

The kitchen table biohackers guide to ...

Reverse Engineering the Limitless Pill

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“I wasn't high. I wasn't wired. Just clear.”

When Eddie Moira first dropped NZT in the film *Limitless* his life changed, but at what cost? And why was such a simple statement is so seductive to the fans of this film?

NZT doesn't exist, but biohackers do, and they're trying desperately to reproduce this effect.

This report is a brief overview of the state of the art of intelligence enhancement. It's not intended to be exhaustive. Nor is it intended to be followed. Indeed, some of this stuff is potentially quite dangerous.

The first section of this report outlines the hard and safe route to boosting intelligence. There are ways you can make yourself smarter without taking undue risks.

But alas, you want the easy road, don't you?

Just like the fictitious “NZT” real-world “nootropics” (drugs that boost intelligence) have side effects and unintended consequences. One must be fully aware of this fact before attempting any of these methods.

Perhaps there's a larger moral and spiritual lesson to be learned here. Maybe the shortcuts will never work because there are essential lessons to be learned in the enduring of difficulty. I'll leave that question to the philosophers and theologians.

For our purposes, it's enough to face the reality that unintended consequences exist.

You've been warned.

The Foundations - and the Safe Route

“You can not make basic adaptation errors.”

This quote from Dr. Kelly Starrett’s seminal book *Becoming a Supple Leopard*, is as profound a statement about physical fitness as it is about mental fitness.

What he means is that you cannot expect to hot rod your body or mind if you are interfering with the body’s natural pathways of recovery, or if you are not giving it the things it needs to function properly.

People buy his book for sports injury and performance biohacks. They want quick pain relief and quick performance boosts and he delivers them. But he simultaneously brings you down to earth with a healthy dose of reality. The first half of his book teaches you about proper movement and biological maintenance.

Yes, you can abuse your body and he can get you out of an athletic jam faster than perhaps anyone in history, but you would have been able to go so much further had you not been abusing your body to begin with.

The safe route to boosting one’s intelligence begins with the same prescription Dr. Starrett gives to his athletes:

- proper sleep
- stress management
- proper hydration
- healthy nutrition
- healthy movement patterns
- and so on

If you’re using the [High Energy Habit](#) we offer at Simpleology you’ll find his general prescription very much in alignment with our advice as well. Indeed, you’d be hard pressed to find a credible expert in the fields of health and fitness who disagrees.

But alas everyone wants the quick fix without having to put in the “hard yards.” You can choose to go that route, but you will pay the consequences. And you’ll be at a great disadvantage against those who are not making “basic adaption errors.”

Once you clean up your lifestyle in this way, a healthy program of mental stimulation and challenge is a proven route to boosting intelligence.

Constantly expose yourself to new environments and people. Attempt activities that are

progressively more and more challenging. Surround yourself with stimulating, positive thinking, people. Read!

Is this anything new? No. Will you do it? Probably not. Would you be much smarter if you did? Almost certainly. And if you were to combine it with the shortcuts you're about to learn, their effectiveness may be significantly enhanced.

Think of it this way. I was once standing in line to board a flight and there was a rather muscular guy next to me. I struck up a conversation with him and it turns out he worked at a very popular fitness magazine. I asked, "So, what's the best supplement you think I should be taking to pack on the muscle?"

"Diet and exercise!" he barked. No beats missed.

Such is my advice to you.

Nutritional and Pharmaceutical Approaches

Nootropics, or “smart drugs,” are a class of compounds intended to increase human intelligence. A genuine nootropic, if one is to remain true to the definition of the man who coined the term - Dr. Corneliu E. Giurgea, must also be a compound that boosts brain health, rather than harms it.

Many potentially dangerous compounds are often classed among nootropics and opinions about the relative safety of these compounds are as varied as you might imagine.

And to complicate things further, answer me this: what is intelligence? Is it reflected by your IQ? The classic IQ Test is actually a hotly debated topic among psychologists. Many, including me, believe that the old formula MA/BA (mental age / biological age) is a measure of very little practical use fraught with cultural bias.

