From “I've Made My Mind Up Now”

by AR

Hacking the genome

Discourses on the subject of evolution often use the famous phrase “survival of the fittest”. This is perhaps one of the most misunderstood (or badly stated) concepts in science.

At first glance, biology cannot evolve the 'perfect' or even an overall ‘fittest’ organism, it can only evolve a constantly different one. There is no such thing as an organism that can survive and thrive in all extremes, because different traits are 'fittest' for different environments in different contexts. Once, in the right place and time and conditions, we were hairier. Once, in the right place and time and conditions, we might be intelligent. Ordinarily, a ‘survival trait’ will not remain a survival trait whenever the organism’s environment is changed, and environments constantly change.

“Survival of the best-suited” is way more accurate than ‘of the fittest’, because ‘fittest’ doesn’t mean ‘fit’ in the healthy physical sense either. A description even closer to the truth would be “survival of the traits that fit a particular environment”. Those traits might be laziness, helplessness, dysfunction or stupidity, if we live in an environment where people with these traits are able to live more comfortably than others and get to reproduce more.

Genetic evolution has no grand drive to achieve the perfection of intelligence as a survival trait specifically, because different traits will be valuable in different environments. This is not, however, true of intelligence itself.

Intelligence, like biological life, simply emerges whenever circumstances permit. The right input to any system will result in the emergence of greater intelligence, either in that system or because of it. But intelligence is an environment hacker. With only the genome your environment can change you, but add intelligence and you can also change your environment.

The genome's job is to adjust the individual organism to better suit its environment. Intelligence and biological life do exactly the opposite: they adjust the environment to better suit their survival. If both are feeding back to each other with good clear signals, we have the perfect balance to develop a highly intelligent organism.

So first of all, understand that the genome in itself isn't the least bit interested in the survival or improvement of intelligence, just as your computer isn't the least bit interested in whether or not you paid for that copy of Windows. The genome doesn't think; it only responds. To it, 'intelligence' is just a trait like any other. If life experience indicates that it's needed, the genome simply receives the signals to develop it and carries out their instructions.

Neither is the genome 'selfish', in fact, it's major problem is that instead of valuing one trait higher than another for overall survival, it assumes that the current perceived environment is reality and provides the proteins for traits necessary in that reality alone (a real bummer if all it sees is television!). It cannot think ahead, and it doesn't give a toss what 'traits' get left behind. The genome is mindless, its mechanical interactions proceeding like the reproduction of crystals; because certain signals are there. Traits like fatness, brute strength, a brief but very fertile lifespan, extreme hairiness, or an aesthetically pleasing appearance are equally as valuable to it as is intelligence, and just as easily cast aside.

There is a blueprint for producing optimal intelligence via brain and mind development in our genome, but its actualization depends (like all other traits) upon the genome getting the signals that say it is necessary.

Currently, most people’s genomes receive the signals that it isn’t. Consequent failure to activate all the required gene transcription factors for optimal intelligence results in sub-optimal brain/mind development and even mental dysfunction as the genome stops producing proteins it thinks are 'not needed'.

Gene transcription for optimal intelligence fails partly because of our not doing the right things to send the right signals, and partly because of doing the wrong things that send the wrong signals (and occupy the receptors).

It’s important to keep these two factors separate. If we want to develop high-functioning intelligence, there are things in our environment (by environment I mean whatever we are surrounded by) that ought not to be there, and there are things missing from our environment that ought to be there.

Nature meets nurture

Gene transcription is where nature meets nurture, full on and with no holds barred, and this is why it can be hacked by intelligence. Nature is the genome itself, the supplier of materials; with a drop-down toolbar so huge that its choices & possibilities couldn’t be gotten onto any screen. It’s like the selection pages for the biggest megastore on the planet. Nurture is the collective methods we think of as what we use to take care of ourselves or others (or others use to take care of us). But in fact ‘nurture’ is the environment in toto.

Nature is biology, nurture is physics. Both count as our environment (remember the environment is everything we are surrounded by, and 'we' are the mind.

This seems a bit weird for some to consider, because the name 'nurture' doesn’t seem to fit the reality; our environment can harm us just as easily as it can benefit us, but that’s how it works with intelligence in the equation.

