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All You Need to Know About BDNF and Natural Ways to Increase It

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What You Need To Know About BDNF

Researchers now recognize that the brain continues to reorganize itself by forming new neural connections throughout life.

Neurotrophins are chemicals that help to stimulate and control neurogenesis, [BDNF](#) being one of the most active ([R](#)).

In the brain, [BDNF](#) is active in the hippocampus, cortex, and forebrain—areas vital to learning, memory, and higher thinking. Hence, [BDNF](#) is important for long-term memory ([R](#)).

It is also expressed in the retina, motor neurons, the kidneys, saliva, and the prostate ([R](#)).

BDNF has been shown to play a role in neuroplasticity, which allows

Most Popular Posts

[The Lectin Avoidance Diet: The Safest Foods for People Sensitive to Everything](#)



[32 Ways to Stimulate Your Vagus Nerve \(and All You Need to Know about It\)](#)

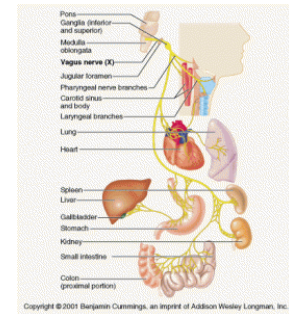
nerve cells in the brain to compensate for the injury, new situations or changes in the environment (R).

BDNF helps to support the survival of existing neurons and encourages the growth, regeneration and creation of new neurons and synapses (R).

BDNF has been shown both to facilitate [glutamate](#) release at the presynapse and to increase postsynaptic [glutamate](#) receptor synthesis (R).

It's important to realize that BDNF levels can be different in different places. So you have blood BDNF levels, CSF BDNF levels and BDNF levels in various brain locations. In healthy people, there's actually no correlation between BDNF in the blood and CSF (R).

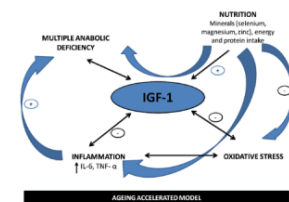
However, a different study says that BDNF in the blood is thought to be a reliable and sensitive marker of its variations occurring in



How to Treat Histamine Intolerance and High Histamine Levels



The Surprising Truth About IGF-1 and How to Increase and Inhibit It



ICES: A Tool to Combat Fatigue and Inflammation (Upgraded

the brain (Lommatzsch et al. 2005) (R).

Since BDNF can cross the brain barrier, it would make sense (R).

Blood BDNF decreases significantly with age (R).

BDNF and Weight



BDNF also can help you lose weight.

BDNF suppresses food intake through hippocampal signaling (R).

BDNF infusion into the rat brain has been shown to lower body weight and to suppress appetite (R).

BDNF increases energy metabolism in obese diabetic animals, partly

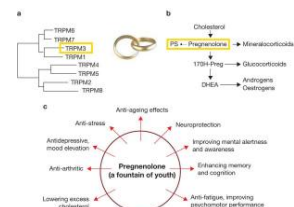
PEMF)



The Benefits of Low Level Laser Therapy (LLLT) and Photobiomodulation



Top 11 Scientific Health Benefits of Pregnenolone (including side effects)



8 Proven Health Benefits of PQQ

through activating the stress response and inducing UCP1 – an uncoupling protein that creates brown fat, which is easily burned for fuel ([R](#)).

In healthy humans, the fatter people are the lower their blood BDNF ([R](#)).

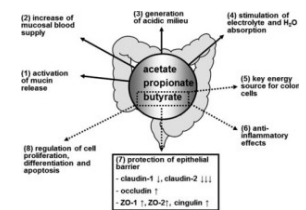
Blood levels of BDNF have been shown to be lower in humans with [obesity](#) and type 2 diabetes ([R](#)). BDNF is also lower in the blood of obese children ([R](#)).