So, before one could claim a compound increases “intelligence” one would have to agree on a specific measure. Psychologists don't.

Further, it's possible that a compound could increase one “type” of intelligence (for example the ability to distinguish differences in musical notes) and downgrade another (like the ability to perform mathematical calculations).

So, this is a far trickier conversation than those selling miracle smart-pill solutions would have you believe. At the same time, I am a broad supporter of these efforts. Who wouldn't want to overclock the brain? My previous warnings and admonitions aside, I'm an enthusiast.

Just be aware that it's quite the rabbit hole you're about to enter, if you choose to jump in.

Have you spoken to a doctor?

Have you read the previous chapter about the safer route?

If yes, read on.

Neurotransmitter Precursors

Crazy you. You're still here. I suppose I'll have to keep going.

Most (but not all) of these compounds manipulate, in one way or another, neurotransmitters.

Neurotransmitters are chemicals in the brain that transmit signals from one cell to the next. Your brain is this beautiful symphony of connections that fire in enormously complex patterns we do not yet fully understand. And "do not yet fully understand" is an equally enormous understatement.

What we do know is that if the various types of neurotransmitters we need are not available for whatever reason (disease, aging, etc) our brains do not perform at optimal levels.

Some find that by taking precursors for various types of neurotransmitters they can observe an increase in mental performance.

While supplementing with neurotransmitter precursors is one of the safer ways to overclock the brain (it doesn't cause the depletion issues that taking stimulants does, for example - more about that later), it comes with its own set of problems.

Without knowing whether or not your brain is running low on a specific neurotransmitter, taking a precursor can be a bit of a crap shoot. If the bottleneck in your brain performance is a low acetylcholine level, for example, taking a norepinephrine precursor may not have any effect at all.

What to do?

Well, you can experiment with taking individual precursors or combinations thereof, until you get the desired effect. Or you can take ready-made precursor "stacks" that are meant to address general neurotransmitter availability. You'll learn some specifics shortly.

Just be aware that with biohacking comes a great responsibility to monitor oneself. What is working today may not work the next day ... Some compounds have cumulative effects that are undesirable ... Some compounds work for a few days or weeks and then attenuate, requiring you to up the dose ... Pay attention to yourself at all times and thoughtfully make adjustments needed - based on accurate information.

Agonists and Other Overclockers

A completely different approach to altering brain chemistry for your benefit is to stimulate the release of a neurotransmitter, or to “recycle” it. These “agonists” are generally far riskier than precursors. Indeed, many illegal narcotics are neurotransmitter agonists and most are illegal for a good reason. If you disagree, hang out with a few meth addicts for an hour and get back to me. (Yes, perhaps compassionately rehabilitating them is a better approach than turning them into criminals, but you get my point.)

Other compounds that I’d put in the class of general “overclockers” work by different mechanisms - some of which we don’t yet fully understand. Modafinil, for example, is known in the Valley as “the real Limitless pill.” It allows one to function on less sleep (the health effects of which - unknown). Improves focus. Just generally makes one more productive. Coders, subsequently, love it. How does it work? We have a few clues, but we’re still not entirely sure.

Other compounds, however, are relatively well understood.

Some of the classic “nootropic” compounds like the “racetams,” for example, are known to work by stimulating the release of acetylcholine. This is very useful to know as it can help you troubleshoot problems in your overclocking efforts. Many people feel light-headed and “fuzzy” when they take racetams. Others report a surge in clarity followed by a crash. Because we know this happens as a result of depleting acetylcholine, these effects can be ameliorated by increasing the amount of available acetylcholine (generally through precursors).

So, keep all this in mind before you experiment. Start with very small doses and work your way up. And for goodness sake, talk to a doctor, and follow “the safe route” above first.