Right nature (healthy genome) = optimal physical development

No nature (non-functional genome) = no development

Wrong nature (damaged genome) = inappropriate or dysfunctional development

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Right nurture = optimal mental development

No nurture = no development

Wrong nurture = inappropriate or dysfunctional development

Our environment sends the signals and requests to the megastore of choices in the genome and we’re given the proteins & transmitters for 'what seems necessary' based on that information.

The genome responds; it doesn’t think. It works on IF = THEN computation: “IF x happens, THEN do y”; just like evolution in general, whether that be biological evolution, cultural evolution or the evolution of intelligence (and they don’t all have the same aims).

The genome's job is to keep your body alive in the environment it thinks (from what you are telling it) you're living in, and to meanwhile carry the tools for as many 'likely' environments as possible. If it's given the wrong information, it just comes up with the wrong tools. We should be able to select from our environment only those things that keep us healthy, but most folks haven't even gotten as far as knowing what those things are.

The genome makes an assessment of our environment from the signals it receives, just as your shopping begins with an assessment of what you think is necessary. If you're living in a hot dry climate, your shopping needs are very different than if you're living in the arctic, so the genome warehouse expects you to be able to adjust your list of needs accordingly. 'Nature' relies on humans being intelligent enough to be aware of their needs, and it often falls over because, on the whole, they are not. Intelligence can plan ahead, but the genome cannot. It has to wait for the required code before it can release your shopping.

Critical mass

Let's look at this idea in a literal situation. If you're going to walk a high-altitude mountain trail in 6 months' time you know that you're likely to need a rucksack, some waterproof gear, and probably a fitter physical body than the one you have now, but your genome doesn't know any of this; it can only give you the physical tools you need in retrospect after getting the signals The genome will hum along happily unchanged until a change occurs in your environment that gives it the signals to start presenting you with a different set of tools.

So off you go, without preparation, up the mountains. Your biology has a short-term strategy and a long-term strategy for encountering change. Its short-term strategy kicks in as soon as your body notices that it's getting colder and you're not getting quite so much oxygen as it is accustomed to when breathing.

For some reason completely unknown to the genome your body is suddenly demanding more oxygen and more heat generation. It doesn't know why, but it assumes that an environmental factor must be to blame (because it's not getting the signals that would say this is happening because you're ill). It also knows that this has been a sudden change, so it concludes that you have temporarily entered a harsher environment. It knows this doesn't normally happen, so concludes it is a rare short-term event. (The genome doesn't know about jumbo jets and hiking holidays; it's a stone-age genome.)

As a human your brain/body are well designed to cope with such sudden short-term changes in climate and circumstances, so they respond accordingly. The brain will send out the signals that alter you breathing pattern, demand more sleep and rest, make you crave foods that increase your energy and so on. The stress on the body's systems will thus be coped with and relaxed. Your body can do this by simple responsive adjustments of the autonomic nervous system [ANS]. It doesn't have to go to the genome store at all.

But let's say you are on a six-month trip up these mountains. What happens after that first few days? Your body becomes aware that its environment has changed more permanently. This is not just a small bit of weather, it is likely to be your everyday life. Compensation is costly; your metabolism is coping, but it's wasteful and it's producing dangerous side effects like increased free radicals. A critical mass of these feedback signals coming into the brain prompts an excursion to the genome store.

Your brain pulls out its chemical equivalent of an online requisition form and triggers gene transcription sequence cascades. This signals the genome to start producing specific proteins to bring about an overall change. Some adjust your metabolism so that your body can suddenly make better use of the oxygen available to it. Some kick your cardiovascular system into growth mode; it increases in size and so becomes more efficient, your lung capacity improves. Some build more muscle tissue to enable your body to do the work of climbing with less stress, and some recycle more of the nutrients already in your system.

This only happened because of that critical mass of signals from the environment. Without the requisition code signals, the tools in the genome store can sit there all our lives and never be accessed. They are all virtual sets of tools that enable abilities, but they are never actualized unless the genome believes there is need.

That doesn't mean there actually has to be a real life need, it means the genome thinks there is, because it has received those signals. The tools it holds in storage are simply wetware programs that need signal triggers to activate them, and ongoing feedback to calibrate them to optimal levels.

Gene transcription [GT] turns genes on or off, speeds them up or slows them down. Genes make proteins that add or remove tissue (eg more muscle tissue, less fat storing adipose) and structures (eg placenta when pregnant, transmitter receptors) and connections (plasticity of networks enables their molding to optimise current user needs). Different tools make a brain & body more able to survive in new and different environments. This is how the genome attunes us more to our surroundings, and it is the secret behind how we "become what we are surrounded by". Gene transcription causes permanent or long-term changes in our physiology in order to make us more able to thrive. The plasticity of our physiology enables our bodies and brains to change according to 'whatever is necessary'.