Lower BDNF could be a cause, a side effect of being overweight or related to a factor that decreases both [weight](#) and increases BDNF -sleeping more, eating less, etc...But it definitely seems like more BDNF is causing people to weigh less.

Increasing BDNF can potentially help a number of devastating brain disorders, including Alzheimer's disease, Parkinson's disease, Lou Gehrig's disease, and Huntington's



Top 22 Science-Based Health Benefits Of Butyrate And Its Derivatives



Top 23 Proven Health Benefits of Glycine (with references)



Top 14 Science Based Health Benefits of Lithium (orotate, aspartate, carbonate, chloride)

Disease (HD) (R).

Decreased levels of blood BDNF have been found in underweight women with anorexia (R).

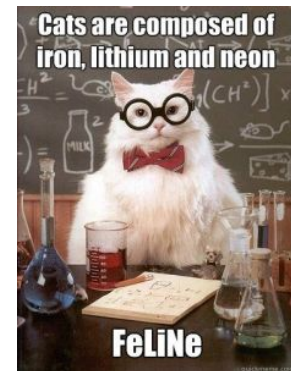
BDNF and Sleep



BDNF in rats is higher after wakefulness than after [sleep](#), and BDNF increases after [sleep](#) deprivation (R).

BDNF triggers slow wave sleep by promoting “synaptic potentiation.” (R).

In mice, the level of exploratory behavior induces BDNF (R)- in humans, this would equate to mental and physical stimulation or novelty. BDNF, in turn, is the signaling molecule that causes an



47 Proven Health Benefits of Zinc That Are Backed by Science (#1 is my favorite)



increase in slow wave sleep (R, R2).

So the more stimulated or sleep-deprived you are, the more you need slow wave sleep, and the molecular link is BDNF.

BDNF and Wellness



When BDNF levels are high, acquiring new knowledge is easier, memories are retained, and people feel happier.

So BDNF can even be thought of as a natural anti-depressant (R), and when levels fall depression can ensue (R).

BDNF levels are decreased in the brains of Huntington's patients, which might be partly responsible



About The Author



At 18, I was functionally illiterate, socially awkward, with a laundry list of health issues

for the degenerative processes of the disorder (R).

Frankenstein mice that are engineered to have hearts without BDNF quickly develop heart failure (R).

Low BDNF could be one of the many possible links between depression and heart disease (R).

BDNF prevents exhaustion of the pancreas in diabetic mice by restoring the level of insulin-secreting granules in beta cells (R).

BDNF also improved insulin resistance in the oral glucose tolerance test in mice (R).

Studies have shown that brain size is correlated with lifespan and BDNF may be that link, since it increases insulin sensitivity (R).

BDNF causes blood pressure to increase, which is perhaps the most significant risk factor for heart disease.

When BDNF is injected in the

including brain fog, OCD and chronic fatigue. My health issues kept getting worse and I had a complete meltdown at 25. Not capable of working, I was financially broke, with almost no help. Both conventional and alternative medicine failed me. So I resolved to take things into my own hands and fix myself. With a mix of ancient wisdom and cutting-edge science, I've completely turned my own life around in every way imaginable - mentally, physically, financially and socially. My mission is to give you the

rostral ventrolateral medulla (mice), blood pressure increases (R).

BDNF overexpression in the paraventricular nucleus (rats) increases blood pressure via angiotensin type-1 receptor-mediated mechanisms (R).

Increased BDNF in forebrain may cause difficulty learning and poor memory formation (R).

Indeed, people who are genetically lower BDNF producers have lower systolic blood pressure (R).

One of the mechanisms by which [salt](#) increases blood pressure is by increasing [vasopressin](#), which is mediated by an increase in BDNF (R).

BDNF and The Circadian Rhythm

information and strategies necessary to selfhack and transform your own life.

[Read More](#)





BDNF has a [circadian rhythm](http://selfhacked.com/2015/09/06/what-it-means-to-keep-to-a-circadian-rhythm/)”
href="http://selfhacked.com
/2015/09/06/what-it-means-
to-keep-to-a-circadian-rhythm
/">circadian rhythm and decreases
as the day goes on ([R](#)).