The Stuff

WARNING: The effects of combining chemicals in the body can be quite dangerous. For example, a relatively safe compound can be made quite dangerous when combined with certain medications. If you're taking SSRIs or MAOIs, for example, combination with smart drugs can be extremely dangerous. So, I'll say it again - if you think all of these caveats and warnings are merely meant to cover the legal-asses of those publishing this report, think again. We're saying this stuff because we don't want you to hurt yourself.

Check with your doctor about dosages and about whether you should be doing any of this crazy stuff at all.

This is not meant to be an exhaustive list of nootropic compounds, but rather a list of what are currently believed to be the most effective.

“Believed by whom!” you may rightfully ask. Well, primarily according to the practitioners of “bro science” who experiment with this stuff and swap stories on the Internet. That said, there are those in the biohacking community who back up their opinions with science better than others.

What you see below is a combination of my own experience, the “general bro science consensus” amongst biohackers online, and actual scientific research. I haven't cited any research here because it's all pretty easy to find. There are far riskier compounds I could have included here but didn't (adderall, for example, is commonly used as a study aid, but I seriously question its safety). That said, one still needs to proceed with great caution.

Further, I haven't included any recommendations for specific dosages either. The intention here being to force you to get out there and do your own research before ingesting any of this stuff.

Some will surely argue with my inclusions and omissions. I welcome a good healthy discussion about that on [the blog post for this guide](#).

Ready-Made Stacks

Alpha Brain

I haven't experimented enough with Alpha Brain enough to have a fully formed opinion, but many biohackers I respect enjoy it.

One questionable instruction is to take it "with a light meal." One of the active ingredients is L-tyrosine which I don't believe is actually effective unless taken on an empty stomach. Individual amino acids, when taking for a specific biological effect like boosting neurotransmitter or hormone levels, tend to be ineffective for this purpose when taken with other amino acids. The idea here being that peptides will be formed which will then be used in the body for purposes other than those intended.

I'll leave you to debate this with the companies that sell it.

Cognitex

This is the general cognitive support stack from the Life Extension Foundation. If I were to recommend one stack to start, this would be it. LEF tends to offer high quality, well-researched, products. They are pricey, but they work.

Mitochondrial Energy Optimizer

This is not intended as a nootropic stack as such, but as a tool for boosting the output of your mitochondria. I have however, found it to be an effective nootropic that stacks well with Cognitex. It's also from LEF.

Neuro-Optimizer

Similar to Alpha Brain and Cognitex. Jarrow is a well-respected manufacturer of nutritional supplements I've found to be quite reliable.

Individual Compounds

Many of the compounds included in the above stacks are worth looking into individually. I've deliberately omitted most of them here to keep this report as dense as possible. A few, however, are worthy special mention.

Acetylcholine Precursors

Acetylcholine is an extremely important neurotransmitter that is often the centerpiece of many nootropic approaches. Since many of the more popular nootropics (see "Racetams" below) are acetylcholine agonists, boosting available acetylcholine can be a necessary adjunct to your nootropic regimen.

And boosting acetylcholine may have utility beyond the recreational. One theory of Alzheimer's, for example, is a general decline of available acetylcholine, and this is why many treatment regimens involve boosting acetylcholine.

Modern acetylcholine precursors are much more effective than those of the past (choline bitartrate, etc). The most worthy of investigation are:

Citicoline
Alpha GPC
CDP Choline

Acetyl-L-Carnitine (ALCAR)

An antioxidant that crosses the brain-blood barrier.

Precursor of acetylcholine that deserves solo mention.

Increases output of the mitochondria.

Caffeine

An underrated nootropic believed by some to have a better safety and health profile than is often recognized. Famous biohacker Dave Asprey recommends coffee (see Bulletproof Coffee) as a general health tonic as well as a nootropic, but cautions that the negative health effects associated with coffee come from the mycotoxins found in improperly prepared (moldy) beans.

