.1186/1472-6882-6-10)
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## Algal DHA



### Scientific name

(4Z,7Z,10Z,13Z,16Z,19Z)-docosa-4,7,10,13,16,19-hexaenoic acid

### Empirical formula

$C_{22}H_{32}O_2$

### Primary mechanism

Cellular metabolism and structure

### Dose

200 mg

### Daily upper limit

5000 mg

### Hacker doses

1,000-3,000 mg

**Form:** Natural form extracted from algae

**Product info page:** [Algal DHA](#)

### Safety

The European Food Safety Authority considers long-term use of supplemental DHA safe at doses up to 5 g/day [1].

Algal DHA has been reported to have an excellent safety profile even at limit intake levels [2].

The no observed adverse effect level (NOAEL) for Algal DHA was considered to be 255 g/day for a 60 kg adult [2].

DHA supplementation studies in adults using doses ranging from less than 1 to 7.5 g/day have not shown any consistent adverse responses in platelet function, lipid levels, in vivo oxidation parameters, glycemic control, or immune function. [3]

### Interactions

May interact with anticoagulant or antiplatelet drugs, antihypertensive drugs, diabetes medication.

### Synergies

Synergistic with uridine in increasing brain levels of phosphatidylcholine [4].

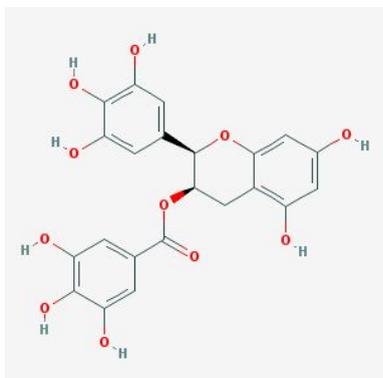
### Safety Overview

Algal DHA has been reported to have an excellent safety profile even at limit intake levels, and its long-term use as a supplement is regarded as safe by the European Food Safety Authority.

## References

- [1] EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA) (2014). Scientific Opinion on the extension of use for DHA and EPA-rich algal oil from Schizochytrium sp. as a Novel Food ingredient. EFSA Journal, 12(10):3843. doi:
- [2] Fedorova-Dahms I, et al (2011). Safety evaluation of DHA-rich Algal Oil from Schizochytrium sp. Food Chem Toxicol, 49(12):3310-8. doi: [10.1016/j.fct.2011.08.024](https://doi.org/10.1016/j.fct.2011.08.024)
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- [4] Wurtman RJ, et al (2006). Synaptic proteins and phospholipids are increased in gerbil brain by administering uridine plus docosahexaenoic acid orally. Brain Res, 1088(1):83-92. doi: [10.1016/j.brainres.2006.03.019](https://doi.org/10.1016/j.brainres.2006.03.019)

## Green Tea Extract: 98% polyphenols, 45% EGCG



### Scientific name

EGCG:  
[(2R,3R)-5,7-dihydroxy-2-(3,4,5-trihydroxyphenyl)-3,4-dihydro-2H-chromen-3-yl] 3,4,5-trihydroxybenzoate

### Empirical formula

EGCG: C<sub>22</sub>H<sub>18</sub>O<sub>11</sub>

### Primary mechanism

Cholinergic

### Dose

500 mg

### Daily upper limit

800 mg EGCG; ~1750 mg extract

### Hacker doses

300-1,000 mg

**Form:** Natural form extracted from *Camellia sinensis*

**Product info page:** [Green Tea Extract: 98% polyphenols, 45% EGCG](#)

### Safety

Green tea is safe for most adults when used in moderate amounts [1].

There have been some case reports of liver problems in people taking concentrated green tea extracts [2].

Green tea extracts contain caffeine. Caffeine can cause insomnia, anxiety, irritability, upset stomach, nausea, diarrhea, or frequent urination in some people [1].

A study in healthy volunteers showed that EGCG administered at 800 mg/day for 4 weeks was safe and well tolerated [3].

### Interactions

Green tea contains small amounts of vitamin K, which can make anticoagulant drugs, such as warfarin, less effective [1].