When light hits your retina, it gets
transmitted to your [hypothalamus](#)
and in the particular
suprachiasmatic nucleus (SCN).

This causes the SCN neurons to
fire, via the neurotransmitter
glutamate.

The SCN is the central [clock](#) and is
the conductor of your [circadian
rhythm](#).

When the SCN fires, that's when the [circadian rhythm](#) starts and you wake up.

BDNF can enhance glutamate neurotransmission in SCN neurons and potentiates glutamate-induced shifts of the circadian rhythm ([R](#)).

BDNF secreted at night is probably required for light-induced shifts in the circadian rhythm ([R](#)).

In mice, BDNF injection during 4PM caused the circadian rhythm to be pushed off by 2.3 hours (so if you wake up at 8AM, you'd wake up at ~10AM)... BDNF treatment during 10PM caused the circadian rhythm to be pushed back 2.3 hours (so if you wake up at 8AM, you'd wake up at ~6AM). No phase shift occurred when BDNF was applied during the day at 7AM.

BDNF-induced circadian shifts were dependent on Glutamate/NMDA receptor stimulation of the SCN ([R](#)).

So it's quite plausible to say that if

you've got low BDNF, it could be harder to set your circadian rhythm.

On the other hand, if you're a high BDNF producer, your SCN may over-fire and burn out more quickly.

If you're getting the [sun](#), that increases BDNF and so you're covered if you get adequate [sun](#).

BDNF, Socializing, and Love



BDNF blood levels were correlated with romantic attachment, but only in women. The higher the BDNF, the lower women scored on an avoidance test (ie, they were more friendly and likely to form

bonds) [\(R\)](#).

So BDNF may play a role in promoting social relationships through a specific decrease of avoidance and fear of the stranger and unfamiliar individuals [\(R\)](#).

Estrogens induce BDNF synthesis in several brain regions [\(R\)](#).

This may be one reason why women score higher on anxiety scales than men [\(R\)](#).

Are You a High or Low BDNF Producer?

If you've got your [23andme](#) or another genetic testing, you can find out if you're a high BDNF producer.

[SelfDecode](#) is the best gene analyzer around and helps you interpret your genetics from [23andme](#) and ancestry.

Here is my version of BDNF SNPs:

1. [RS11030101 \(BDNF\) AT](#)

2. [RS11030104 \(BDNF\) AA](#)
3. [RS12273363 \(BDNF\) TT](#)
4. [RS12273539 \(BDNF\) CC](#)
5. [RS2049046 \(BDNF\) AA](#)
6. [RS56164415 \(BDNF\) GG](#)
7. [RS6265 \(BDNF\) CT](#)
8. [RS7103411 \(BDNF\) TT](#)
9. [RS8192466 \(BDNF\) GG](#)

[See my comprehensive post on the BDNF gene.](#)

Lifestyle to Increase BDNF

If you're a high BDNF producer (more to come) or you have an overactive stress response, you want to select wisely as to which supplements you include.

Sleep

In rats, chronic sleep deprivation led to increased [IL-1b](#) and [TNF](#) and reduced BDNF ([R](#))

People suffering from insomnia had lower BDNF levels compared with sleep-healthy controls. This is one method by which stress decreases BDNF – by ruining sleep. It's

thought that whether stress causes mental disorders depends on if sleep is maintained or disturbed (R).

In anti-depressant therapy, elevated BDNF is a predictor that antidepressants are working.

However, BDNF doesn't actually coincide with a decrease in depression, and for this reason, it's thought that much of predictive effect is based on sleep. This means that BDNF is a marker of how well you're sleeping and good sleep is what's needed for an anti-depressant effect (R).

Getting good sleep is one of the most important things you can do for your health. I rarely use alarm clocks. Don't try to get less of this to accomplish more.

