Lifestyle changes can't alter DNA: Claiming it can is a public disservice

If you've got a health concern, there's a supplement out there for you. Unfortunately, most of them come with no clinical trials, no vetting of safety information and certainly no follow up data. But perhaps one of the most bogus claims I've ever seen is the notion that using supplements to balance the body's hormones would 'heal' a person's DNA.

Naturopath Alan Christianson wrote just such a thing in a three part series on the health of the thyroid and adrenal glands this week on Huffington Post. The thyroid and adrenal glands are powerful hormone makers. Their hormones control myriad elements of metabolism. In Part One of his blog he describes the thyroid and adrenal glands and their impacts on health and quality of life. There's some information here that's not as clear in the scientific literature as Christianson makes it seem, but largely it's okay.

The trouble comes when he starts Part Two. "This second installment will allow you to understand how your DNA, the very code of life that allows you to thrive, can be healed and how your thyroid can help," Christianson writes.

Let's unpack this statement: What could he possibly mean by heal your DNA? Does he mean changing the mutations in the genome that can cause harmful health issues. The field of gene therapy has been working on that for decades, and only a few treatments capable of doing that have been developed. The symptoms that Christianson mentioned—fatigue, weight gain, hair loss, insomnia—are not caused by one gene. We have no idea how many are involved. It could be dozens or thousands.

No lifestyle intervention is going to chemically change the structure of a gene to switch out a bad base pair and put in a good one. That's just not how the system works.

Christians goes on to be more specific. He's referring to epigenetics. Basically, how DNA is folded in each of our cells affects which genes are turned on… meaning a lot of protein is getting made from them… or turned off. Our lifestyle and environment do play a role here. They turn on some genes, turn off others and set or reset the volume of others still.

"Epigenetics are always changing to real time information about your health and can cause the same gene to act in thousands of different ways," Christianson writes.

'Thousands of different ways' seems like a stretch. But if we're talking about a whole network of genes involved in a certain trait, Christiansons' thousand estimate is probably correct.

But then he turns back to faulty language: "Getting specific care for your thyroid will be a critical step in making your genes happy." What is a happy gene? If he means that a harmful mutation in a gene was erased, he's completely wrong. If he means turning the volume down on a gene that makes a harmful protein, he could be right. But because he isn't clear, we can't possibly know his meaning.

Christianson does present an interesting synthesis of ideas we hear every day. We know having certain genetic mutations puts us at higher risk for health issues. We know that some lifestyle choices do the

same. But we largely discuss them as separate issues. Even within the medical research community, lifestyle is studied and genes are studied, but their relationships are just coming into focus. Figuring out how lifestyle changes combine with specific genetic profiles is likely to be the key to effective, efficient and lasting health interventions.

It's true, for example, that when people lose a lot of weight, or have an infection or start exercise regularly they begin expressing genes in different patterns. It's impossible to say that these are though epigenetic processes alone or other physiological and metabolic factors like the microbiome's reaction to weight loss.

But Christianson should certainly not claim that adopting healthy lifestyle habits or taking any number of vitamins an supplements is going to heal or repair DNA. One may react to these interventions and they may begin to express proteins differently, but they won't be able to change the genetic blueprint lodged at the center of every cell in the body.

The connections Christianson makes between symptoms, lifestyle and the health and function of these endocrine glands are a little dubious, too. These, he claims are the pathways with which we can change genes. We don't yet know the exact relationship between fatigue, the thyroid and the epigenetic markers surrounding certain genes. Christianson, for example, recommends adhering to a set schedule for wake, sleep and mealtimes. That will likely help a certain set of people feel more energized. That's a great thing. But that same intervention won't edit the gene network that caused the individual to be at higher risk for sleepiness in the first place.

This is not to say that lifestyle interventions are weak or unimportant. To the contrary, they are the most effective ways to treat some diseases and reduce the risk of others. But nothing, neither medication nor marathon running is going to fundamentally alter your DNA. Christianson is correct however, when he says lifestyle can change what your body makes of it.

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Additional Resources:

- How epigenetics, our gut microbiome and the environment interact to change our lives, Genetic Literacy Project
- Gut bacteria easy scapegoat to explain diseases, but connections hard to prove, Genetic Literacy Project
- Epigenetics and disease: What it takes to get on the long road ahead, Genetics Literacy Project