Centrophenoxine

Another acetylcholine precursor deserving of solo mention. Once available only as a

prescription drug, it is considered a far more bioavailable and useful form of dimethylaminoethanol (DMAE).

Centrophenoxine is also claimed to remove lipofuscin from the brain so is marketed as a general anti-aging tonic. The research on this is conflicting as some claim it only slows the accumulation of lipofuscin rather than remove it.

Fish Oil

Not a direct nootropic as such, but is one of the best and most trusted supplements available for general brain health, boosting of mood, and lowering of general inflammation.

I've found krill oil to be the most effective form of fish oil supplementation because of its superior bioavailability and better DHA/EPA ratios.

Huperzine A

Huperzine A is an acetylcholinesterase inhibitor. That's right, it has precisely the same biological function as the most potent poison on the planet: curare. The difference is a matter of degree.

Huperzine should be cycled, or only used on occasion, as its effectiveness can wear off over time.

Hydergine

Often referred to as the granddaddy of nootropics, not necessarily because it is superior to other nootropics but because it has been under scrutiny as a nootropic for so long.

Hydergine is derived from the same fungus as LSD: the ergot of rye.

Not only is hydergine used as a nootropic, but also as a neuroprotective agent. In Europe some hospitals administer a dose of hydergine intravenously to prevent brain damage in stroke victims.

MCT Oil

Not generally commonly referred to as a nootropic, but it is one of the most direct routes for boosting available glucose in the brain and can provide a clear cognitive boost for some. Be careful with the dosage as it can cause stomach upset if you're not used to it.

Modafinil

In the U.S. Army we used to call Motrin "vitamin M" because we were constantly injured and

addicted to anti-inflammatory drugs. In Silicon Valley, modafinil is the new Vitamin M. It is in fact very effective at boosting alertness and lowering the need for sleep, but some find it also has a dampening effect on creativity. Further, if you're an athlete like me, or if you're under any type of unusual stress, you need your sleep to recover.

Use with caution, but when compared to adderall, its risk profile appears to be significantly better.

Phosphatidylserine (PS)

Not only is PS an excellent nootropic that can boost available acetylcholine, some believe it also directly lowers cortisol. Cortisol is a stress hormone and when levels are high your immune system is downgraded and your ability to burn fat is compromised.

Picamilon

Another drug that used to be only available by prescription that is now fairly readily available over the counter. It boosts blood flow to the brain.

Racetams

The racetams are by far the most popular nootropics outside of caffeine. Piracetam and aniracetam have been used for years, but far more powerful analogues like noopept and phenylpiracetam are now the rage.

Racetams will very quickly burn up your acetylcholine stores, so they are usually stacked with some kind of acetylcholine precursor.

Sulbutiamine

A synthetic analogue of thiamin that crosses the brain blood barrier more readily than organic thiamin. My initial experience with it was tremendously powerful, but the effects seemed to drop off after a few weeks. I've never since been able to reproduce the initial cognitive boost I experienced at any dosage.

Theanine

Theanine can not only boost cognitive ability, but can also provide a calming effect. If one is looking for a more level (non-wired) cognitive boost, theanine is a great candidate for experimentation. It's often stacked with caffeine.

Tyrosine

A precursor to the neurotransmitters norepinephrine and dopamine. Also used to boost thyroid hormones and speed up the production of melanin for faster tanning.

Common Stacks

Bulletproof Coffee

A wonderful concoction invented by biohacker par-excellence Dave Asprey. I love this stuff. Follow Dave's [recipe](#) precisely otherwise you're not going to get anywhere near the same effects.

Racetams + Acetylcholine Precursors

Precursors boost your available acetylcholine. Racetams burn it up. It is very likely the most popular of all nootropic stacks.

This stack makes me very light headed (as does any racetam by itself), but some people swear by it. Remember, everyone's chemistry is different.

Caffeine + Theanine

Caffeine gives you the stimulation, theanine mellows it out. There's another way to get this combination naturally and in a much milder dose: green tea.