Stress Reduction

Chronic or acute stress and cortisol decrease BDNF in the rat hippocampus (R) and prefrontal cortex (R, R2).

Acute stress more significantly decreases BDNF ([R](#)).

People who are under a lot of stress show less BDNF ([R](#)).

Sun

Sun is something that I've been a proponent of for a long time.

In an analysis of 2,851 individuals in the Netherlands, it was found that blood BDNF increased in the spring and summer and decreased in the fall and winter. BDNF levels correlated to the number of hours a person was exposed to the sunshine ([R](#)).

Supplemental [vitamin D](#) in a human trial does not increase BDNF ([R](#)).

Supplemental [vitamin D](#) in postmenopausal women actually decreases BDNF ([R](#)).

The [VDR](#) doesn't regulate BDNF ([R](#)), so it would make sense that the effects aren't from [vitamin D3](#).

Sun is beneficial by having high energy photons/[Blue light](#), [infrared](#), UVB, and UVA, all four of which have unique and important properties for the body. I'm willing to bet there's more to it, but I just don't know what yet.

Exercise

[Exercise](#) is certainly one of the best ways to boost BDNF levels ([R](#), [R2](#)).

In sedentary male college students, high-intensity [exercise](#) boosted both the BDNF levels and memories ([R](#)).

The changes in BDNF levels were found in nerve cells within days after exercise in both male and female rats and were sustained even several weeks after exercise ([R](#)).

In rats, low intensity is actually better than the high intensity at increasing BDNF ([R](#)).

This accords with evidence in normal rats that show low-intensity

exercise can improve synaptic plasticity better than high-intensity exercise ([R](#)).

This is why I like to take walks as a staple of my exercise regimen. I find it clears the mind.

Cold and Heat ([Sauna](#))

In chicks, cold or heat exposure increased BDNF ([R](#), [R2](#)).

I have an [Infrared Sauna](#) and then take a cold shower. I also expose myself to cold often. I also have many cold devices such as an [Ice Helmet/Cryohelmet](#) and even an [ice vest](#).

Calorie Restriction

Calorie restriction increases BDNF in rodents, but not in humans in this study ([R](#))

Intermittent Fasting

Alternate-day [fasting](#), with a single meal of about 600 calories on a fast day, can boost the production of BDNF by 50 to 400 percent, depending on the brain region ([R](#), [R2](#), [R3](#)).

Cognitive Stimulation

A highly stimulating early social environment in animals increases BDNF ([R](#)).

In mice, the level of exploratory behavior induces BDNF ([R](#))- in humans, this would equate to mental and physical stimulation or novelty.

When you learn things or challenge your brain, the brain increases BDNF because of its important role in memory ([R](#)).

I used to do N-Back many years ago, but I found the best stimulation to be the LSAT.

I don't practice it anymore because I don't have the time and because I

don't need it.

These games could be useful if you aren't getting in a flow state in the day. I don't advocate them if you are getting in the flow.

You know you're in flow if:

- You're consumed with a task
- You're not thinking about the future or the past
- You're not questioning if you like what you're doing
- You're not bored
- You're not stressed

Sleep Deprivation

I previously discussed the importance of getting enough sleep, so this may seem odd. The difference is that this is not chronic sleep deprivation.

Sleep deprivation means staying up all night and this can be used to jumpstart BDNF.

In one study, they use it for this purpose with the anti-depressant Sertraline (Zoloft).

The first single sleep deprivation and a series of three subsequent sleep deprivations accelerated the treatment response that significantly decreased depression and increased BDNF levels ([R](#)).

Steve Jobs used to practice this. I don't like it.

It kills my motivation for a couple of days and worsens my mood when I pull all-nighters.

Keep to a Circadian Rhythm

It's plausible and I'd say likely that when your circadian rhythm is dysregulated, BDNF is decreased.

We see this in people with traumatic brain injuries, who have a dysregulated circadian rhythm and lower BDNF production ([R](#)) – even though you'd expect BDNF to go up to heal the brain injury.

