I'm 32 and spent $200k on biohacking. Became calmer, thinner, extroverted, healthier & happier.

Other deep-dive articles by Serge:

Serge Faguet
Sep 25, 2017 · 29 min read

How I set and execute 50-year goals.

In my previous articles, I talked a lot about how to use biohacking to become more productive, healthier, and more…

hackernoon.com

How to biohack your intelligence—with everything from sex to modafinil to MDMA

I had some free time over the holidays and wrote this article to showcase, on the basis of a personal story, many…

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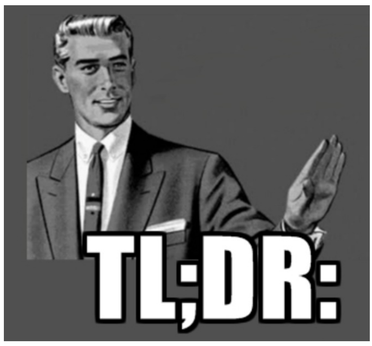
Intro

This post is about how to use modern science and personalized medicine to make yourself healthier, more productive and happier. Every day.

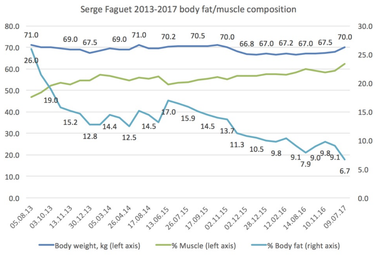


Executive Summary (key points):

- I am a tech CEO who wanted to have better energy, mood, focus, happiness, confidence, willpower, intelligence, health and longevity.
- Over the last 4–5 years, my main hobby has been to get that by hacking my body and mind using a logical, science-based approach.
- As part of that I have optimized my sleep, nutrition and exercise, done thousands of tests, taken dozens of prescription drugs and hundreds of supplements (**part** of the pills I take **every day** below), worked with some amazing doctors, meditated >1000 times, did psychotherapy, took MDMA, and spent ~$200,000 on all this.

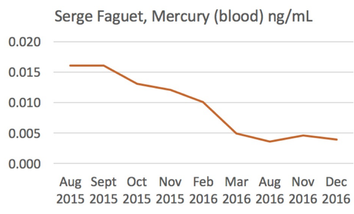
MORNING EVENING

- The results have been awesome. Objectively I dropped body fat 26%=>10% (data below), got my VO2Max to ~70 (very high), improved lots of biomarkers (some examples also below, lots more here: https://medium.com/@sergefaguet/hundreds-of-biomarkers-i-test-in-pursuit-of-focus-health-energy-confidence-and-happiness-dd01572c518b). And subjectively I feel much happier, calmer, energetic, stable, confident, focused. And intelligent, if you think of intelligence as applied ability to solve complex problems.



	Before	After	% diff
LH	3.4	5.4	59%
Testosterone	608	1004	65%
Free-testosterone	8.1	14.7	81%

81% improvement in free testosterone in ~2 months



4x reduction in blood mercury in 1 year

- This blog post is an overview of what I do and why. From it I'll start a bunch of more detailed posts.
- I include a lot of personal health data, test files, what bacteria live in my poop (yes, really). Feel free to share all this. I don't care about my privacy.
- If you are a journalist or someone looking to discuss personalized health in a public way, I am happy to talk. I think this will have a huge impact on society (and especially significantly increase inequality—people like me will be able to enhance our performance, increase our wealth, and invest more and more into enhancing our performance further).

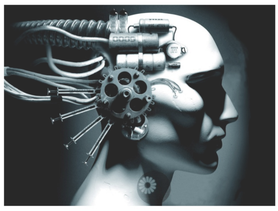
LEGAL DISCLAIMER: IT IS VERY IMPORTANT THAT YOU THINK CAREFULLY, EVALUATE YOUR OWN HEALTH, AND CONSIDER PROFESSIONAL ADVICE BEFORE YOU THINK ABOUT DOING ANY OF THE THINGS I DO. WE ARE ALL VERY DIFFERENT AND WHAT WORKS FOR ME MAY BE DANGEROUS OR USELESS FOR YOU. I AM NOT A DOCTOR. THIS IS NOT MEDICAL ADVICE. THIS IS JUST MY PERSONAL STORY.

Briefly about me:

Serge Faguet, Russian, 32, Cornell undergrad / Stanford MBA-dropout, started some tech companies (TokBox—leading B2B video communication infrastructure company bought by Telefonica; Ostrovok—largest online travel co in Russia, profitable with ~$500m gross turnover in 2017; new stealth-at-this-point AI co in Silicon Valley; been through Ycombinator; worked at Google very briefly).

Before all this I had a lot of challenges with anxieties, insecurities, introversion, weight, focus, anger management, bad moods, procrastination, and other things that many of us struggle with. Now all of them are effectively gone. I mean, I wrote these two huge posts in one weekend and didn't procrastinate for a minute.

Why I do this stuff:



We are (complex) robots.

Robots can be tuned and improved.

It seems obvious that whatever our goals are in life, certain things can help. I (and many others) want to be more energetic, have better willpower, not have bad moods, have the confidence to talk with the cute girl in the line at the supermarket.

All these things depend on transient mental states. And they in turn depend on your biochemistry (amongst other things). If you ever meditated, took drugs, had a bad night of sleep, or been sick you know this to be true: with these biochemical fluctuations your personality changes, and behaviors can become much easier or harder.

My goal is simple: manipulate my biochemistry to get more of the things I want, and less of the things I do not want.

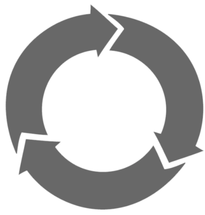
What I want:

Good mood, confidence, focus, energy, willpower, stress resilience, brainpower, calm, health, longevity, removal of social anxieties/inhibitions. All the time. With minimal investment of time and minimal risk.

What I do—overview:

I attack 6 major blocks:

In this post I will give just an overview of things I feel are most important in each area, and then in future posts will dig in at length.



This all goes <u>together</u>.

Important note: all these go together. You cannot sleep well while eating like shit, not exercising, and stressing out. And you cannot exercise/eat well/not stress out if you sleep badly.

FRAMEWORK

In all these areas I use roughly the following framework to decide regarding specific tactics:

- Is it scientifically sound? (i.e. are there studies if such are feasible?)
- Is it logically sound? (i.e. is there a sound explanation behind the tactic?)
- Is the estimated cost (risk, money, time/energy) worth the estimated benefit?
- Do independent smart experts (e.g. doctors) agree with the approach? Do they actually practice the approach themselves and with their families?
- Do I track my objective/subjective metrics related to the tactic, if feasible?

I am actually very conservative and paranoid about these things. For example, I take months to research and talk with people before I decide to take a new compound, start with low doses, and consult with several independent experts. Be careful and don't screw yourself up with this kind of thing.

SLEEP HYGIENE

Objective:

Get plenty of restorative deep and REM sleep on a regular basis.

Key tactics:

- Measure stages. I heard from private individuals that they compared a lot of devices with a proper sleep lab and the best device for measuring appears to be the Oura Ring. https://ouraring.com/ ; an example of measurements they give is below. I'm quite happy with my metrics, it seems I get a lot of deep sleep although my RHR/HRV used to be better, not sure why.

- Block blue light 3–4 hours before sleep. Here is an example of glasses that do that. https://gunnar.com/ (you want the orange-tinted versions)
- Have your bedroom dark (as dark as possible, maybe use an eye mask), cold (18–19 celsius) and humid. Consider Chilipad, very useful. https://www.chilitechnology.com/
- Wake at exactly the same time each morning. This is hard, but easier than going to sleep at the same time (which is just impossible).
- Evaluate things that seem to help or disrupt sleep. You won't be able to do a serious study but you can notice certain trends (e.g. for me even a small amount of alcohol is disruptive; late workouts lead to elevated heart rate etc.)

This book has more info if you'd like to really dig in http://biohackingbook.com/ (you want the free chapter on sleep, I don't like the other ones as much)

Sleep is essential to willpower, which is essential to everything else here.

Keep in mind that things in other sections will help a lot. In a future post I will dig into a lot more detail and describe my personal journey to better sleep.

OPTIMAL NUTRITION

Objective:

Eat good stuff. Don't eat bad stuff. Habituate.

Objective (sciencey version):

minimize insulin levels, maximize glucose disposal, optimize various growth factors (IGF-1, mTOR etc.) towards things we want (e.g. muscle) and away from what we don't want (e.g. cancer).

Key tactics:

All the above are "sugar"
(i.e. high glycemic index, spike insulin)

- Do not eat sugar in any form. Sugar is poison. This means no candy, fruit juices, bread, pasta, honey etc. There are many disagreements about nutrition science. That sugar is extremely bad for you is not one of them.
- Do not eat processed foods. Eat natural food instead.
- Do not eat cheap industrially-farmed animal products.
- Eat mostly plants although I feel going entirely vegetarian for health reasons is not justified.
- Eat organic when possible, especially when discussing animal products. Generally spend more money on food—the cheaper the food, the more "hacks" the producer used to be able to deliver that price. Many of these hacks are harmful—they inject saline solution to increase weight, feed dead animals to live animals, use antibiotics a lot etc.
- In my opinion one shouldn't drink any alcohol (screws up sleep) or add any salt (increases blood pressure) to food.
- I do intermittent fasting where for 3 days a week I eat only once a day. You can search for this online, there appears to be a lot of research that suggests this is a good idea. It is also surprisingly easy after the first couple times.
- I also try to eat ketogenic (high-fat-low-carb) but that is very, very hard to achieve

- I also try to eat ketogenic (high fat low carb) but that is very, very hard to achieve.

Definitely-good stuff

Probably-ok stuff

Nutrition compliance is generally incredibly hard and may take years to develop. Don't try to do this all at once, it is too hard. Just try to make small steps to improve. I still occasionally eat bread or pasta or have a glass of wine.

In a future post, I will describe how I gradually, slowly and very painfully improved in this regard.