We can hack the genome for exactly the same reason that it is susceptible to going wrong -because it depends entirely on signals from the environment.

The dark side of the genome

Perceived exposure to a new environment for long enough triggers gene transcription. 'Environment' includes the chemical environment inside the body and the physical environment outside the body.

When the genome receives the correct signal to transpose a gene or set of genes, it goes ahead and does so regardless of intellect or logic. It can't think, it can only respond. So a genome that is constantly given the signal "Needs to store fat!" can only respond by maintaining our metabolism to store more fat until that signal stops or is contravened by another, which is why some people find it impossible to lose weight (until gene transcription is altered.) The mindless genome will continue releasing proteins to tell the body to store fat until we die of obesity, unaware that it is receiving a false signal caused by insulin/glucose tolerance, in turn caused by many signals from the (wrong) foods we eat.

Wrong nurture = inappropriate or dysfunctional development.

You may live anywhere in the world, but if you eat foods that the genome associates evolutionarily with “chronic nutrient shortages in the environment”, i.e. high GI carbohydrates, your genome thinks you live in a time of famine and builds your physiology accordingly. Sadly, it’s just trying to keep you alive.

Another example of the dark side of the genome can be seen in the timing of puberty. When we’re growing, an ongoing series of gene transcriptions for physical development are 'timed' to respond to certain groups of signals. One important thing for our survival is that our brains are fully mature before we are able to reproduce –that way, our offspring have the best chances of survival.

With optimal nurture it looks like we should become reproductively mature in our early twenties (although we may become sexually active long before that). Unfortunately, the signal for the penultimate spurt of human brain & body growth is the wiring and extensive use of the left frontal lobe. When young people begin reading and writing, this wiring takes place (the genome assuming that it is needed right now). This change enables youngsters to read and write competently, but coming at the wrong time it prevents other networks developing that should be developing, and it also signals the genome that maturity is getting near. The genome expects the main final spurt of neurogenesis to end as puberty begins; about eight or nine years after we begin wiring up the left frontal lobe at around age eleven. (Our brain doesn’t completely finish growing until our mid-twenties, when it turns its attention to thickening connections instead.)

In non-literate cultures, researchers are often baffled by the fact that puberty begins at around age 19-20. In Western society, where we are taught to read and write between three and five, puberty happens between eleven and thirteen (and sometimes, in cases of ‘hothousing’, as early as nine. But when Western children are not taught to read or write in childhood, puberty still begins around age 20.*

Knowing the path & walking the path

In the brain, neurotransmission is also tuned according to whatever your genome thinks your needs are. And this is really where gene transcription NH can be both our greatest asset in developing intelligence or our greatest bane, because the genome cannot respond to intellect. It's no good thinking you should be thinner, or smarter, no matter how much you convince yourself of that, or pretend that you are, it won't make it true.

You may know, intellectually, that for your mountain hike you will need bigger muscles, better muscle tone, an improved cardiovascular system to make the most of low oxygen levels and so on, you can know this very clearly, but you can't make nature respond unless you nurture it –give it the signals it needs to make those changes.

...It's as though there's an incredibly dumb sales clerk on the genome store's front desk. You say, "I'd like some bigger muscles please", and the clerk says, "...Computer says no…You have exactly the relevant muscle size for your lifestyle."

"But I'm going up a mountain," you argue; "I'll need then then!"

"...Computer says no… You have exactly the relevant muscle size for your lifestyle."

So you work out a bit, to try to convince your body that it needs bigger muscles, and you try again…

"...Computer says no… You have exactly the relevant muscle size for your lifestyle."

(Your body thinks this is a short-term need, and has responded by increasing oxygen supply to your muscles when you're exercising. Anaerobic respiration has seen you through the extra stress, and your physique looks just the same.)

After a few weeks of this however-

“...Ooh look! Computer says yes –it does seem that you need bigger muscles for your current lifestyle!”

Gene transcription kicks in –and at some point soon after you’ll notice that your body shape has changed. Your request has been granted. You’ve hacked the genome. You’ve made it believe that you live in a harsher environment than you actually do.