EGCG can inhibit a secondary mechanism of L-DOPA conversion to dopamine mediated by the enzyme catechol-O-methyltransferase COMT [4]. Although this mechanism yields low levels of dopamine, it may contribute to its overall increase.

### Synergies

In vitro studies suggest that epigallocatechin-3-gallate (EGCG) potentiates the action of huperzine A [5].

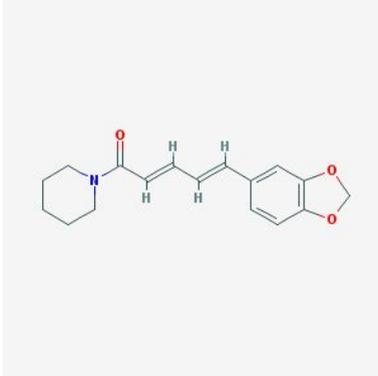
## **Safety Overview**

Although human trials are limited, green tea extract and EGCG at the recommended dose have shown no adverse effects.

## **References**

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## Bioperine (Piperine)



### Scientific name

(2E,4E)-5-(1,3-benzodioxol-5-yl)-1-piperidin-1-ylpent-2,4-dien-1-one

### Empirical formula

C<sub>17</sub>H<sub>19</sub>NO<sub>3</sub>

### Primary mechanism

Anti-inflammatory

### Dose

10 mg

### Daily upper limit

13.3 mg

### Hacker doses

10 mg

**Form:** Bioperine is an extract obtained from black pepper (*Piper nigrum*) containing 95% Piperine.

**Product info page:** [Bioperine](#)

### Safety

Animal studies have established piperine as safe [1]. Piperine in a dose of 20 mg/day administered for 10 days to healthy subjects showed no adverse effects [2].

### Interactions

Piperine has an inhibitory influence on hepatic, pulmonary, and intestinal drug metabolizing system. Piperine thereby increases the bioavailability of therapeutic drugs, increasing their plasma half-life, and delaying their excretion. Although this is a generally beneficial effect, it should be kept in mind [1].

### Synergies

Piperine enhances curcumin's bioavailability [3].

### Safety Overview

Bioperine at the recommended dose is generally recognized as safe (GRAS) by the FDA, with no adverse effects in human trials.

### References

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## Adaptogen Extracts

### Bacopa Monnieri: 45% Bacosides

#### Scientific name

*Bacopa monnieri*

#### Primary mechanism

Cholinergic

#### Dose

300 mg

#### Daily upper limit

1000 mg

#### Hacker doses

200 – 1000 mg

**Form:** *Bacopa monnieri* natural extract

**Product info page:** [Bacopa Monnieri: 55% Bacosides](#)

#### Safety

At a dose of 300 mg/day for 3 months, Bacopa Monnieri has been shown to be generally well tolerated [1].

A trial using single doses of 320 mg or 640 mg of Bacopa Monnieri (55% Bacosides) reported no adverse side-effects [2].

Mild gastrointestinal side-effects have been reported in older adults, including cramping and nausea [3] or stomach upset [4].

#### Interactions

Bacopa Monnieri inhibits acetylcholinesterase and activates choline acetyltransferase, thereby leading to an increase in the levels of acetylcholine [5]. It may thereby interact with cholinergic and anticholinergic drugs.

May also interact with antidepressants, thyroid medication, calcium channel blockers or other sedatives.

#### Synergies

Since it increases the levels of acetylcholine in the brain, its actions are concurrent to those of Centrophenoxine, CDP-choline, Acetyl-L-Carnitine, Huperzine A, Alpha GPC, Forskolin, and Vitamin B5. However, given the low dose of each ingredient, the overall effect falls within safety limits.

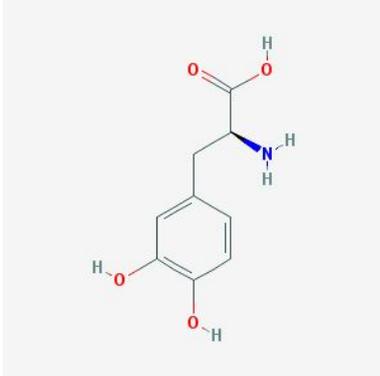
#### Safety Overview

Although human trials are limited, Bacopa monnieri at the recommended dose is safe with only mild occasional side-effects being reported.