OPTIMAL EXERCISE

Objective:

Maximize metabolic benefits (hormones, insulin sensitivity). Minimize time spent and risk of injury.

Key tactics:

- Warmup. I recommend these articles. Fortunate enough to know both Peter and Jesse and they describe it much better than I ever could.
  http://eatingacademy.com/personal/move-defines-live
  http://eatingacademy.com/personal/move-defines-live-part-ii
- Spend majority of your gym time on hip-hinge exercises—deadlift, squat, leg press. The logic is that this activates the largest muscles in your body => much more gain than exercising small muscles (e.g. biceps). Important: hip-hinge exercises should be first practiced with a good personal trainer. They are risky because you can damage your lower back.

- HIIT. Basically if you run, walk and do other constant-speed aerobics you should change to high-intensity intervals. They burn less muscle, spend less time, and deliver greater metabolic results. Look online, there is a lot of info about this.
- Minimize sitting. Get a standing desk or something.

I do the following:

1. 2–3x a week gym with 15 min warmup, 45 min hip-hinge exercise, 30–45 min other muscle groups in order of declining size.
2. 2–3x a week on non-gym days 20-min HIIT run: 5 min warmup, 8 sets of 20–30 sec all-out, 60–90 sec walking, 5 min warmdown. If you do it right, you feel close to sick after this.

I found gym to be one of the easiest routines to set up. Having personal trainers helped a lot. Now it is such an ingrained habit that I don't need them anymore.

MENTAL HEALTH

Objective:

Maximize stress resilience, social support, sense of purpose. Eliminate bad moods.

Key tactics:

- Meditation. It definitely works. This deserves a separate post. But in short, I meditate daily, and found that it has significant benefits. The biggest is that recently

I started to realize that the "self" and "free will" are cognitive illusions, and that makes it very easy to dissipate any negative moods, desires or emotions. I recommend the book Waking Up by Sam Harris here (as long as you are not an easily-offended religious person). https://www.samharris.org/waking-up

- Psychotherapy. Also a separate post. In short, I come to my therapist (who is also a Stanford/Harvard neurobiologist focused on helping high-performance people perform even better) with questions like "how do I enhance my intelligence?" "how do I eliminate bad mood days?" "how do I find it trivially easy to always chat with girls I find attractive?" etc. and we discuss concrete strategies based on research, other high-performer patients he sees etc. If you have not tried psychotherapy you really should, it is awesome.

- Never, ever lie about anything to anyone. Counterintuitive, but this seems to be a huge social hack and people like you a lot more if you always tell everyone the truth, no matter how embarrassing or hurtful. I used to lie a lot and am trying to completely stop. Also recommend the awesome short book "Lying" by Sam Harris which outlines this argument better than I ever could.
https://www.samharris.org/books/lying

- For me, it took awhile to figure out what I want from sex. Eventually I realized there are two major disagreements I have with how society approaches it, and the key to mental health in my case is to say "fuck social norms," and just do what you want (as long as all participants consent and nobody is hurt). Specifically:

1. I want to be public about my sexual habits, fetishes, porn preferences and the like because I believe they are nothing to be embarrassed of.
2. I want to be in relationships with awesome women I find extremely attractive, but at the same time openly (i.e. with everyone's consent and participation) have sex with other women. Constant sexual novelty/excitement, emotional closeness and complete trust/transparency are all non-negotiable for me. Society says one can't have it all in this regard. Personal experience and some knowledge of the intimate lives of other people clearly say otherwise.

I don't talk much about sense of purpose because I never lacked it. I don't know how to help discover that.

Mental health is the most complex of all the things listed here, and is helped by all other sections. So there will be a lot of extra posts on this.

MEDICAL TESTING

Objective:

Discover your bugs and fix them if possible. Everyone has bugs.

Key tactics:

- Blood testing.
- Genetic testing.
- Other (fat %, CIMT, heart tests, CGM, Toxins, microbiome, allergies). Some of these are useful already, some just fascinating but not clear in terms of actionables.

I wrote a very detailed separate post that includes a huge number of tests I have done, how I interpret them etc. Read it here, I promise it is very interesting, and it lists hundreds of metrics I consider. It is here: https://medium.com/@sergefaguet/hundreds-of-biomarkers-i-test-in-pursuit-of-focus-health-energy-confidence-and-happiness-dd01572c518b

Interpretation is hard. This is a new field, the data is very complex, and if you really want to get value out of this, you have to spend a lot of time and effort. It is just the way it is.

Examples of my "bugs"

Also if you look at the testing post, you will see that:

1. I have not screwed myself up despite all this stuff I do. My health seems to be exceptionally good across a large number of tests I have done, and in fact I appear to biologically be significantly younger than 32 if we use biomarkers as proxies for aging (interesting idea, but not enough data yet for rigorous predictions).
2. There is a lot of data out there that can help you understand your risks and how to fix them. It is important to know your metrics.

SUPPLEMENTS & DRUGS

Objective:

Depends on the specific intervention.

Key tactics I use:

- Metfromin. This is an anti-diabetes drug that lowers blood sugar without causing hypoglycemia. It appears to be beneficial in preventing cancer and heart disease and is currently in an FDA-approved trial as the first ever treatment for aging. It is extremely safe. I take 1gr morning / 1gr evening of the extended release version.

- Lithium. I use it as a mood stabilizer + as something that may have beneficial cognitive effects. I take ~100–150mg/day lithium carbonate in the evening. Lower doses are unlikely to have noticeable effects. Higher doses may start having negative effects. Lithium is toxic in high doses so something to be careful about.


SCIENTIFIC AMERICAN

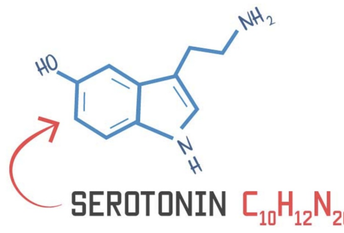
English Cart Bi

A Safe Drug to Boost Brainpower

Rigorous analysis shows the drug modafinil significantly enhances cognition

By Melinda Wenner Moyer on March 1, 2006

- Modafinil. Excellent cognitive enhancer. I take 100–200mg/day. Just read this overview in Scientific American: https://www.scientificamerican.com/article/a-safe-drug-to-boost-brainpower/; I have also taken Adderall for many years and found it to cause a lot of problems (anxiety and over-focus on the wrong things) so stopped.



- SSRI antidepressants. I take 10mg escitalopram daily. It makes everything just a little bit nicer and more enjoyable. That is worth a lot to me.

- Thyroid hormones. I take 25mcg T4 + 20mcg T3. I have below-average thyroid hormones and had a noticeable improvement in mood, energy and cognitive function after I started.
- Growth hormone. I take 0.5 ml of somatropin per day as morning injection. My IGF-1 is naturally very low (115–125) and this boosts it to a below-average 160–180. This is controversial because many people try to lower their IGF-1 in order to enhance cancer resistance. The reason I take it is that I decided I have more to gain by raising it a bit and getting better muscle growth/fat disposal. It also may have some cognitive and neuroprotective benefits.
- Estrogen blockler. I take 50mg clomid 3x per week and cycle it on and off. The reason is that I have below-average-ish testosterone with very low LH/FSH. So that part is clearly a bottleneck, and voila—clomid significantly raises testosterone. I feel more energy and better mood. Also incredibly horny all the time :)
- Phenibut (GABAph). Just started this and don't really have any data, but subjectively it seems to make sleep a bit more restorative and enjoyable. docparsley.com is the supplement I use.

Yes, you are right, i could have come up with a better image for MDMA. H-A is more associated with other drugs.

- MDMA. I will write a whole post about this later. I have only taken it once, and it has

been a truly transformative experience that helped me get rid of a lot of social anxieties and become more extroverted and sexually liberated—all things I really wanted. The effects persist. MDMA is legal in a couple places in the world (e.g. Portugal) plus the FDA is currently running a trial on it for PTSD. It really ought to be legalized.

- **LEGAL DISCLAIMER: DO NOT TAKE DRUGS THAT ARE ILLEGAL IN YOUR HOME COUNTRY. DO NOT DO ANYTHING ILLEGAL.**
- **MEDICAL NOTE: CHECK FOR DRUG INTERACTIONS, ESPECIALLY WITH MDMA. *IN PARTICULAR, MAO INHIBITOR ANTIDEPRESSANTS + MDMA IS LETHAL.***
- Supplements. I take a bunch of other compounds that are non-pharmaceuticals. The general idea is that I try to take things that may be beneficial and are unlikely to be harmful. Many of these are likely useless, I just don't know which ones.

Supplement
Bacopa monieri
Creatine
Olive leaf extract
Trimethylglycine (for homocysteine effects)
Magnesium Threonate
R-Lipoic Acid
Curcumin
Vitamin K2 MK4/7
Ashwagandha
Garlic
Omega-3 (high DHA, mercury-free)
B12 (Methylcobalamin)
Coenzymate-B complex
Vitamin D
CoQ10 (ubiquinol)
Glycine
Elysium basis
Milk Thistle
Probiotics
Prebiotics
Green Tea Extract
Life Extension Mix Capsules
Carnitine
Carnosine
Phospatidylcholine
N-Acetyl-L-Cysteine
Acetyl-Glutathione
Saccharomyces boulardi
Quercetin
Oxaloacetate
BioPQQ

Above are some of the supplements (not including pharmaceuticals) I currently take. A top-notch medical research team I work with went through a large number of studies related to most of these and felt the ones at the top are quite likely useful, the middle probably useful, and no opinion on the ones at the bottom. None of these supplements were thought at all likely to be harmful.

Keep in mind: pharmaceuticals act very differently on different people. Some of these may be useless of harmful for you, even if they benefit me. I have gradually phased these in over years of self-experimentation and deep understanding of how they work.