Sources

Many of these compounds can be obtained in bulk form at a greatly reduced price.

Here are a few sources to consider. I have no ties (financial or otherwise) with any of them.

Beyond a Centruy

Bulk Nutrition

Mountain Rose Herbs (*thank you Kris Mainieri for the tip*)

eBay (*that's right - a great source for bulk ... just read the reviews and use caution*)

Mechanical Approaches

If you're averse to ingesting chemicals to boost your brain power (smart you), perhaps you would feel safer directly stimulating the brain.

You shouldn't. Some of this stuff is equally potentially dangerous.

Here are a few of the various approaches. As above I'm omitting many questionable or unproven methods and listing only those that are backed by decent science and/or are commonly reported to be effective by biohackers.

Electrical and Magnetic Stimulation

The world has evolved quite a bit since the days of “electroshock therapy” - more formally known as electroconvulsive therapy (ECT). Despite the understandable general distaste for this method expressed by the general public (cognitive impairment is a real possibility), the medical community in the United States surprisingly still recognizes it. There are even a few [vocal proponents](#) of it.

Let's be clear: I am not recommending ECT.

Far less controversial are the milder approaches to electrical and magnetic stimulation of the brain. While ECT has to be performed in a clinical environment, and the patient needs hours afterward to recover from the general confusion that ensues, the more modern methods can be self-administered with take-home devices. And rather than knock someone out, they can actually enhance alertness, induce a state of general calm, or produce a number of other desirable effects.

Here are a few of the more well-studied approaches.

Transcranial Direct Current Stimulation (tDCS) is alleged to boost brain blood flow and electrical activity in the brain. It basically runs a current directly across your forehead. Sounds crazy, but it's even being tested in the U.S. Air Force to boost performance. You can purchase tDCS devices (here's one targeted to [gamers](#)) or [build one yourself](#).

Cranial Electrotherapy Stimulation (CES) is similar to tDCS but the current is applied to the earlobes. CES devices like the Alpha-Stim are readily available. I've experimented extensively with a combined CES/Light-Sound machine (see below) called the DAVID PAL 36 and have found it to be extremely versatile and effective.

Transcranial Magnetic Stimulation TMS is like tDCS but uses magnetism instead of electrical current.

Biofeedback

Biofeedback is an extremely broad field of endeavor and perhaps the safest of all brain hacking approaches.

These devices simply measure things going on in your body and give you direct feedback about what's happening.

Here are a few examples to begin your exploration ...

Electroencephalograms EEG used to be only available in hospitals, but the cost of home devices are rapidly dropping. These will allow you to view the dominant brainwave frequencies occurring during certain types of behavior or awareness. This is extremely useful because if you can quantify the dominant brainwave patterns of, say, a calm yet alert state, you can then train yourself to enter this state more rapidly in the future.

Journey to the Wild Divine is a biofeedback game that measures galvanic skin resistance and heart rate - two of the primary measures of the polygraph device to detect stress in the untruthful. The game trains you to achieve useful states of awareness.

The **Heart Math** institute offers a unique biofeedback approach that measures a proprietary "coherence" score related to the variability of your heart rate. They don't publish the algorithms for the score and because of this I used to think it was nonsense. However, after experimenting with one of their devices, I was able to observe a clear correlation between high coherence scores and states of relaxation - and low coherence scores and states of anxiety. At \$99 their iOS based device may be the best bang for your biohacking buck around.

Light/Sound Stim

“Light and sound” devices and audio recordings have been available for years.

They use various forms of light and sound to stimulate the brain into various brainwave patterns.

The most basic form of this is “[binaural](#)” auditory stimulation. The claim is that by playing a sound of one frequency in one ear, a sound of another frequency in the other ear, your dominant brainwave patterns will match the difference.

It’s trickier and subtler than that, but that’s the general idea. Why is this useful? Because as mentioned above in the section about biofeedback, certain brainwave patterns correlate very nicely with different states of mind.