## References

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## Mucuna Pruriens: 98% L-Dopa



### Scientific name

*Mucuna pruriens*

L-Dopa: (2S)-2-amino-3-(3,4-dihydroxyphenyl)propanoic acid

### Empirical formula

L-Dopa: C<sub>9</sub>H<sub>11</sub>NO<sub>4</sub>

### Primary mechanism

Dopaminergic

### Dose

100 mg

### Daily upper limit

1000 mg

### Hacker doses

100-1000 mg

**Form:** *Mucuna pruriens* natural extract

**Product info page:** [Mucuna Pruriens: 98% L-Dopa](#)

### Safety

The recommended daily intake of Mucuna Pruriens is less than 1000 mg. 500 mg is the median dose at which most people feel the best effects [1].

A study in which Mucuna Pruriens in a dose containing 500-1000 mg/day of L-Dopa was used for 12-20 weeks noted no significant adverse effects [2].

When used for treating Parkinson's disease, L-DOPA can cause abnormal motor control [3]. In healthy subjects, this side-effects is not evident.

At doses above 1000 mg of L-Dopa, there is a risk of side-effects. These can include: agitation, anxiety, clenching or grinding of teeth, clumsiness or unsteadiness, confusion, difficulty swallowing, dizziness, hallucinations, hand tremor, nausea, vomiting, numbness, unusual and uncontrolled movements of the body, including the face, tongue, arms, hands, head, and upper body, unusual tiredness or weakness [4].

### Interactions

Mucuna Pruriens increases the levels of dopamine through its precursor L-Dopa; it can therefore potentially interact with other drugs that increase the levels of dopamine.

Selective monoamine oxidase type (MAO-B) inhibitors slow the breakdown of dopamine in the brain, meaning more of it stays available.

The enzyme catechol-O-methyltransferase COMT mediate a secondary mechanism of L-DOPA conversion to dopamine. COMT inhibitors can suppress this secondary route of dopamine production, including and EGCG from Green Tea [5].

Using levodopa with any of the following medicines is not recommended: clorgyline, furazolidone, iproniazid, isocarboxazid, linezolid, methylene blue, moclobemide, nialamide, pargyline, phenelzine, procarbazine, toloxatone, tranlycypromine [4].

By increasing the levels of dopamine, Mucuna Pruriens actions are concurrent to those of Tyrosine, Phenylalanine, Phenylethylamine, Hordenine, Phosphatidylserine, CDP-Choline, Rhodiola Rosea, and Vitamin C. However, given the low dose of each ingredient, the overall effect falls within safety limits.

### **Synergies**

ND

### **Safety Overview**

Mucuna Pruriens at the recommended dose delivers levels of L-Dopa that are safe and with no major side-effects.

### **References**

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## Ginkgo Biloba: 24% glycosides, 6% terpene lactones

### Scientific name

*Ginkgo biloba*

### Primary mechanism

Histaminergic

### Dose

50 mg

### Daily upper limit

240 mg

### Hacker doses

30-240 mg

**Form:** *Ginkgo biloba* natural extract

**Product info page:** [Ginkgo Biloba: 24% glycosides, 6% terpene lactones](#)

### Safety

Ginkgo Biloba has been used in clinical trials at doses of to 240 mg/day of extract for durations of up to 6 years with no reported side-effects [1,2].

A trial evaluating the safety and effectiveness of Ginkgo Biloba extract at dosages of 240 mg/day over 22 weeks found no difference in adverse events for ginkgo compared with placebo [3].

Side-effects of ginkgo may include headache, nausea, gastrointestinal upset, diarrhea, dizziness, or allergic skin reactions. More severe allergic reactions have occasionally been reported. [4]

Possibly due to the compound Ginkgolide B, which is an inhibitor of platelet activating factors, Ginkgo biloba has been associated with case studies of subdural hematomas [5]. However, the effect of ginkgo on platelets is unclear: clinical trials have found no effect on platelet function [6]. Still, Ginkgo use should be used with caution by subjects at risk of bleeding, who take anticoagulant drugs, have bleeding disorders, or have scheduled surgery or dental procedures [4].