Some gene transcription changes seem to be permanent. Once you have, say, the sensory motor ability to walk, you’re not going to lose that ability (even if your muscles waste away during a long period of bed rest, you’ll pick up the ability again much faster than the first time). But a lot of gene transcription is in an ongoing relationship with feedback in real time from the environment (which is why those muscles do waste away; your body thinks you don’t need them any more –and this is the secret behind the fact -and golden rule in NH- that you must “use it in the right way, or lose it”.)

Gene transcription doesn’t just affect muscle size or cardio-vascular capacity; it affects everything, including the size and density of neural networks, neurotransmitter balance and efficiency, physical form and size, memory, perception, mood, and learning. Your intelligence is dependent on ongoing gene transcription for as long as it is dependent upon biology.

So the next question is obviously: Gene Transcription; how do we hack it?

One way has already been discussed –you can hack the body into believing it is in a different environment by exercising. Your genome doesn’t know you’re on an exercise bike or lifting weights in the gym –all it cares about is the fact that you're experiencing physical stresses that send signals that say these adjustments to the size of your muscles are necessary. Exercise provides the critical mass of trigger signals, and all the genome needs is signals.

Another example: CR (calorie restriction) imposed on the diet triggers a gene transcription factor that alters human metabolism. Once the trigger signal is received and the connected gene transcription has happened, it becomes very difficult to get overweight regardless of what you eat, and it's also more difficult to age rapidly, which is one reason why it has the longevity effects we have heard about in CR mice (although not the only reason, and I wouldn't recommend CR in humans unless it was on the same terms as that of the mice –a low glycemic index diet.)**

Gene transcription is guarding all the doors, it is holding all the keys, to every aspect of physiology you can think of. Without the correct "it's necessary" signal codes, you won't get any keys, but these codes can be forged, and that's what hacking it is all about.

GT (gene transcription) is not just about turning genes on, it's also about turning them off, or changing the speed of their activity.

Before the human genome was thoroughly investigated it was thought that the genome was fixed, i.e., that your genetic code 'preset' you hair color, eye color, sexual characteristics, intelligence, size, body weight, shape and so on. Some genes were known to be dominant and some recessive, but basically whatever you were born with you were stuck with; a short fat child was going to remain a short fat adult and so on. What you were born with was what you got; it couldn't be changed. Now we know that the genome is much more plastic. As we say above; it is a store of potential tools; wetware programs that can be turned on or off or adjusted, by messing. The way in which this works is really quite beautiful.

Transcription happens at the front end of the genome store’s production line, but in fact a cascade of events precede transcription and influence gene regulation. GT factors and activating/deactivating proteins and enzymes are part of that cascade, and consequently genes can be controlled at many different levels; by foods we eat, behaviors we carry out, things we surround ourselves with, and even just by stopping doing some things that were sending the wrong signals.

Changes can be permanent

At the back end of the DNA production line are molecular complexes that once triggered continue to operate in dynamic equilibrium –that is, they need no additional energy to perform their activities. This is how changes to genome expression can become permanent or semi permanent.

Dynamic equilibrium is one of the hallmarks of biological complex networks, from the pre-frontal lobe executive behavioral levels all the way down to the unconscious manipulation of biochemistry.

At the chemical level, the different molecules involved have stronger or weaker affinities for each other that control their association or disassociation on a molecular level. On the macrocosmic scale this produces behavior which can reproduce dynamic equilibrium only when in the mode of interaction based on those very same things –attraction and repulsion. Chemistry is blindly honest about what attracts and repels its molecules, and for optimal function, humans must be just as discriminative in their behavior.

All of our input, absolutely all of it affects gene regulation because transcription factors rely on feedback via the nature/nurture interface; the flow of signals between an organism and its environment, and those all-important 'critical mass' events of signaling. Changes in our behavior cause changes in our bodies & brains that are monitored by the nervous system, and any sufficient change (critical mass of signals) from our perceived environment causes a change in the behavior of gene transcription factors. Once a change has taken place though, it will establish a new dynamic equilibrium and maintain itself unless another critical mass of signals overwrites it. That's why the low GI diet doesn't need to be a constant; all you need to do is send the critical mass of signals by eating total GI for a while, then you can more or less eat whatever you like as long as you keep to mainly low GI foods. If you accidentally go over the top and reverse the transcription, it's another few months on low GI for you! Eventually you'll find out pretty much exactly how much crap you can eat each week without upsetting the genome.