LEGAL DISCLAIMER: I AM NOT RECOMMENDING YOU TAKE ANY MEDICINE WITHOUT PROFESSIONAL SUPERVISION. PRESCRIPTION DRUGS SHOULD ONLY BE TAKEN BY PRESCRIPTION FROM A REPUTABLE DOCTOR. I AM NOT A DOCTOR.

Closing thoughts:

- This is a long journey. If you want to get value out of this it will take years. The earlier in life you start, the more compound return benefits you will get.
- All this goes together and reinforces each other. For example if you sleep badly, you can't do the other things well. You just won't have the willpower.
- People think of medicine as "healing the sick." But actually because who is sick is subjective, medicine can also upgrade healthy people on key dimensions. Simple example: I use nearly-invisible hearing aids despite having ok hearing. They boost my hearing to levels significantly above the average human. This can help formulate better responses in conversation, be more persuasive because you hear voice tones better, and many other things that give the user social advantages over others.

Viewpoint: Is inequality about to get unimaginably worse?

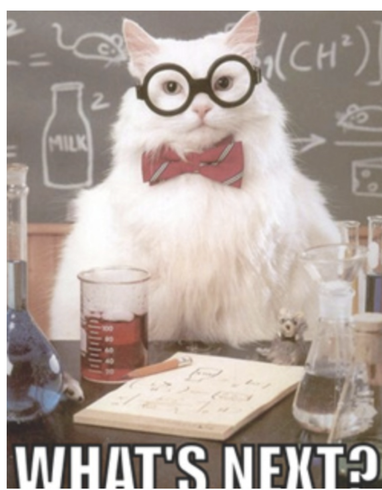
28 April 2017 | World Share

Could advances in technology, genetics and artificial intelligence lead to a world in which economic inequality turns into biological inequality? asks the historian and writer Yuval Noah Harari.

On that note. I think given the way healthcare is organized today, this kind of personalized medicine could significantly increase social inequality beyond where it is now.

People like me will be able to pay for this out of pocket and use off-label prescriptions from private doctors who focus on upgrading and prevention rather than merely healing. Downstream the extra mood, energy, focus, health, willpower and social skills—enhanced over decades—will accrue further and further advantages to people who upgrade themselves, which will lead to a cycle of further concentration of wealth.

I don't have any suggestions on this, just pointing out that this will be a far bigger problem than many other social-justice issues that get attention today.



In future posts, I plan to go in-depth on:

- Detailed journeys in food, sleep, meditation.
- Genetic/genomic testing. Seems so promising, yet right now delivers so little actionable value (personal or commercial).
- In-depth descriptions of a couple of my psychotherapy sessions so that people get a sense of how this awesome tool can be used.
- My MDMA experience, how I think about using it as a therapeutic tool in the future, how I think about safety.
- Detailed thoughts around sex. Trying to figure out how to be extremely public and honest about this without being subject to a lot of trolling, or losing business opportunities.
- Enhancing willpower, which is key to all this.
- Discussion of life extension approaches (or rather aging slowdown approaches). I think there is a very good chance we will be able to significantly extend our lives in the near future.
- Human enhancement. There are many things out there already that significantly increase your competitiveness in society. The biggest one is intelligence amplification, which is already possible and which I for one feel I am successfully doing.

Thanks to everyone who has read this, I hope it has been useful! Also again reminding—read this other post if you did not already https://medium.com/@sergefaguet/hundreds-of-biomarkers-i-test-in-pursuit-of-focus-health-energy-confidence-and-happiness-dd01572c518b

I am also happy to speak at high-quality events/podcasts, talk with journalists about all this—feel free to reach out! Best is to send me a message on Facebook Messenger (https://www.facebook.com/sergef) or Instagram (https://www.instagram.com/sergefaguet/).

EDIT: I noticed that very few people read the post about biomarkers. So decided to include it in full below.

Hundreds of biomarkers I test in pursuit of focus, health, energy, confidence and happiness.

This post is an in-depth review of hundreds of biomarkers I test with real data and commentary—insulin resistance, hormones, ketones, microbiome, toxins, athletic capabilities, bodyfat, mercury, allergies and a lot more. The idea is to illustrate the biomarkers I check and ways I interpret them. I have no sense of privacy at all so feel free to use in whatever way you like.

This is meant to be read together with my main post on biohacking: https://medium.com/@sergefaguet/im-32-and-spent-200k-on-biohacking-became-calmer-thinner-extroverted-healthier-happier-2a2e846ae113

My interpretation at the end of this is that I am extremely healthy, much younger than my chronological age, perform much better than the vast majority of humans on many dimensions, and will live longer/healthier than anyone who has ever lived as of 2017.

Bold claims—partially designed to persuade you to read this long post :) Let's jump into it.

	Laboratory Test	Notes	High Risk	Intermediate Risk	Optimal	High Risk Range	Intermediate Risk Range	Optimal Range	Previous Results 2/17/2017
Lipids	Total Cholesterol (mg/dL)				144	≥ 240	200 - 239	< 200	146
Lipids	LDL-C Direct (mg/dL)				71	≥ 130 CHD & CHD risk eq. > 100	100 - 129 CHD & CHD risk eq. 70 - 100	< 100 CHD & CHD risk eq. < 70	74
Lipids	HDL-C (mg/dL)				66	< 40		≥ 40	63
Lipids	Triglycerides (mg/dL)				55	> 199	150 - 199	< 150	94
Lipids	Non-HDL-C (mg/dL) (calculated)				78	≥ 160	130 - 159	< 130	82
Lipoprotein Particles and Apolipoproteins	Apo B (mg/dL)					≥ 100	81 - 99	≤ 80	71
Lipoprotein Particles and Apolipoproteins	LDL-P (nmol/L)§β, by NMR				904	≥ 1360	1020 - 1359	< 1020	1078
Lipoprotein Particles and Apolipoproteins	Small LDL-P (nmol/L)§β, by NMR				202	> 1000	501 - 1000	< 501	339
Lipoprotein Particles and Apolipoproteins	sdLDL-C (mg/dL)§β				17	> 30	21 - 30	< 21	17
Lipoprotein Particles and Apolipoproteins	Apo A-I (mg/dL)					< 114	114 - 131	> 131	144
Lipoprotein Particles and Apolipoproteins	HDL-P (µmol/L)§β, by NMR				42.9	≤ 34.0	34.1 - 38.0	> 38.0	37.9
Lipoprotein Particles and Apolipoproteins	Apo B:Apo A-I Ratio (calculated)					≥ 0.81	0.61 - 0.80	≤ 0.60	0.49
Lipoprotein Particles and Apolipoproteins	Lp(a)-P (nmol/L)§β					> 125	75 - 125	< 75	183

Cholesterols:

- All except Lp(a) in optimal territory, some significantly better. I should add that this is despite the fact that I eat an extremely high-fat ketogenic diet, so at least for me the idea that cholesterol raises cholesterol is clearly false.
- Particle numbers are more important than milligrams / deciliter.
- Lp(a) is an annoying genetic factor that helps blood clotting and significantly increases cardio risks. It can't be fixed at the moment, but there are drugs on the horizon that target this and that I will take. This is the perfect illustration that we were designed for a different world where wounds were a greater risk than heart disease. And that it is time to take matters into our own hands.

Inflammation/ Oxidation	Fibrinogen (mg/dL)				296	< 126 or > 517	438 - 517	126 - 437	376
Inflammation/ Oxidation	hs-CRP (mg/L)				< 0.3	> 2.9	1.0 – 2.9	< 1.0	0.4
Inflammation/ Oxidation	Lp-PLA$_2$ (ng/mL)§β				117	> 383	291 - 383	< 291	143
Inflammation/ Oxidation	Oxidized LDL (U/mL)§				47	> 70	60 - 70	< 60	45
Endothelial Function	Asymmetric Dimethylarginine (ng/mL)§β					> 108	97 - 108	< 97	83
Endothelial Function	Symmetric Dimethylarginine (ng/mL)§β					> 104	88 - 104	< 88	85
Endothelial Function	L-arginine (ng/mL)§β					< 4500 or > 22500		4500 - 22500	12184
Endothelial Function	Asymmetric Dimethylarginine/Arginine Ratio (calculated)					> 9.8	7.8 - 9.8	< 7.8	6.8

Excellent on inflammation markers—way better than suggested optima, CRP below detection limit. There is a lot of evidence that suggests inflammation is key in all major aging diseases (cancer, heart disease, neurodegenerative disease) so happy to see this. Everyone should know their inflammation markers.

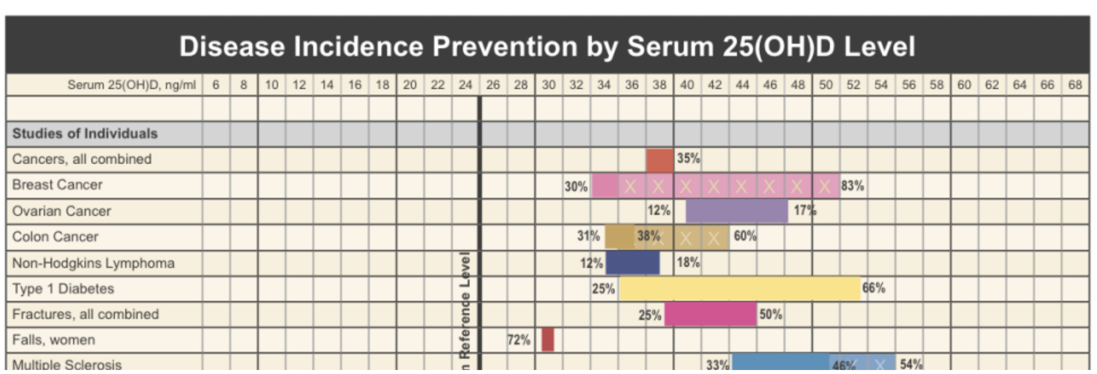
Also great on endothelial function which is key for preventing heart disease.