While a great many wild and unverified claims about the effects of light/sound stim have been made by rogue players in this field, I am convinced the effects on brainwave patterns at least are very real and reproducible.

I have experimented with light/sound machines for years to great effect. Indeed, I attribute much of my creativity to these experiences. Using them takes patience and dedication, but not nearly as much as would be required through standard meditation to reach similar effects.

To give you an idea how deep this rabbit hole goes ... The Dalai Lama claims to meditate for several hours each morning in order to reach the elusive [gamma wave](#) state. He is also apparently on the hunt for anyone who is able to [help him](#) attain this state faster. (Is that you?)

There are a great many very useful light and sound CDs, audio files, and devices - but the marketplace is also littered with an enormous heap of snake oil, so tread carefully. Look for science to back up the claims made.

To experiment with it on the cheap - as in free - you can check out the [BWGen](#) app for Windows or the open source cross-platform (Windows, Mac, Linux) app [Gnaural](#).

The BWGen site also has a nice primer on the [basic theory](#). *(Cool trivia: BWGen was a fun side project of the original inventor of Adobe Audition. Just goes to show how deep are the biohacking roots in the world of software development ...)*

Sensory Deprivation

Floatation tanks are now all the rage (thank you, Joe Rogan). A floatation tank (or “sensory deprivation tank”) is a pitch black pod filled with epsom salt water in as soundproof as space as possible.

The idea is to give you the experience of floating on a cloud and deprive you of all sensory stimulation. The effect can be extremely relaxing. What’s the benefit? Well, other than the general health benefits of cortisol reduction and deep relaxation (think reduced recovery times), people also claim to experience intense altered states of consciousness on a float. These range from spiritual insight to creative inspiration.

Another common way to experience sensory deprivation is with what are known as “ganzfeld” glasses. You can purchase them, or [just make](#) them [yourself](#).

Further Exploration and a Vision for the Future

Biohacking has been an underground movement for years that is just now starting to break into the mainstream, thanks mainly to Silicon Valley's dominance in popular culture.

As someone who has been part of this fringe movement for decades (both personally and professionally) I find this extremely exciting. More people biohacking means more people with whom to share experiences. And a greater demand means more competition in the marketplace. Better tools. Better prices. Hallelujah.

But my interest in this runs deeper. This is the most exciting time to be alive in history, but it's also the most perilous. Think about it ... If the plans for 3D printing an automatic weapon are downloadable to all on the Internet, what other types of destructive power will be at our fingertips in the next few decades?

Attempting to control this technology would be like attempting to stop the ocean with a spaghetti strainer. The tech genie is out of the bottle, he's dancing a little jig around all who attempt to regulate him, and he won't be going back into the bottle any time soon.

My theory is that the only way for us to survive as a species is to chip away at the root causes of conflict (suffering and lack). This is going to take some extremely intelligent and energetic people working to find newer and better solutions. (Will you be one of them?)

So, what does this have to do with biohacking? Well, if we use technology to make people healthier, smarter, and more energetic, our chances of finding solutions for the root causes of conflict go up considerably.

How many latent geniuses are lying dormant - waiting for the right biohack to unlock their potential? Is someone among your friends and family one of them?

Here's how you can do your part:

1. **Become a biohacking entrepreneur**

So many opportunities abound ...

- Mental Exploration Lounges / Brain Gyms
- Nootropic Mocktail Lounges
- Economical Multi-Use Biofeedback Devices
- (hello tip of the iceberg ...)

And that's only in the field of intelligence enhancement. If you read this guide's companion (Nanotech Super Nutrients), you'll know that there are many opportunities in the fields of general health and nutrition as well.

2. Spread the word

The larger the number of people exposed to these ideas, the greater our chances of success as a species. Maybe someone you tell can solve just one piece of the large puzzle. Or maybe someone they tell can.

It matters.

Hang out at the [original blog post](#) for this report to swap ideas and experiences. I hope to see you there.