I can't find more studies on this, but I'm willing to wager that

circadian dysregulation will negatively impact BDNF.

Diet/Foods to Increase BDNF

- [Ketogenic Diet](#) (R)
- Stay away from SAD [diet](#) – stay away from a high sugar and high [saturated fat diet](#) i.e. SAD diet...(R)
- [Fish oil/DHA](#) (R, R2),
- [Hi-maize/Resistant starch](#) – converts to [butyrate](#), which causes an increase in BDNF (R)
- [Honey](#): FOS, GOS (Prebiotics)(R)...
- [Blueberries](#) (R),
- [Cocoa](#) (flavanoids) (R),
- [Soy](#) – Both [estradiol](#) and soy phytoestrogens significantly increased BDNF in the frontal cortex of female rats. (R)
- [High salt intake](#) (R)

Liquid Diet -Chew!

A liquid diet in mice actually results in higher BDNF in the hippocampus, but lower levels of another 'downstream' protein that BDNF is supposed to increase.

Think of BDNF as being the first domino, but for some reason later down the line, there's less of another domino. If you're missing a domino at the end, it doesn't matter how much of the first domino you have, because it's the later domino ([TrKB](#)) that controls your genes.

The findings suggest that reduced chewing induced by a liquid diet in early childhood may impair memory and the learning ability, accompanied by a neuronal loss in the hippocampus ([R](#)).

This is why if I have mostly a liquid diet, I make sure to chew [Gum](#).

Hormones/Neurotransmitters to Increase BDNF

- [Progesterone](#) ([R](#))
- [Estrogen](#) ([R](#))
- [Melatonin](#) ([R](#))
- [ACTH](#)
- [Serotonin](#) ([R](#), [R2](#))
- [DHEA](#) ([R](#))

Devices to Increase

BDNF

I use all of the linked devices.

- [PEMF \(R\)](#),
- [LLLT](#),
- [Bright Light Device \(R\)](#),
- [tDCS \(R\)](#)

Supplements to Increase BDNF

- [Butyrate \(R\)](#)
- [Quercetin \(R\)](#) and kaempferol
- [Caffeine \(R\)](#)
- [Curcumin](#) produces neuroprotective effects via activating BDNF/[TrkB](#)-dependent MAPK and PI-3K cascades in rodent cortical neurons ([R](#)).
- [Niacin \(R\)](#)
- [Magnesium \(R\)](#) (in prefrontal cortex, hippocampus)
- [Lactate](#) – Researchers injected people with [lactate](#) and found BDNF levels rose after ([R](#)).
- [Magnesium L-Threonate](#) – Elevation of brain [magnesium](#) increased NMDA receptors (NMDARs) signaling, BDNF expression, the density of presynaptic puncta, and synaptic plasticity in the prefrontal cortex. ([R](#))
- [Inosine \(R\)](#)
- [L plantarum \(R\)](#)
- [Gynostemma \(AMZN\)](#)

- or [Gynostemma](#) (IHERB) ([R](#))
- [EGCG](#) ([R](#))
- [Lithium](#) – Elevates BDNF by inhibition of GSK-3, which also increases skeletal muscle growth ([R](#), [R2](#)).
- [Olive leaf](#) (AMZN) or [Olive Leaf](#) (Paradise) (IHERB) ([R](#))
- [NAC](#) ([R](#))
- [Theanine](#) ([R](#)) -Increases BDNF and attenuates [cortisol](#)-to-[DHEA](#), also has low affinity for AMPA, kainate, and NMDA receptors ([R](#)). (unrelated, but did you know it's a NMDA agonist?)
- [Rhodiola/Salidroside](#) ([R](#))
- [Resveratrol](#) ([R](#))
- [Rehmannia](#) ([R](#))
- [Ginseng](#) (AMZN) or [Ginseng \(Panax\)](#) (IHERB) – When pretreated orally, GRb1 significantly inhibited the stress-mediated decline of BDNF level whereas it further increased the stress-mediated elevation of [HSP70](#) level. ([R](#))
- [Baicalin](#) ([R](#))
- [Bacopa](#) – In rats, [bacopa](#) increased BDNF when the animals were exposed to chronic unpredictable stress. ([R](#))
- [Fo-ti](#)" href="http://www.amazon.com/gp/product/B00B8Z2IYM/ref=as_li_tl?ie=UTF8&camp=1789&