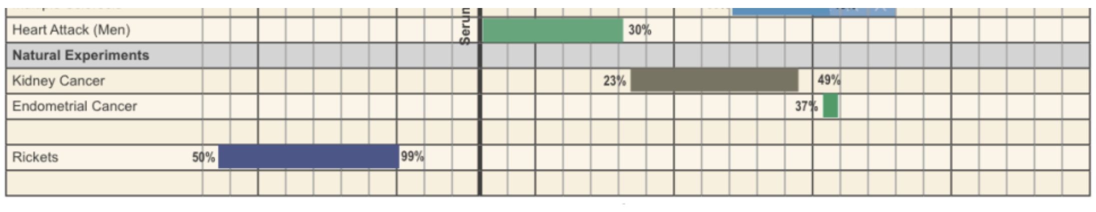
	Laboratory Test	Notes	High Risk	Intermediate Risk	Optimal	High Risk Range	Intermediate Risk Range	Optimal Range	Previous Results 2/17/2017
Myocardial Structure/Stress/Function	Galectin-3 (ng/mL)					> 25.9	17.9 - 25.9	< 17.9	10.9
Myocardial Structure/Stress/Function	NT-proBNP (pg/mL)					> 449	125 - 449	< 125	10
Platelets	AspirinWorks® (urine) (pg/mg of creatinine)					> 1500		≤ 1500	1317
Lipoprotein Genetics	Apolipoprotein E (T471C, C609T)§ rs429358, rs7412					Estimated Genotype Frequency: 2/2 (~1-2%), 2/3 (~15%), 2/4 (~1-2%), 3/3 (~55%), 3/4 (~25%), 4/4 (~1-2%)			3/3
Coagulation Genetics	Factor V Leiden (G1691A)§ rs6025					**Optimal**=Non-carrier (Arg/Arg); **At Risk**=(Arg/Gln or Gln/Gln)			Arg/Arg
Coagulation Genetics	Prothrombin Mutation (G20210A)§ rs1799963					**Optimal**=Non-carrier (G/G); **At Risk**=(G/A or A/A)			G/G
Coagulation Genetics	MTHFR (C677T)§ rs1801133 (Methylenetetrahydrofolate Reductase)					Estimated Genotype Frequency: C/C (~49.3%), C/T (~39.8%), T/T (~10.9%)			C/C
Coagulation Genetics	MTHFR (A1298C)§β rs1801131					Estimated Genotype Frequency: C/C (~7-12%), A/C (~30%), A/A (~58-63%)			C/C
Metabolic	25-hydroxy-Vitamin D (ng/mL)				46	< 20	20 - 29	30 - 100	40
Metabolic	Uric Acid (mg/dL)				5.4	≥ 8.0	7.0 - 7.9	2.0 - 6.9	5.4
Metabolic	TSH (µIU/mL)				2.24	< 0.27 or > 4.20		0.27 - 4.20	2.31
Metabolic	Homocysteine (µmol/L)				8	> 13	11 - 13	< 11	7
Metabolic	Vitamin B_{12} (pg/mL)				1412	< 211	211 - 400	> 400	1320
Metabolic	RBC Folate (ng/mL)					< 700	700 - 750	> 750	> 1558

Here should mention some key genetics things you should be aware of, especially your ApoE (key to Alzheimers risk) and MTHFR (which is what screws up my B12 metabolism).

My TSH is actually not great, the lab is wrong to consider that optimal. Optimal is under 2, so my thyroid is working a bit harder than it should. Wrong lab range is partially because reference ranges are based on sick people.

You should know your Vitamin D and homocysteine. My Vitamin D started at around ~24 and I supplemented it up. My homocysteine started at ~12 and I supplemented it down into optimal territory with a lot of B-vitamins. Both markers have significant associations with key diseases





(credit www.marksdailyapple.com—a great blog about health!)

The screen above shows data compiled from a bunch of studies suggesting that relatively high levels of Vitamin D are protective against a number of diseases. It is very unlikely you will get to these levels without supplementing unless you are a lifeguard on a beach in Israel.

	Laboratory Test	Notes	High Risk	Intermediate Risk	Optimal	High Risk Range	Intermediate Risk Range	Optimal Range	Previous Results 2/17/2017
Metabolic	CoQ10 (µg/mL)§ß			1.75		< 1.11	1.11 - 2.00	> 2.00 Target of therapy for patients on statins is > 2.0 µg/mL.	1.00

TSH is analyzed using reagents from Roche Diagnostics by electrochemiluminescence immunoassay. These values should not be used in conjunction with values from other reagent manufacturers or methodologies.

	Laboratory Test	Notes	High Risk	Intermediate Risk	Optimal	High Risk Range	Intermediate Risk Range	Optimal Range	Previous Results 2/17/2017
Metabolic	Cortisol (µg/dL)				12.2	Morning hours 6-10 a.m.: 5.5-19.8 Afternoon hours 4-8 p.m.: 2.7-10.5 Other or unknown collection time: 2.7-19.8			11.7
Renal	Cystatin C (mg/L)					≥ 1.04	0.96 - 1.03	≤ 0.95	0.68
Renal	Estimated Glomerular Filtration Rate (eGFR, mL/min/1.73m2)					< 60	60 - 89	> 89	> 150
Renal	Microalbumin (urine) (mg albumin/g of creatinine)					≥ 30		≤ 29	3
Renal	Creatinine, serum (mg/dL)				1.0	> 1.2		0.7 - 1.2	1.0

Here the most important thing is that I have exceptional kidney function (eGFR and Cystatin-C)—in the top 5–10% of people in my age group. Especially important for me because all my supplements add workload on kidneys. eGFR is one of the key markers evaluated to calculate people's "true biological age."

	Laboratory Test	Notes	High Risk	Intermediate Risk	Optimal	High Risk Range	Intermediate Risk Range	Optimal Range	Previous Results 2/17/2017
Glycemic Control	Glucose (mg/dL)				83	> 125	100-125	70 - 99	85
Glycemic Control	HbA1c (%)				5.2	≥ 6.5	5.7 - 6.4	≤ 5.6	5.4
Glycemic Control	Estimated Average Glucose (mg/dL) (calculated)				102.5	≥ 139.9	116.9 - 139.8	≤ 116.8	108.3
Glycemic Control	Fructosamine (µmol/L)		347			> 346	302 - 346	< 302	289
Glycemic Control	Glycation Gap				-2.51	> 0.77	0.45 - 0.77	< 0.45	-1.21
Glycemic Control	Postprandial Glucose Index		12.8			> 7.9	6.0 - 7.9	< 6.0	15.2
Insulin Resistance	Leptin (ng/mL)				< 2	> 43	20 - 43	< 20	< 2
Insulin Resistance	Adiponectin (µg/mL)				31	< 10	10 - 14	> 14	33
Insulin Resistance	Free Fatty Acid (mmol/L)				0.47	> 0.70	0.60 - 0.70	< 0.60	0.45
Insulin Resistance	Ferritin (ng/mL) *				25	> 252	147 - 252	< 147	40
Insulin Resistance	α-hydroxybutyrate (µg/mL)§ß		8.6			> 5.7	4.5 - 5.7	< 4.5	7.1
Insulin Resistance	Oleic Acid (µg/mL)§ß				40	> 79	60 - 79	< 60	41
Insulin Resistance	Linoleoyl-GPC (µg/mL)§ß				47.5	< 10.5	10.5 - 13.0	> 13.0	56.4
Insulin Resistance	HOMA-IR (calculated)				1.0	> 4.2	2.6 - 4.2	< 2.6	0.9
Insulin Resistance	CLIX-IR (calculated)				12.8	< 4.3	4.3 - 5.2	> 5.2	
Insulin Resistance	CLIX-Beta Cell (calculated)				18.9	< 4.3	4.3 - 5.2	> 5.2	
Beta Cell Function	Insulin (µU/mL)				5	≥ 12	10 - 11	3 - 9	4
Beta Cell Function	Proinsulin (pmol/L)				4	> 16	8 - 16	< 8	7
Beta Cell Function	C-peptide (ng/mL)				1.1	> 4.6	3.1 - 4.6	1.0 - 3.0	1.4
Beta Cell Function	Proinsulin:C-peptide Ratio				3.4	> 4.9	3.6 - 4.9	< 3.6	4.7
Beta Cell Function	Anti-GAD (IU/mL)				< 5	> 5 Positive		≤ 5 Negative	< 5

		Baseline	1/2 Hour	1 Hour	1 1/2 Hour	2 Hour	Baseline Range	1/2 Hour Range	1 Hour Range	1 1/2 Hour Range	2 Hour Range
Postprandial Evaluation	Glucose (mg/dL)	83		95		46	70 - 99	< 200	< 200	< 160	< 140
Postprandial Evaluation	Insulin (µU/mL)	5		30		5	3 - 9	< 70	< 70	< 60	< 50
Postprandial Evaluation	Free Fatty Acid (mmol/L)	0.47		0.26		0.15	< 0.60	< 0.50	< 0.40	< 0.30	< 0.25
Postprandial Evaluation	C-peptide (ng/mL)	1.1		6.4		3.5	1.0 - 3.0	< 16.0	< 16.0	< 15.0	< 11.0

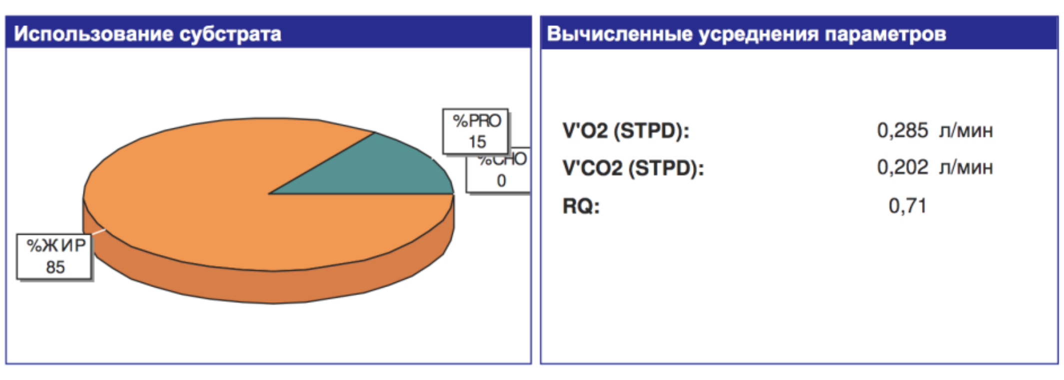
Laboratory Test	Result	Percentile in Reference Population (Insulin Resistance – Insulin Sensitive)	Previous Results
SMALL LDL-P §ß nmol/L	202	high; 75th (1000); 50th (750); 25th (500); low — 202	339