National Toxicology Program studies showed that rats and mice developed tumors after being given a specific ginkgo extract for up to 2 years. However, these studies used very high doses of Ginkgo biloba (>62,5 mg/kg). Further studies are needed to find out what substances in ginkgo caused the tumors and whether taking ginkgo as a dietary supplement affects the risk of cancer in people [4].

### Interactions

Ginkgo interacts with the human CYP-450 system and its isoenzymes, which may affect the metabolism of various drugs. Case reports of various interactions exist; however, consistent data are limited [7].

There are case reports of bleeding with concomitant administration of ginkgo with antiplatelet or anticoagulant drugs; however, data from large clinical trials suggest such safety concerns are unwarranted [8].

High doses of Ginkgo biloba may slightly decrease benzodiazepine plasma concentrations [9], decrease oral bioavailability of cyclosporine [10], increase the metabolism of omeprazole, reducing its plasma concentrations and decreasing therapeutic effect [11], increase the risk of serotonin syndrome when taken with selective serotonin reuptake inhibitors [12], and increase the risk of sedation with trazodone with concurrent ingestion [13].

## **Synergies**

ND

## **Safety Overview**

Ginkgo biloba has been shown to be safe after long-term use at higher doses.

## **References**

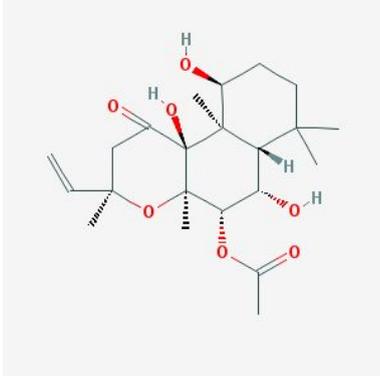
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## Coleus Forskohlii: 20% Forskolin extract



### Scientific name

*Coleus Forskohlii*

Forskolin:

[(3R,4aR,5S,6S,6aS,10S,10aR,10bS)-3-ethenyl-6,10,10b-trihydroxy-3,4a,7,7,10a-pentamethyl-1-oxo-5,6,6a,8,9,10-hexahydro-2H-benzo[f]chromen-5-yl] acetate

### Empirical formula

Forskolin:  $C_{22}H_{34}O_7$

### Primary mechanism

Cholinergic

### Dose

10 mg (2 mg Forskolin)

### Daily upper limit

50 mg

### Hacker doses

6-12 mg

**Form:** *Coleus forskohlii* natural extract.

**Product info page:** [Coleus Forskohlii: 20% Forskolin](#)

### Safety

No adverse effects for forskolin administered orally were reported in trials administering a dose of 10 mg/day for 2 months [1], 10 mg/day for 6 months [2], 30 mg/day for 3 weeks [3], or 250 mg of 10% forskolin extract twice a day for 12 weeks [4].

Individuals with ulcers should be cautious as forskolin can increase stomach acid levels [5].

### Interactions

Inhibits acetylcholinesterase: increases acetylcholine levels [6].

By increasing the levels of acetylcholine, forskolin can potentially interact with cholinergic and anticholinergic drugs.

Individuals bleeding disorders or on blood-thinning medication should also be careful because of forskolin's effect on platelet aggregation [7].

### Synergies

Synergistic with artichoke extract in increasing cAMP levels [8].

Since forskolin increases the levels of acetylcholine in the brain, its actions are concurrent to those of Centrophenoxine, CDP-choline, Alpha GPC, Acetyl-L-Carnitine, Huperzine A, Vitamin B5, and Bacopa Monnieri. However, given the low dose of each ingredient, the overall effect falls within safety limits.