amp;creative=390957&
amp;creativeASIN=B00B8Z2IYM&
amp;linkCode=as2&tag=selfhacked-
20&
linkId=ALSSKJJTHMMDGISX">Fo-ti
(He-Shou-wu) ([R](#))

Other supplements:

- [Beta-alanine](#) ([R](#))
- [Euphoria longan](#) ([R](#))
- [Phytoceramides](#) ([R](#))
- 2-Deoxy-Glucose ([R](#))

Drugs to Increase BDNF

I am not recommending the usage of these, just listing them for informational purposes. Some of them can be beneficial if used in the right way.

- [Semax](#) ([ACTH](#) analogue) ([R](#)),
- Citalopram (Celexa, SSRI) ([R](#))
- [Tianeptine](#) (Tricyclic) ([R](#), [R2](#))
- [LSD](#) ([R](#))
- Ketamine ([R](#))
- Cocaine ([R](#)) – not necessarily good because it increases in the reward regions (mesolimbic pathway), which probably causes addiction...complex...I don't recommend anyone take

cocaine.

- [MDMA \(R\)](#) – increases in some areas, decreases in others...Increases in response to damage...
- Ladostigil (experimental drug) – A reversible acetylcholinesterase and butyrylcholinesterase inhibitor, and an irreversible monoamine oxidase B inhibitor. Enhances expression of GDNF and BDNF [\(R\)](#).
- Rasagiline [\(R\)](#)

Cerebrolysin actually doesn't increase BDNF in mice bred for Alzheimer's [\(R\)](#), but for some reason I thought it did. That's why it's good when I make sure to back up what I say with sources.



Share this:



 More

Comments

KELLY GOODWIN

November 1, 2016 at 11:01 am

Omg this made me cry because I've been dealing with so much nerve and muscle problems. Can you get tested for this?

REPLY

SASCHA

July 29, 2016 at 1:52 am

The reference of caffeine is off. It just links to the wikipedia page.

REPLY

JOSEPH M. COHEN

August 2, 2016 at 7:09 pm

Thanks, I updated it

REPLY

SEAN

June 27, 2016 at 9:01 pm

Jo, have you looked into our digestive biome and other bacteria and parasites that live with us that digest and secrete or are coated in mimicking hormones increasing and

decreasing peoples mental health?
Thanks sean

REPLY

ALEXGIERCZYK

February 25, 2016 at 4:26 pm

Interesting new research:

Brain-derived neurotrophic factor
(BDNF) overexpression in the
forebrain results in learning and
memory impairments.

[https://www.reddit.com/r/Nootropics
/comments/47lram
/brainderived_neurotrophic_factor_bdnf/](https://www.reddit.com/r/Nootropics/comments/47lram/brainderived_neurotrophic_factor_bdnf/)

REPLY

JOSEPH M. COHEN

February 25, 2016 at
5:42 pm

Interesting!

REPLY

KYUNG

December 12, 2015 at 11:20 pm

Oroxylin A, neurogenesis through
increased BDNF

REPLY

LUKE

October 15, 2015 at 3:48 am

I recently tried Tianeptine and I have to say, it is the most mood-stabilizing compound I've ever had in my life. I think I read somewhere that it even normalizes the HPA-axis; it seems/is pretty awesome.