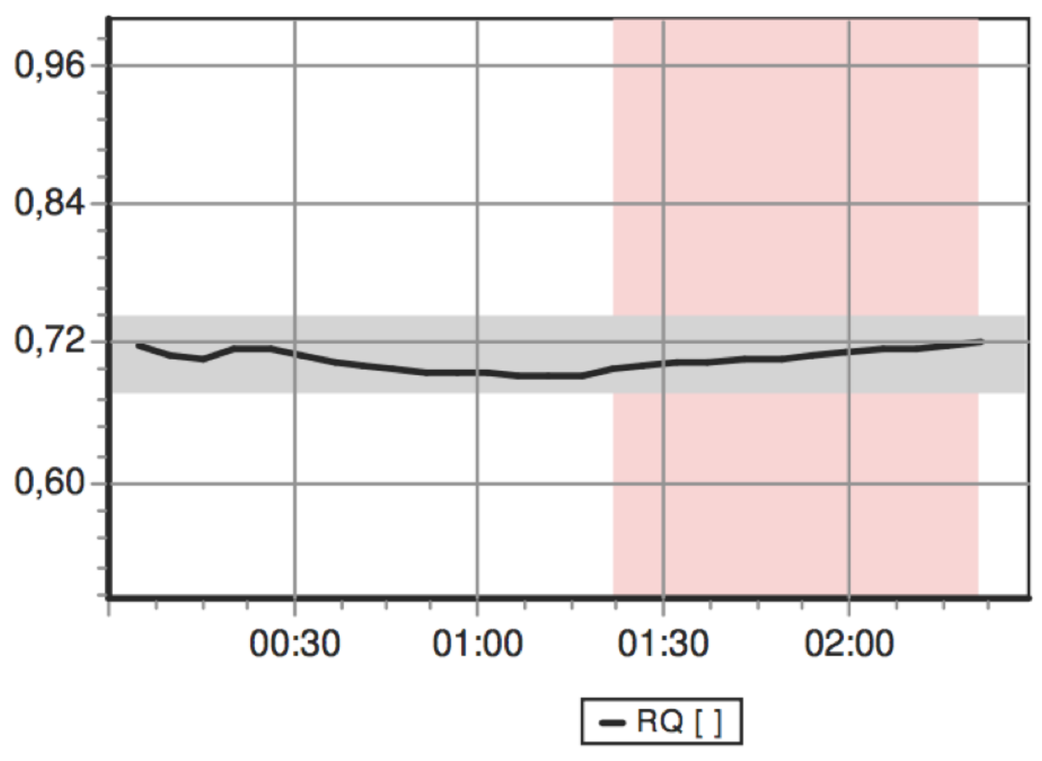
This all mostly has to do with insulin sensitivity which is one of the most key pathways in the body in terms of staving off aging and disease. My baseline glucose, insulin and HbA1c are actually not that great, but they don't matter as much.

What matters the most is the OGTT ("Postprandial Evaluation" in the image above)—a test where you measure markers, then ingest a lot of fast sugar, then measure again couple more times after defined periods. This test shows the dynamics of how efficiently your body gets rid of sugar. In my case, it is extremely good—basically drinking 75mg of a very sugary solution has barely elevated my sugar, and then a small amount of insulin removed a huge amount of glucose out of my blood, taking me down to 46mg/dl. Most people would feel quite hypoglycemic here but I don't because my sugar is constantly low and my body is used to it.

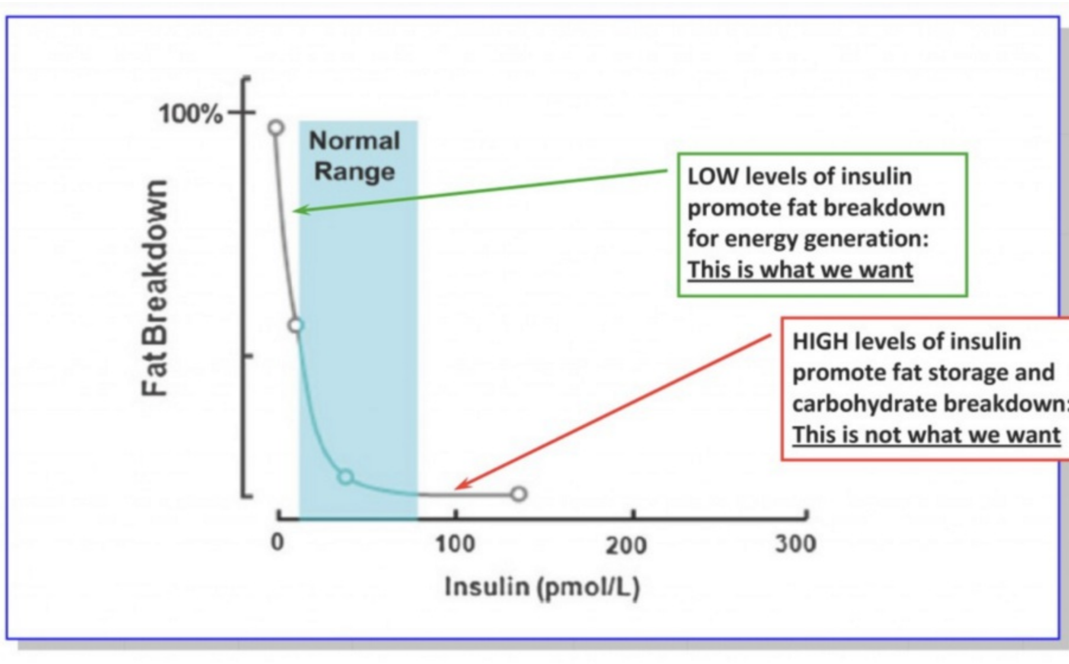
Alpha-hydroxybutyrate is raised because of my ketogenic diet.

Ferritin is fairly low because I eat well and give blood to do all these tests! This is quite key, especially for men. Lower iron is hypothesized to be one of the reasons why women live longer.



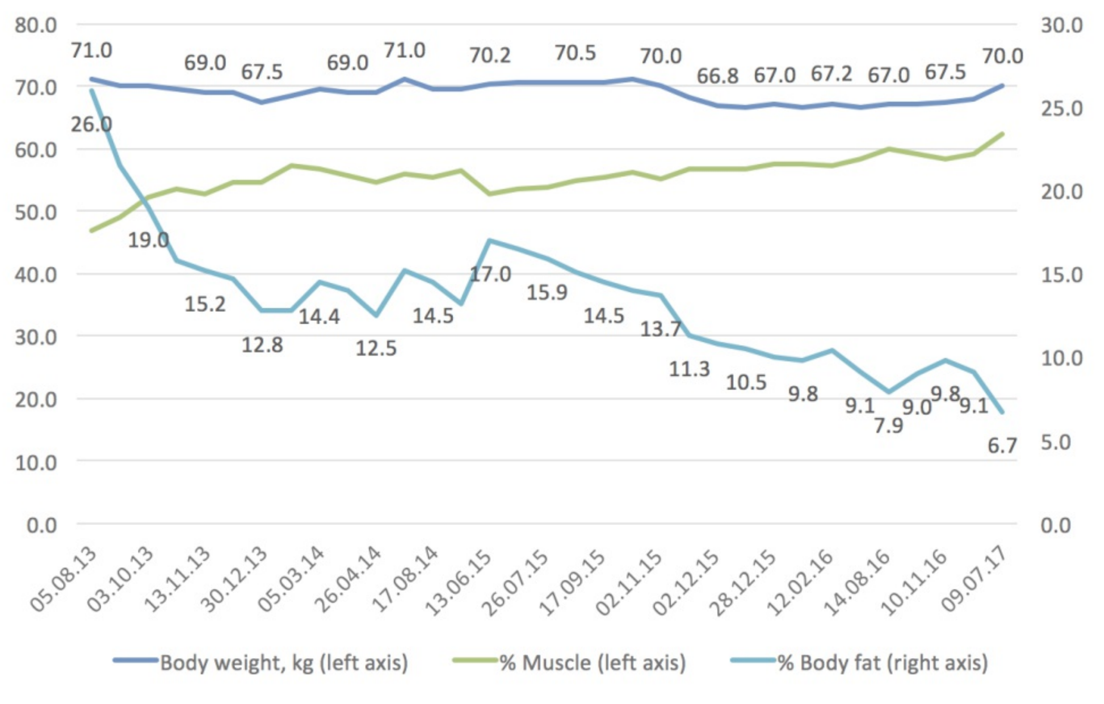


OK, so more on insulin/glucose pathways. Sorry about the Russian in the images. Above is a test called RQ (respiratory quotient) of how much oxygen/co2 you process at rest (you basically put on a gas exchange mask that is also used for VO2max tests below, and sit calmly). What it tells me is that my body runs 85–100% entirely on fat, a little on protein, and not at all on carbs. Which is exactly what you want. I start using the carbs in my body as a dominant energy source only after I get to >150 heartbeats/minute. This enhances athletic performance since glucose storage in the body is limited.



(credit Peter Attia @ http://eatingacademy.com—great blog by one of the most knowledgeable people about preventative medicine in the world, in particular about insulin resistance and ketogenic diets)

If you read up about how cancer cells preferentially eat sugar, how ketogenic diets are more metabolically efficient and generate less waste byproducts per unit of energy etc., you will see that keeping your insulin/glucose pathways extremely optimized is an interesting opportunity for material life and healthspan extension. Not to mention body fat % reduction. This also deserves a whole separate post.