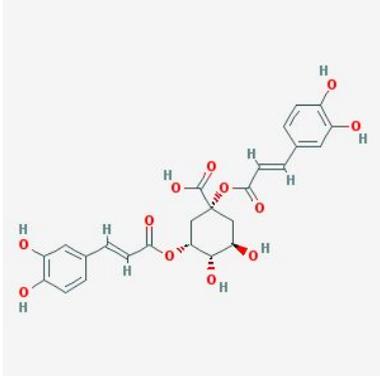
## **Safety Overview**

Coleus forskohlii at the recommended dose has shown no adverse effects in human trials. However, it may be contraindicated for individuals with cardiovascular conditions.

## **References**

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- [2] González-Sánchez R, et al (2006). Forskolin versus sodium cromoglycate for prevention of asthma attacks: a single-blinded clinical trial. *J Int Med Res*, 34(2):200-7. doi: [10.1177/147323000603400210](#)
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## Artichoke Extract: 5% Cynarin



### Scientific name

*Cynara cardunculus*

Cynarin:

(1R,3R,4S,5R)-1,3-bis[[(E)-3-(3,4-dihydroxyphenyl)prop-2-enoyl]oxy]-4,5-dihydroxycyclohexane-1-carboxylic acid

### Empirical formula

Cynarin:  $C_{25}H_{24}O_{12}$

### Primary mechanism

Antioxidant

### Dose

500 mg

### Daily upper limit

1000 mg

### Hacker doses

500-1000 mg

**Form:** *Cynara cardunculus* natural extract

**Product info page:** [Artichoke Extract: 5% Cynarin](#)

### Safety

Artichoke extract has been shown to be well tolerated [1].

In a study on 557 individuals taking an average daily dose of 1500 mg artichoke extract for an average of 43.5 days, 1.3% of patients experienced mild adverse drug reactions such as flatulence, feeling of weakness and hunger [1].

In a 143-patient study, no adverse events were reported from artichoke extract administration in a dose of 1800 mg/day for 6 weeks [2].

Allergic reactions to artichoke extract have been reported [1].

### Interactions

ND

### Synergies

Synergistic with forskolin in increasing cAMP levels [3].

### Safety Overview

Although human trials are limited, Artichoke extract has been shown to be well tolerated, with no adverse effects being observed even at higher doses. Allergic reactions have been described.

## References

- [1] Kraft K (1997). Artichoke leaf extract - Recent findings reflecting effects on lipid metabolism, liver and gastrointestinal tracts. *Phytomedicine*, 4(4):369-78. doi: [10.1016/S0944-7113\(97\)80049-9](https://doi.org/10.1016/S0944-7113(97)80049-9)
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## Rhodiola Rosea: 3% Rosavins, 1% Salidroside

### Scientific name

*Rhodiola rosea*

### Primary mechanism

Dopaminergic

### Dose

300 mg

### Daily upper limit

ND (680 mg/day)

### Hacker doses

100-600 mg

**Form:** *Rhodiola rosea* natural extract

**Product info page:** [Rhodiola Rosea: 3% Rosavins, 1% Salidroside](#)

### Safety

No major risks have been associated with *Rhodiola rosea* [1].

When taken orally, *rhodiola* may eventually cause dizziness, dry mouth, and headaches [2]. Some people may have allergic reactions to *rhodiola* [2].

No adverse effects were reported in human trials of *Rhodiola* extract administered at doses of 576 mg/day for 28 days [3], of 660 mg/day for 20 days [4], and of 680 mg/day for 42 days [5].

### Interactions

*Rhodiola Rosea* inhibits MAO-A and MAO-B [6], thereby increasing the levels of dopamine.

A number of side-effects have been attributed to MAO inhibitors, mainly related to increased levels of dopamine. These include: increased tremor, loss of balance, restlessness, facial grimace, falls, stiff neck, tardive dyskinesia, dystonic symptoms, dyskinesia, involuntary movements, freezing, apraxia, muscle cramps, hallucinations, dizziness, confusion, anxiety, depression, drowsiness, behavior/mood change, sleep disturbance, transient irritability, headache, migraine, pain, tinnitus, dry mouth, blurred vision, cardiovascular alterations, nausea/vomiting, constipation. Most of these effects occur at very high doses of MAO inhibitors.