Hacking the genome & brain development

In the brain, GT factors are adjusted constantly during the development of our intelligence in order to promote the growth of each part of the brain as it is perceived to be needed. If the genome does not receive the signal that a network is needed, that network will not develop.

For example, the trigger for gene transcription enabling the development of our sensory motor networks is literally sensory input. We need our environment to provide things for us to smell, taste, touch, see and hear in order to transcribe the correct bits of DNA to build those neural nets. The signals from these inputs determine the genetic responses that produce the proteins that grow the networks. Without the signals, we will be deficient in those networks. This is why kittens raised in environments with only vertical stripes cannot see horizontally oriented objects as adult cats; they will run accurately between upright posts but walk slap bang into horizontal rungs on chairs or ladders. No network has been built in their brains for the visual processing of horizontally oriented objects; the cats are effectively blind to such objects.

This rule holds for all experience. For example if we are only exposed to sentiment and never experience any examples of real emotion, we will be unable to detect the difference in later life because we have as yet no network for processing or even detecting genuine emotion. We are as blind to the existence of real emotion as the cats were to horizontal objects, and we won't get anywhere until we accept that. We have to accept that we must learn emotion just as we would have to learn another language (or we will forever fail to understand what is said to us in that unknown language).

…No wonder people find it difficult to understand many of the concepts raised in Matrix Theory! There are as yet no networks for practising the skills we are supposed to have! We are 'flying by the seat of our pants'; going on pure belief in the viability of scientific theory whilst building those networks, and only after some time will they begin to function and the related concepts then begin to make sense! To get them built, we have to take control of the current networks used for things such as sentiment, and it feels for a while as though we are wiping bits of our personality and have nothing to replace them with.

Once we experience the first changes, it becomes a lot easier, but until then we are like people who have only ever seen in monochrome, being told to turn the monochrome (sentiment) off so that the wires can be used for color vision (emotion).

Here is where hacking comes in to help make the transition. The parent who moves a baby’s limbs in walking motions when that baby is learning to walk is hacking the genome into thinking that the tools for walking are necessary right now, the number of signals reaches critical mass, and transcription happens earlier. The baby learns to walk with greater ease because the neural networks are already half built because of this input, and s/he progresses quickly with practice and variation. Conversely, the baby left lying in a cot has no example patterns of motion for a network to begin with, and learning to walk is arduous and slow. Adults get bored with waiting and plonk baby in a buggy, restricting practice and reducing the number of signals. No network for walking can be built, and such children can be seen everywhere struggling to get out of prams, anxious and fretful, and later, as uncoordinated, anxious and clumsy walkers with no muscle tone, athletic grace or sense of rhythm. They clump around as though their feet are in cement and they fall over a lot.

By manipulating a baby’s limbs in a foot-pushing game, or paying attention to and copying an example of genuine emotion in role play, you are ‘behaving as though’ baby were walking or 'behaving as though' you naturally thought & felt that way all the time. This is creative play. The brain still builds the networks because the signals reach critical mass (practice makes perfect) and the genome is fooled into transcription. The game changes reality. Your genome doesn’t know you’re choosing to do this on purpose, it merely registers that certain changes are necessary and adjusts gene transcription factors, doing all the work for you once you’ve gone halfway. All you have to do, is play.

By working out in the gym, you create a bond, or bridge, between your body as it is now, and your body as it will be when fitter. There are enough points of similarity between these two states for your physiology to jump the gap and take you there, and at some unremarkable point you will notice that it has happened. You have become that fitter person.

What you don’t see is the immense amount of work that has gone on underneath in order to achieve this, and that’s fine, because that’s your physiology’s job, just as playing is yours.

All of this is neurohacking, (because neurons make up your entire nervous system, not just your brain). You're 'interfering with the structure and function of neurons' all the way along. But this is still doing it the hard way. It's not a bad way (although there are bad ways to hack GT –steroid use being one example; 'bad' not because it transcribes genes for bulk muscle production but because it turns on other genes as a side effect that cause premature ageing and other damage), it's just the hard way -and there are easier ways.

DNA codes for hardware, including things like muscles and neural nets, and the hard way of hacking is to hack hardware with hardware (signal the genome via physical signals). But signals for growing hardware are also producable by software (habits of thought). The hardware that is present dictates what kind of software can run, but the reciprocal nature of their influence enables us to alter either via the other.