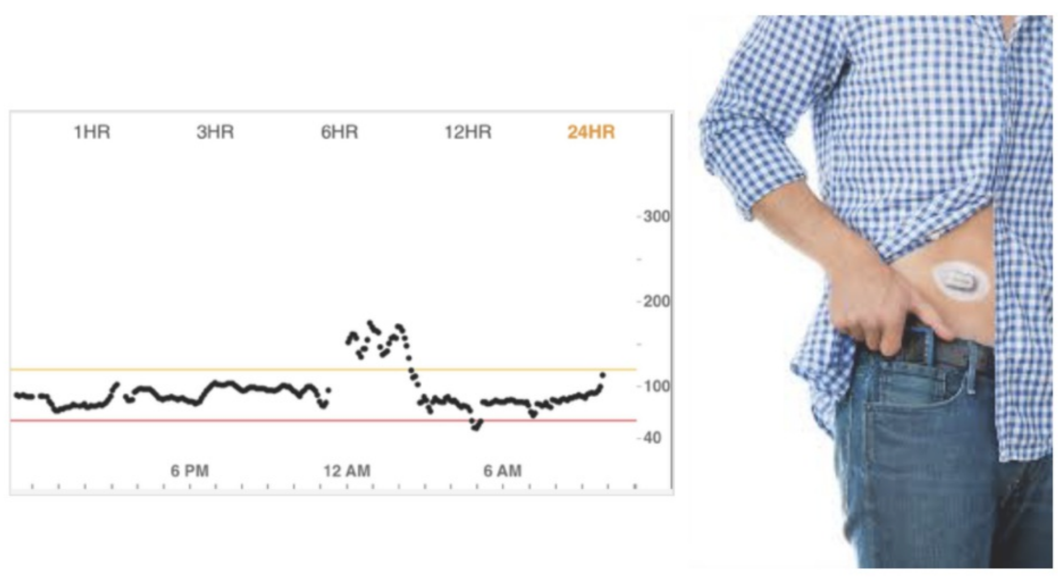
On that note, here is my body fat graph. This was done in 33 separate measurements by the same personal trainer with the same equipment via measuring ~15 different sites for subcutaneous fat with calipers. This is error-prone. DEXA scans are better, but we didn't have easy equipment access on a constant basis.

I think the absolute values are suspect, and bioimpedance suggests I am in the 10–11% range right now rather than ~7%. But the directional trend is very clear and encouraging. Also cool that I actually barely lost any weight, so I added a lot of muscle which has major health benefits (if you want a great detailed book on how muscle

enhances your health, read https://www.amazon.com/Body-Science-Research-Program-Results-ebook/dp/B001NLL38S/).

I don't good have before-and-after pics but I definitely used to be chubby, as all my friends and employees are delighted to keep reminding me :)

Also for those that are interested in ketogenic diets, you measure them via glucometers + ketometers similar to mine above. Be warned that keto blood strips are quite expensive. And that actually getting to a level of ketosis like mine above (after a ~16hr fast) will take a long time and a lot of work.



Also you can use CGM—an implant that tracks your glucose in real-time and sends data to your iphone. This can help figure out which exact foods, activities etc. alter your glucose and are harmful. The above image is from a night a couple years ago when I was stressed, stayed up late, and ate a lot of chocolate while sitting in a bathtub. Note how big the late-night jump is relative to the increase with good food around 6pm. This graph very clearly and unambiguously tells me "hey dude, you are fucking yourself by eating this sugary garbage. Like you just fucked yourself right now—look, let me show you in real-time how you are damaging your health!" Motivational stuff.

CGMs are very cool, but expensive (the Dexcom G5 I used was >$4,000) and a huge hassle. I do think this is the future and plan to use them a lot though. Imagine real-time monitoring of testosterone connected to a pump that keeps it at optimal levels depending on time of day or activity! This is already feasible (albeit not with all molecules), someone just needs to engineer it.

Electrolytes	Result	Flag	Reference Interval
Na+ (mmol/L)	140		133 - 145
K+ (mmol/L)	4.4		3.5 - 5.3
Cl- (mmol/L)	104		98 - 110
CO_2 (mmol/L)	25		19 - 31
Anion Gap (calculated)	11		6 - 18
Calcium (mg/dL)	9.5		8.8 - 10.5

Liver	Result	Flag	Reference Interval
ALT / GPT (U/L)	18		< 42
AST / GOT (U/L)	27		< 41
ALP (U/L)	65		< 16 years: 96 - 410 16 - 20 years: 49 - 210 21 - 90 years: 35 - 117 > 90 years: 38 - 140
Total Bilirubin (mg/dL)	0.4		Up to 1.2

Renal	Result	Flag	Reference Interval
Creatinine, serum (mg/dL)	1.0		0.7 - 1.2
BUN (mg/dL)	15		6 - 20
BUN:Creatinine Ratio (calculated)	15		< 11 years: 14 - 34 11 - 15 years: 10 - 30 16 - 20 years: 9 - 25 21 - 70 years: 10 - 27 > 70 years: 10 - 29
Creatinine, urine (mg/dL)	54		20 - 400

Anemia	Result	Flag	Reference Interval
Iron (µg/dL)	73		59 - 158
Direct TIBC (µg/dL)	461	H	250 - 450
Transferrin Saturation (%) (calculated)	16		15 - 50
Ferritin (ng/mL)	25	L	30 - 400

Others	Result	Flag	Reference Interval
Albumin (g/dL)	4.5		3.7 - 5.1
% Albumin (calculated)	65		54 - 71
Globulin (g/dL) (calculated)	2.4		1.9 - 3.5
Albumin:Globulin Ratio (calculated)	1.89		1.15 - 2.50
Total Protein (g/dL)	6.8		6.1 - 8.0

Thyroid	Result	Flag	Reference Interval
TSH (µIU/mL)	2.24		0.27 - 4.20
T4 (µg/dL)	6.1		4.5 - 11.7
T4, free (ng/dL)	1.13		0.93 - 1.70
T3 (ng/dL)	84		80 - 200
T3, free (pg/mL)	2.4		> 19 yrs - 2.0 – 4.4
Reverse T3 (ng/dL)[50]	13		8 – 24

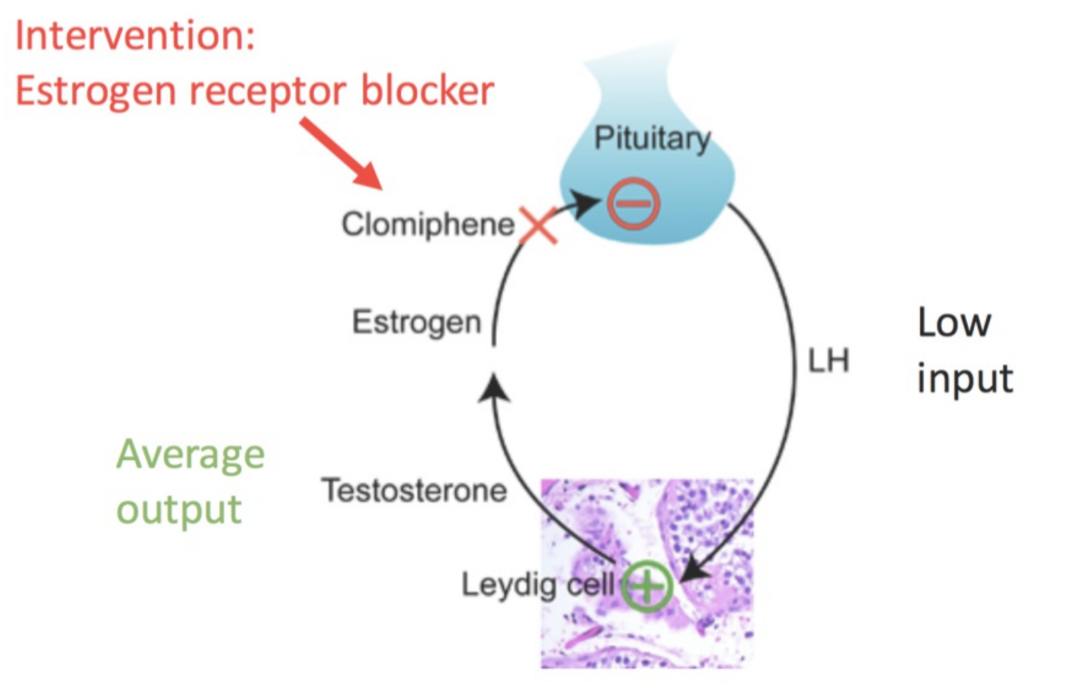
Male and Female Hormones	Result	Flag	Reference Interval
Dehydroepiandrosterone sulfate (µg/dL)	616	H	15 - 19 yrs: 70 - 492 20 - 24 yrs: 211 - 492 25 - 34 yrs: 160 - 449 35 - 44 yrs: 89 - 427 45 - 54 yrs: 44 - 331 55 - 64 yrs: 52 - 295 65 - 74 yrs: 34 - 249 > 74 yrs: 16 - 123
Estradiol (pg/mL)	23.9	L	25.8 - 60.7
FSH (mIU/mL)	4.5		1.5 - 12.4
LH (mIU/mL)	5.4		1.7 - 8.6
Progesterone (ng/mL)	0.27		< 0.48
Human sex hormone-binding globulin (nmol/L)	68		10 - 80
Testosterone (ng/dL)	1004		< 1 year 12 - 21 1 - 6 years 12 - 32 7 - 12 years 12 - 68 13 - 17 years 28 - 1110 > 17 years 348 - 1197

Male and Female Hormones	Result	Flag	Reference Interval
Free Testosterone (ng/dL) (calculated)	14.65		4.7 - 24.4
Dihydrotestosterone (ng/dL)[53]	53		Adults: 30 - 85 Prepubertal: < 3 Tanner Stage / Age 1 < 9.8 < 3 2 9.8 - 14.5 yrs: 3 - 17 3 10.7 - 15.4 yrs: 8 - 33 4 11.8 - 16.2 yrs: 22 - 52 5 12.8 - 17.3 yrs: 24 - 65
Insulin-like Growth Factor 1 (ng/mL)	181		14 - 15 Years 114 - 499 16 - 17 Years 116 - 476 18 - 19 Years 117 - 455 20 - 25 Years 118 - 415 26 - 30 Years 116 - 372 31 - 35 Years 110 - 337 36 - 40 Years 102 - 308 41 - 45 Years 93 - 284 46 - 50 Years 82 - 264 51 - 55 Years 72 - 248 56 - 60 Years 64 - 235 61 - 65 Years 57 - 224 66 - 70 Years 52 - 215 71 - 75 Years 47 - 208 76 - 80 Years 44 - 205 81 - 85 Years 42 - 204 86 - 90 Years 40 - 207

OK, back to more blood testing! Some notes:

- My liver markers are great, which is also important in my case because of all the load my supplements and meds put on the liver. People often ask me how I know all these pills don't screw up my liver. This is how I know.
- Hormones deserve an entire separate post. Mine are not great, the hypothesis is that this is due to a childhood head trauma interfering with the pituitary's function. For example my brother has very similar Lp(a), homocysteine etc problems, but he is much taller than me, which suggests childhood environmentally-driven growth hormone disruption.