MAO inhibitors should not be combined with other psychoactive substances (antidepressants, painkillers, stimulants). Drugs with actions on epinephrine, norepinephrine, or dopamine must be administered at low doses due to potentiation and prolonged effect.

## **Synergies**

By increasing the levels of dopamine, Rhodiola Rosea's actions are concurrent to those of Mucuna Pruriens, Tyrosine, Phenylalanine, Phenylethylamine, Hordenine, Phosphatidylserine, CDP-Choline, and Vitamin C. However, given the doses of each ingredient, the overall effect falls within safety limits.

## **Safety Overview**

Rhodiola Rosea has been shown to be well tolerated, with no adverse effects being observed even at higher doses. Allergic reactions have been described.

## **References**

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## Lion's Mane: 30% polysaccharides

### Scientific name

*Hericum erinaceus*

### Primary mechanism

Cellular metabolism

### Dose

500 mg

### Daily upper limit

2000 mg

### Hacker doses

250-1000 mg

**Form:** *Hericum erinaceus* natural extract

**Product info page:** [Lion's Mane: 30% polysaccharides](#)

### Safety

A 2000 mg/day dose of Lion's Mane during 4 weeks did not induce any reported side-effects in humans [1].

A 720 mg/day dose of Lion's Mane during 16 weeks showed no adverse effects in humans [2].

### Interactions

ND

### Synergies

ND

### Safety Overview

Although human trials are very limited, Lion's Mane has been shown to be safe, with no adverse effects being observed even at higher doses.

### References

[1] Nagano M, et al (2010). Reduction of depression and anxiety by 4 weeks *Hericum erinaceus* intake. *Biomed Res*, 31(4):231-7. doi: [10.2220/biomedres.31.231](https://doi.org/10.2220/biomedres.31.231)

[2] Mori K, et al (2010). Improving effects of the mushroom Yamabushitake (*Hericum erinaceus*) on mild cognitive impairment: a double-blind placebo-controlled clinical trial. *Phytother Res*, 23(3):367-72. doi: [10.1002/ptr.2634](https://doi.org/10.1002/ptr.2634)

## Gynostemma (Active-AMP)

### Scientific name

*Gynostemma pentaphyllum*

### Primary mechanism

Antioxidant

### Dose

150 mg

### Daily upper limit

ND 450 mg

### Hacker doses

up to 1500 mg

**Form:** *Gynostemma pentaphyllum* natural extract

**Product info page:** [Gynostemma pentaphyllum extract](#)

### Safety

A Gynostemma extract administered at a dose of 450 mg/day during 12 weeks induced no significant changes in any safety parameter [1].

Oral doses of up to 400 mg Gynostemma Pentaphyllum for 2 months has been shown to be safe in otherwise healthy humans [2].

Oral doses up to 750 mg/kg of Gynostemma extract failed to exert any appreciable toxic effects in rats over a period of 6 months [3]. A rough estimate for the equivalent human dose of 750mg/kg in rats is 120 mg/kg in humans, or 8g daily for a 150lb/~70kg person [4].

### Interactions

ND

### Synergies

ND

### Safety Overview

Although human trials are very limited, ActivAMP Gynostemma at the recommended dose has been shown to be safe, with no adverse effects being observed even at higher doses.

### References

[1] Park SH, et al (2014). Antiobesity effect of Gynostemma pentaphyllum extract (actiponin): a randomized, double-blind, placebo-controlled trial. *Obesity (Silver Spring)*, 22(1):63-71. [doi: 10.1002/oby.20539](https://doi.org/10.1002/oby.20539)

[2] Chavalittumrong P, et al (2007). A phase I trial of Gynostemma pentaphyllum Makino in healthy volunteers. *J. Sci. Technol*, 29(Suppl. 1): [83-93](#).

[3] Attawish A, et al (2004). Chronic toxicity of *Gynostemma pentaphyllum*. *Fitoterapia*. 2004 Sep;75(6):539-51. doi:

[4] Food and Drug Administration (2005). Guidance for Industry Estimating the Maximum Safe Starting Dose in Initial Clinical Trials for Therapeutics in [Adult Healthy Volunteers](#).