The genome's not discriminative, it will listen to signals from any input, which is why even watching movies of someone working out and imagining it is you, will do some of the work for you, and the better your imagination is, the better it will work. Doing that and working out for real will develop your muscles (or your emotional maturity) in half the time it takes with practice alone, and with half the physical effort.

The crux of the matter is that imagination affects gene transcription. Here, your imagination provides the input.

Now you might think this is a scary place to play, -what if you're paranoid or hypochondriac and imagine you have cancer, for example –could that make you more susceptible to cancer? Yes it could, but the plain truth of the matter is that imagination affects gene transcription whether you control it or not, and that's why it's so vital to control your input including your own thoughts.

You have no choice but to be in this ship, so you might as well take the helm and make it go where you want it to go instead of drifting at the mercy of life's currents. In control, you can steer towards fun, healthy and beneficial places!

There are many different ways to hack the genome in the functionality of the brain. The best place to start is to learn what gene complexes are involved in the particular areas you want to improve. Obviously those areas won't be the same for everyone, but the methods are. Controlling the expression of all genes or groups of genes are the transcription factors, and they are our gateway to change.

Knowing the path & walking the path

New genetic correlates to physiological change have, since the human genome project got its first working draft, been discovered almost weekly. We already have some very valuable basic hacks. I'm going to cover three here that I consider to be the most important. You don't need to know the molecular details to use them any more than you need to understand how a computer works in intricate detail order to use one, so I'm looking at them from a practical n-hacking point of view rather than a detailed scientific one. If anyone wants greater detail, I'm happy to discuss that outside this book .

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SIR2 –Glucose/insulin tolerance and ageing

This is a major hack for body and mind. A 'CR' diet in mice appears to slow down metabolism, reduce free radical damage, and predispose the mammals to longevity. Why?

Scientists have known for several years that an extra copy of the SIR2 gene (SIRT1 is the human equivalent) can promote longevity in yeast, worms and fruit flies. But having 2 x SIRT1 seems to have a similar life-extending effect to a peculiar hack that includes its deletion!

Deleting the gene altogether and using caloric restriction and/or a mutation in one or two genes that control the storage of nutrients and resistance to cell damage (RAS2 and SCH9), resulted in a dramatically extended life span; up to six times longer than normal - one of the longest recorded life-span extensions in any organism. Human cells with reduced SIRT1 activity also appear to confirm that SIRT1 has a pro-aging effect.

These findings do not negate discoveries of a moderate increase in life span when SIRT1 is over-expressed.; it just shows that there are possibly greater potential benefits in tweaking it in the opposite direction.

It's possible that SIRT1, in response to transcriptional signaling frequency or type may block the organism from entering an extreme “growth & repair” survival mode (characterized by absence of reproduction, improved DNA repair, increased sleep, less motion, and increased protection against cell damage). Organisms usually enter this mode in response to extreme heat/cold or starvation and show extraordinary resilience under stress. Biology, if it thought consciously, would be thinking, “There are not enough resources to thrive. I will cut all non-essential systems in favor of self care until conditions improve."

The potential benefit of Calorie Restriction (60% of ‘normal’ while maintaining a healthy diet rich in vitamins, minerals, and other nutrients) is obvious as a strategy that consistently prolongs life and reduces the risk of cancer, diabetes, and cardiovascular disease, while staving off age-related neurodegeneration. So it’s great that some people are already trying out CR, but what is surprising is the continuing lack of awareness (even among researchers) that a low GI diet achieves exactly the same aim. In fact, low GI diets appear to achieve better results than calorie restriction for longevity and avoidance of disease.

Low GI dieting may activate aspects of this response mode, such as stress resistance, even when food is plentiful. With optimal nutrition, all organisms have the ability to repair harmful mutations in their DNA, whether caused by age, radiation, diet or other environmental factors. (Cancer often begins when DNA mutations outstrip a cell's ability to remain differentiated.)

Any diet providing a certain mix of nutrients and avoiding certain substances will produce an inner chemistry that sets up gene transcription factors. You don’t need to know what complex of genes are affected or what they do to make this happen, you just have to eat the same goddamned goop every day until it happens. The “same goddamned goop” is simply a ratio of 1: 2, protein : low-GI carbs (fruit & veg), a handful of nuts now and again, and NO (here’s the hard part) other stuff.