As I mention in my main framework post, I boost thyroid hormones, IGF-1 and testosterone.



I had avg testosterone and low precursors. Opportunity!

	Before	After	% diff
LH	3.4	5.4	59%
Testosterone	608	1004	65%
Free-testosterone	8.1	14.7	81%

Testosterone deserves a special mention. In short, I have average-ish testosterone but low LH/FSH (which serve as inputs to testosterone). What controls FSH/LH is binding of estrogen at the pituitary gland. And because estrogen is a testosterone downstream product, there is a feedback loop.

So what I did is take an "estrogen blocker" which competitively occupies the same sites estrogen occupies at the pituitary, without inhibiting FSH/LH. The result can clearly be seen above—in a very short period of time (2 months), free testosterone jumped a lot. This has a noticeable effect on mood and energy. Also very noticeable effect on wanting to have sex all the time:)

CBC with Automated Differential / Platelet	Result	Flag	Reference Interval
WBC ($x10^3$/µL)	5.2		4.0 - 10.5
RBC ($x10^6$/µL)	4.4		4.1 - 5.6
Hemoglobin (g/dL)	13.7		12.5 - 17.0
Hematocrit (%)	41		36 - 50
MCV (fL)	94		80 - 98
MCH (pg)	32		27 - 34
MCHC (g/dL)	34		32 - 36
RDW (%)	12.8		11.7 - 15

RDW (%)	12.8		11.7 - 15
Platelets (x10^3/µL)	285		140 - 415
Neutrophils (%)	42		40 - 74
Lymphocytes (%)	42		14 - 46
Monocytes (%)	8		4 - 13
Eosinophils (%)	7		0 - 7
Basophils (%)	1		0 - 3
Neutrophils (absolute) (x10^3/µL)	2.2		1.8 - 7.8
Lymphocytes (absolute) (x10^3/µL)	2.2		0.7 - 4.5
Monocytes (absolute) (x10^3/µL)	0.4		0.1 - 1.0
Eosinophils (absolute) (x10^3/µL)	0.4		0.0 - 0.4
Basophils (absolute) (x10^3/µL)	0.1		0.0 - 0.2
Immature Granulocytes (absolute) (x10^3/µL)	0.0		0.0 - 0.1

This is a basic blood panel. Nothing too interesting, you basically just do these to make sure nothing is screwed up.

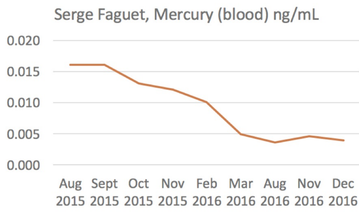
Laboratory Test	Notes	High Risk	Intermediate Risk	Optimal	High Risk Range	Intermediate Risk Range	Optimal Range	Previous Results 01/2021
Inside	HS-Omega-3 Index® (RBC EPA+DHA)[4]			11.1	< 4.0%	4.0% - 8.0%	> 8.0%	11.4

Omega-3 Fatty Acids			
Fatty Acids	Range	Current	Previous
Omega-3 Total[4]	0.1% - 14.1%	**15.2%**	15.7%
Alpha-Linolenic (ALA)[4]	0.1% - 0.4%	0.1%	0.1%
Docosapentaenoic (DPA)[4]	0.6% - 4.1%	4.0%	4.1%
Eicosapentaenoic (EPA)[4]	0.1% - 2.5%	3.3%	4.1%
Docosahexaenoic (DHA)[4]	0.1% - 8.4%	7.8%	7.3%

Omega-6 Fatty Acids			
Fatty Acids	Range	Current	Previous
Omega-6 Total[4]	28.6% - 44.5%	**26.3%**	25.4%
Arachidonic (AA)[4]	10.5% - 23.3%	10.7%	10.1%
Linoleic (LA)[4]	4.6% - 21.3%	12.4%	12.3%

Other Fatty Acids			
Fatty Acids	Range	Current	Previous
cis-Monounsaturated Total	11.5% - 20.5%	**18.2%**	19.3%
Saturated Total	36.6% - 42.0%	**39.5%**	39.0%
Trans Total	<0.1% - 1.8%	**0.8%**	0.6%

I have high EPA/DHA and Omega 3s in general + low Omega 6 and trans fats. Result of great diet + supplementation. This is basically what you want too.

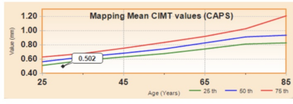


OK, so in the graph above you can see I had elevated mercury and got rid of it. The hypothesis is that it is due to a dental amalgam. I fixed it by stopping eating any large predatory fish + enhancing liver detox capabilities via B-vitamins and the like.

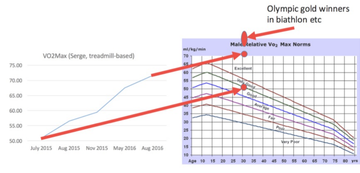
Mercury is likely to interfere with a lot of neurobiological processes and contribute to many issues such as mood disorders. Good riddance.

Arterial Thickness

Grade	Name	Result	Units	Normal Range	Optimal Range
A	Right Distal CCA Mean CIMT	0.517	mm	0.400 - 0.800	0.4 - 0.6
A	Right Distal CCA Mean %	< 25.0	%	25 - 75	< 25
A	Left Distal CCA Mean %	< 25.0	%	25 - 75	< 25
A	Left Distal CCA Mean CIMT	0.502	mm	0.400 - 0.800	0.4 - 0.6



This is a CIMT test. It basically shows the thickness of your neck arteries, which appears to be very predictive of cardio risks a long time in advance. Another factor that suggests that my lifestyle approach is working. The cool thing is that this compares you with people in your own age demographic, so I know that unless something changes, I should have low cardio risk even when I am 85. Cool test, non-invasive, highly recommended.



HIIT Effect on my VO2Max

VO2Max is a measure of how your body performs in terms of gas exchange, and as such evaluates the capabilities of your cardiovascular and pulmonary systems. You measure it by exercising while wearing respiratory gas analysis equipment as in the photo of me above. As the quotes from New York Times above highlight, it appears to significantly predict lifespan and "fitness age."

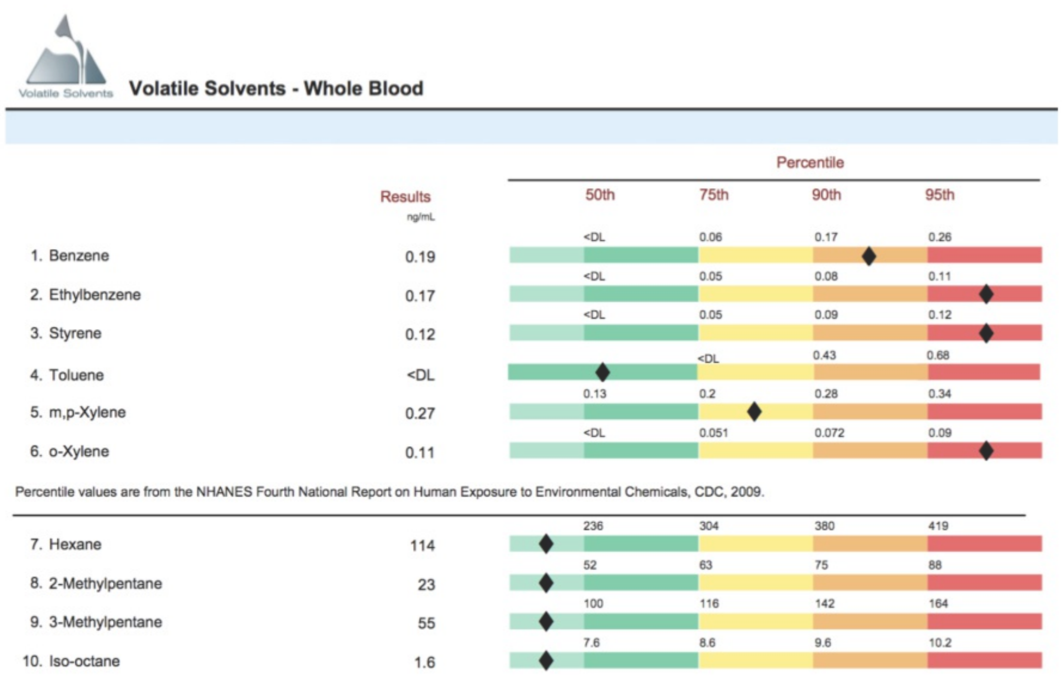
My VO2Max has risen a lot over time and is very high, not far from Olympic medalist levels although I have just about zero athletic accomplishments. I mostly credit high-intensity interval training and weights training, but I don't really know. More recently in a period when I stopped doing HIIT, I saw this metric worsen. Another good indicator that I'm doing something right though.