REPLY

K

July 19, 2015 at 7:02 am

The sauna you recommend is not a near infrared, its a Far Infrared, according to this man their is quite a difference. <http://www.drlwilson.com/articles/SAUNAS-NEAR%20VS.%20FAR%20I.htm>

REPLY

PAUL

July 16, 2015 at 1:36 pm

What is the optimal exercise/duration for boosting BDNF?

REPLY

JAMES

July 11, 2015 at 2:40 pm

Why don't you like Semax for neurocognitive improvement? Sounds promising.

REPLY

ARI WHITTEN

July 5, 2015 at 6:49 pm

Hi Joseph,

First of all, thank you for the work you do! Love your blog. And I especially love that you're interviewing people like Pollack and Hamblin. Simply awesome.

Regarding this blog, I want to encourage you to look into psilocybin...

<http://www.ncbi.nlm.nih.gov/pubmed/23727882>

Thanks again for your contributions!
You are doing great work!

- Ari Whitten

REPLY

OSINISA

June 30, 2015 at 11:14 pm

You might want to check out Lion's
Mane mushroom and add it on the list.

REPLY

JOSEPH M. COHEN

July 1, 2015 at 9:32 am

You have a reference?

REPLY

LUIGI

June 29, 2015 at 5:28 pm

sleep has become the most important
activity in my life which can be
difficult when sharing a bed with
someone not so interested, luckily we
have a spare room

REPLY

LORDIOL

June 29, 2015 at 10:18 am

those life stylez are more
comprehensive,
this includes cognitive stimulation
that wasnt apperent before, favored
page.
i am definitely gonna check life style
first.
i am going to buy ices , hope its a
good investment, pliz i do know what
you think about THE ICES.

when you say PEMF? do u cover ices?
or ices and pemf are not the same in
your mind?

could it be that ices gives u some
negative charge>?

REPLY

JOSEPH M. COHEN

June 29, 2015 at 10:28
am

ICES=Upgraded PEMF

REPLY

LUIGI

June 29, 2015
at 5:25 pm

i have the ICES ticking
away under my liver

😊 another great
article Jo TY (will read
properly when more
time)

REPLY

DEANE ALBAN

June 28, 2015 at 11:13 am

I looked at the study on sleep deprivation and it only discussed serum BDNF. Do you know if BDNF in the blood crosses the blood-brain barrier? Not all brain chemicals found in the blood do.

I'm with you on sleep deprivation — don't like it either. And just because Steve Jobs did it is not a recommendation in my book. He may have been a genius but his bad moods were legendary and he died young. Sleep deprivation could not have helped.

REPLY

JOSEPH M. COHEN

June 28, 2015 at 11:49
am

It can cross the BBB

<http://www.ncbi.nlm.nih.gov/pubmed/9886678>

REPLY

DANIEL

June 28, 2015 at 4:10 am

There is now a Phase 3 Trail on megadosing biotin to remyelunate ms brains. Very promissing. Look into that.

REPLY

JOSEPH M. COHEN

June 28, 2015 at 10:12
am

Thx, study?

REPLY

DANIEL

June 28, 2015

at 8:38 pm

[https://clinicaltrials.gov
/ct2/show
/NCT02220933](https://clinicaltrials.gov/ct2/show/NCT02220933)

REPLY

**JOSEPH M.
COHEN**

June 28, 2015

at 9:11 pm

wow, that's
300mg of
biotin.

Supplements
are usually
5mg...

REPLY

LUIZ FERNANDO

June 27, 2015 at 11:49 pm

Excellent reading!

REPLY

SAM

June 27, 2015 at 11:22 pm

It's funny how the major factors in all your posts like these are always the basics i.e. sleep, stress, etc. Just goes to show how important they are and how optimum health is achieved by first taking care of these and then going on to advanced stuff. Thanks for the info Joe!

REPLY

JOSEPH M. COHEN

June 28, 2015 at 10:12
am

Yup

REPLY

Leave a Reply



☐ Email (required) (Address never made public)

Name (required)

Website

-
- ☒ Notify me of new comments via email.
- ☒ Notify me of new posts via email.