That means no chips, alcohol, pasta, white bread, corn products or rice, and everything that you fry, you fry slowly in olive oil. Nothing with fast-release sugars in it must pass your lips.

The good news is, once you log the signs that gene transcription has happened and shifted your metabolism (your body temperature will be up to two degrees lower than ‘normal’ and your BP will be slightly lower too) you’ll know you’ve hacked the genome into thinking that you need to stop storing fat and live longer instead. At that point, you can stop the hack. You’ll still need to eat low GIs, but you can mix them with high GIs as well, so you can eat, for example, fruit with cake or ice cream, burgers and chips with a big load of salad and cheese, rice with chicken and veg, and so on. All you have to do is check your body temp. and BP are still slightly lower than ‘normal’ once a month. (If it goes up to normal you stop eating shite until it’s slightly lower again.) You keep the expression of the genome under control and that controls the rest by default. (This is not a ‘CR’ diet, although it may be fewer calories than you are used to if you overeat. Low GI seems to be the safest way to achieve these changes without unwanted side effects.)

CaMKII and memory/learning/LTP

The process of putting stuff into long term memory requires gene transcription factors in the production of new proteins, specifically kinases that affect the rate of calcium uptake into the cell. Hack these factors and you hack the learning process. You also hack, by accident, memory (as is often the case in n-hacking).

The initial 10 min of memory formation and long-term potentiation are sensitive to inducible genetic upregulation of αCaMKII (Ca^{2+}/calmodulin-dependent protein kinase II) activity. CaMK II decodes Ca^{2+} signals in neurons and modifies synaptic structures and function.

Interfering with this production of new proteins can be done in both directions. Some drugs [cyclohexamine, ketamine, and certain beta blockers] prevent long-term memory formation or reformation after recall, by interfering with transcription in a restricting way.

But we can also interfere and induce speedier learning and improve memory by (a) providing the precursors for the neurochemicals that need to be made [vitamin Bs, acetylcholine, calcium], (b) using the system (practice, and imagination as input, sends the correct signals again and again), (c) making sure we sleep after each learning session in order to take advantage of consolidation in assimilating and formatting memories expediently, and (d) using drugs directly to stimulate the CaMK II phosphorylation process [glutamate, NMDA].

All of these steps will increase the likelihood of gene transcription. All you will notice is that your memory seems to have improved, but gene transcription will be why.

Serotonin/oxytocin tweaking and social status/confidence

A particular kind of social input (recognition, respect, trust, esteem, appreciation) affects a change in gene expression that improves your immune system, reduces anxiety, and increases serotonin and oxytocin; all of which helps your confidence.

This example may seem like a pointless one because, you may think, you can't force people to respect you, value you or hold you in esteem, so what's the point knowing what such social treatment achieves?

The point is, there is a way to provide that input without going anywhere outside yourself. Self-esteem, self-respect and so on are just as effective as signals for the genome, regardless of their source. What's more, it's a bit of a self-fulfilling prophecy. Once you get the hang of 'behaving as though' you are worthy of trust, respect and esteem (and, in reality, you are), others begin to treat you in a more positive way and feedback happens. They'll do this unconsciously, partly because their biochemistry will be aware of your pheromonal signature and when your serotonin and oxytocin levels are healthy that shows up in your pheromonal chemistry, partly because of your body language and your underlying awareness of your status, and partly because your actions are as competent as your attitude is confident. Everything about you is signaling "worthy of respect". At some point, a transcription factor will trip and you'll no longer have to 'behave as though'; you will genuinely feel that way more consistently without any effort. Your neurotransmitter levels will have increased and your self confidence accordingly. Shyness and paranoia will be things of the past.

I hope you now know enough about hacking the genome to want to know more. Epigenetics is one of the greatest tools for NH and is currently greatly underestimated. Our generation is the first to have access to this information, and I for one intend to make the most of it.

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54kg and confident of remembering how to stay there

London 2010

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Footnotes

* I have personally done this experiment twice; those concerned learned to read at ages ten and eleven respectively. As a bonus, myopia doesn't happen at all.

** CR can trigger the gene transcription under discussion here, but 'CR' is a very broad term, and some CR diets are positively harmful. In theory, one could live entirely on carrots and still be on a 'CR' diet, which is obviously absurd, so if exploring this do be careful to find out all the facts first. It's not quantity of foods consumed that causes weight problems and ageing, it's quality of foods.