The above is from a test called "GI Effects" by Genova Diagnostics. It tests your poop (which is very fun to mail) for bacteria, parasites, metabolites and a lot of other interesting things.

I think this is a very fascinating test, but I have no idea how to really use it yet beyond "do not take antibiotics, do take probiotics & prebiotics". Microbiome is a super exciting new frontier of health, but we don't know whether certain microbes cause health states or simply correlate with them. If you want to learn more, take this great class on Coursera which I did and learned a lot from https://www.coursera.org/learn/microbiome

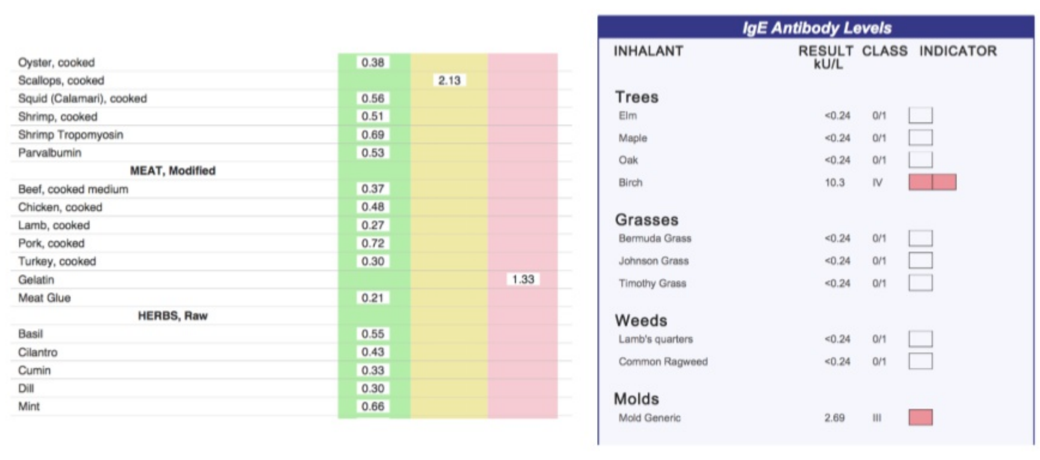
https://drive.google.com/file/d/0BzeKcwaaUlObZlhEWFotenk4d0U/view?usp=sharing

Anyway, my latest entire test is linked to above. Now the entire internet knows exactly what bacterial strains live in my poop as of 2017. Enjoy :)



This is an interesting test (Genova Diagnostic Toxic Effects) that suggests somewhere I was getting significant exposure to VOCs (which are definitely bad for you). The actions I took were to enhance office/home ventilation, not eat/drink from plastic containers, not stand next to people who smoke.

On that last note, one time I took this test after smoking some pure-weed joints (which I do very rarely), and the toxins went off the charts high. If you can't stop smoking, at least vape. Inhaling burned weed or tobacco is incredibly bad for you, I was shocked by the levels of toxic chemicals I saw in myself after just one evening of several joints.



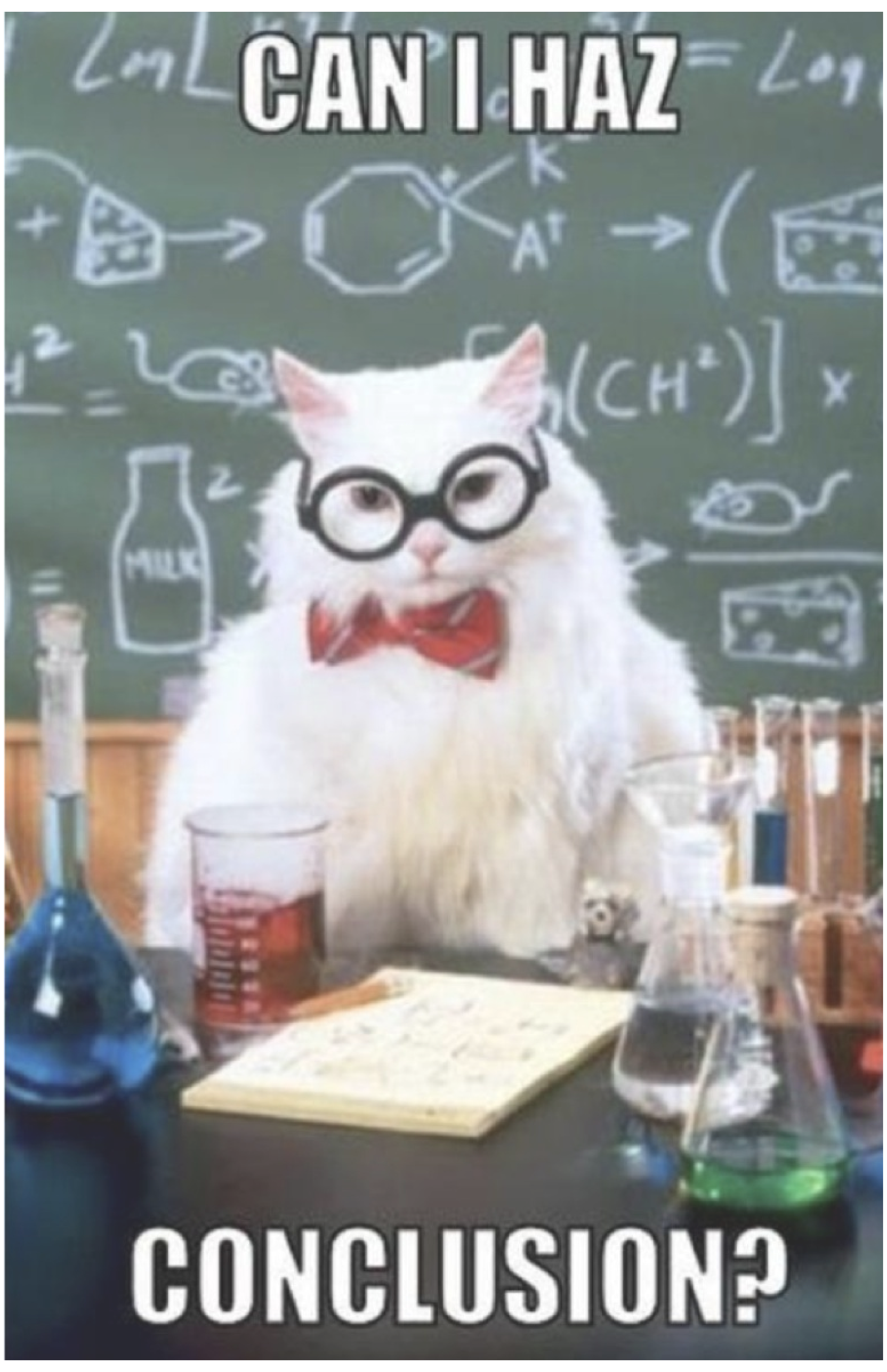
This is from two tests of allergies/sensitivities by Cyrex. The reason I took it is that if you eat products you are sensitive to, you may increase inflammatory activity in the body which we do not want.

My takeaways are that I shouldn't eat tuna or scallops, and that I am allergic to certain molds. Also that I appear to have a clearly-acquired gelatin sensitivity because of all the capsules I take. Fascinating.

Other interesting tests/metrics:

- Resting heart rate at night. You can measure via the Oura ring or many other devices. Mine is around 55 which is ok, but not great. Kind of irritates me that it isn't better :)
- heart rate variability is an interesting metric that appears to be correlated with health even more than RHR, although I have no idea how to interpret it at this point.
- Blood pressure. Should ideally be on the low end. Mine is typically around 100/60. Can be improved by eating less salt + drinking hibiscus tea, as well as by a lot of the other lifestyle things I list.

There are many other tests I have done, but this is already an incredibly long post.



The key takeaways are that:

1. I have not screwed my health up despite all this crazy stuff I do. In fact, my health seems to be exceptionally good across a large number of tests I have done—a lot of age-correlated markers suggest I am closer to 20 years old, even though I am 32. The markers are also continuing to improve. This suggests I am doing something right.
2. There is a lot of data out there that can help you understand your risks and how to fix them. It is important to know your metrics.

Also here is a framework I like using. Below are all-age causes of death in the US. My markers suggest that I am at extremely low risk for a large number of them, **even in my age group**. So if I maintain a similar set of behaviors (and actually I keep improving every year) I should have low risks in my age group when I am 80 as well unless something screws up.

With the above framework I also identified that my key risk is cancer—which is why I am so focused on low sugar and insulin (which appear to feed cancer preferentially, https://en.wikipedia.org/wiki/Warburg_hypothesis) and my immune system which is somewhat weaker due to CMV, so very interested in iP stem cell therapies that could replenish naive lymphocytes.

I expect that even without major medical progress, I will be in excellent mental/physical condition at 100 and will live longer than any human who has ever lived as of 2017. With tech progress, it seems likely that immortality is reachable.

I could be wrong, but I suspect that today there are fewer than 1000 people out of 7 billion who know as much about their own health as I do. Because of how onerous, expensive, and non-intuitive this is.

But this should become much more mainstream. It really does give you a significant advantage in life across very many areas—thanks to this, I often feel "superhuman" because of how much control I have over my health and behavior relative to what I see in other people. And humans tend to adopt things that enhance their social competitiveness.

I am happy to speak at high-quality events/podcasts, talk with journalists about

personalized patient-driven medicine etc.—feel free to reach out! Best way to reach me is to send me a message on Facebook Messenger (https://www.facebook.com/sergef) or Instagram (https://www.instagram.com/sergefaguet/).

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Other deep-dive articles by Serge:

How I set and execute 50-year goals.
In my previous articles, I talked a lot about how to use biohacking to become more productive, healthier, and more…
hackernoon.com

How to biohack your intelligence—with everything from sex to modafinil to MDMA
I had some free time over the holidays and wrote this article to showcase, on the basis of a personal story, many…
hackernoon.com

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