

Epigenetics

By Dr. Mercola

How much control do you really have over your own life in general, and your health in particular? These questions have puzzled many since the beginning of time. Now, the emerging science of epigenetics is offering some answers that put true control within your reach.

According to some scientists, changing your health may be as "simple" as changing your thoughts and beliefs.

"Contrary to what many people are being led to believe, a lot of emphasis placed on genes determining human behavior is nothing but theory and doctrine," writes Konstantin Eriksenⁱ. "We are free to make decisions that impact our lives and those of others. ... Our beliefs can change our biology. We have the power to heal ourselves, increase our feelings of self-worth and improve our emotional state."

Epigenetics Shatters "The Central Dogma"

Eriksen goes on to discuss something called "The Central Dogma" of molecular biology, which states that biological information is transferred sequentially and only in one direction (from DNA to RNA to proteins).

The ramification of buying into the central dogma is that it leads to belief in absolute determinism, which leaves you utterly powerless to do anything about the health of your body; it's all driven by your genetic code, which you were born with.

However, scientists have completely shattered this dogma and proven it false. You actually have a tremendous amount of control over how your genetic traits are expressed—from how you think to what you eat and the environment you live in.

You may recall the Human Genome Projectⁱⁱ, which was launched in 1990 and completed in 2003. The mission was to map out all human genes and their interactions, which would then serve as the basis for curing virtually any disease. Alas, not only did they realize the human body consists of far fewer genes than previously believed, they also discovered that these genes do not operate as previously predicted.

In the featured article, Eriksen describes the experiments of John Cairns, a British molecular biologist who in 1988 produced compelling evidence that our responses to our environment determine the expression of our genes. A radical thought, for sure, but one that has been proven correct on multiple occasions since then.

Eriksen writesⁱⁱⁱ:

"Cairns took bacteria whose genes did not allow them to produce lactase, the enzyme needed to digest milk sugar, and placed them in petri dishes where the only food present was lactase. Much to his astonishment, within a few days, all of the petri dishes had been colonized by the bacteria and they were eating lactose. The bacterial DNA had changed in response to its environment. This experiment has been replicated many times and they have not found a

better explanation than this obvious fact – that even primitive organisms can evolve consciously.

So, information flows in both directions, from DNA to proteins and from proteins to DNA, contradicting the "central dogma." Genes can be activated and de-activated by signals from the environment. The consciousness of the cell is inside the cell's membrane. Each and every cell in our bodies has a type of consciousness. Genes change their expression depending on what is happening outside our cells and even outside our bodies."

Your Emotions Regulate Your Genetic Expression

As if genes changing expression in response to environmental factors such as nutrients wasn't enough, other researchers have demonstrated that this "environment" that your genes respond to also includes your conscious thoughts, emotions, and unconscious beliefs. Cellular biologist Bruce Lipton, PhD., is one of the leading authorities on how emotions can regulate genetic expression, which are explained in-depth in his excellent books *The Biology of Belief*, and *Spontaneous Evolution*.

Science has indeed taken us far beyond Newtonian physics, which says you live in a mechanical universe. According to this belief, your body is just a biological machine, so by modifying the parts of the machine, you can modify your health. Also, as a biological machine, your body is thought to respond to physical "things" like the active chemicals in drugs, and by adjusting the drugs that modify your machinery, doctors can modify and control health. However, with the advent of quantum physics, scientists have realized the flaws in Newtonian physics, as quantum physics shows us that the invisible, immaterial realm is actually far more important than the material realm. In fact, your thoughts may shape your environment far more than physical matter!

According to Dr. Lipton, the true secret to life does not lie within your DNA, but rather within the mechanisms of your cell membrane.

Each cell membrane has receptors that pick up various environmental signals, and this mechanism controls the "reading" of the genes inside your cells. Your cells can choose to read or not read the genetic blueprint depending on the signals being received from the environment. So having a "cancer program" in your DNA does not automatically mean you're destined to get cancer. Far from it. This genetic information does not ever have to be expressed...

What this all means is that you are not controlled by your genetic makeup. Instead, your genetic readout (which genes are turned "on" and which are turned "off") is primarily determined by your thoughts, attitudes, and perceptions!

The major problem with believing the myth that your genes control your life is that you become a victim of your heredity. Since you can't change your genes, it essentially means that your life is predetermined, and therefore you have very little control over your health. With any luck, modern medicine will find the gene responsible and be able to alter it, or devise some other form of drug to modify your body's chemistry, but aside from that, you're out of luck... The new science, however, reveals that *your perceptions control your biology*, and this places you in the driver's seat, because if you can change your perceptions, you can shape and direct your own genetic readout.

This new science also reveals that you are in fact an extension of your environment, which includes everything from your thoughts and belief systems, to toxic exposures and exposure to sunlight, exercise, and, of course, everything you choose to put onto and into your body. As Dr. Lipton is fond of saying, the new biology moves you out of victimhood and into Mastery—mastery over your own health.

It is a supreme confirmation of my favorite saying, "You Can Take Control of Your Health."

How Nutrition Alters Genetic Expression

Two years ago, a study performed by the Linus Pauling Institute at Oregon State University was showcased at the annual Experimental Biology convention. The study demonstrated how "histone modifications" can impact the expression of many degenerative diseases, ranging from cancer and heart disease to bipolar disorder and even aging itself. According to Rod Dashwood, a professor of environmental and molecular toxicology and head of LPI's Cancer Chemoprotection Program, as quoted in a press release³⁶:

"We believe that many diseases that have aberrant gene expression at their root can be linked to how DNA is packaged, and the actions of enzymes such as histone deacetylases, or HDACs. As recently as 10 years ago we knew almost nothing about HDAC dysregulation in cancer or other diseases, but it's now one of the most promising areas of health-related research."

In a nutshell, we all have tumor suppressor genes, and these genes are capable of stopping cancer cells in their tracks. These genes are present in every cell in your body, but so are proteins called "histones." As Dr. Jean-Pierre Issa at the M.D. Anderson Cancer Center explains³⁷, histones can "hug" DNA so tightly that it becomes "hidden from view for the cell." If a tumor suppressor gene is hidden, it cannot be utilized, and in this way too much histone will "turn off" these cancer suppressors, and allow cancer cells to proliferate.

Now here's where epigenetics comes in ... certain foods, such as [broccoli](#) and other cruciferous vegetables, garlic, and onions contain substances that act as histone inhibitors, which essentially block the histone, allowing your tumor suppressor genes to activate and fight cancer. By regularly consuming these foods, you are naturally supporting your body's ability to fight tumors.

Certain alternative oncologists also tap directly into the epigenetic mechanism, such as [Dr. Nicholas Gonzalez](#), who uses a three-pronged approach to cancer based primarily on nutrition and detoxification, and [Dr. Stanislaw Burzynski](#), who treats cancer with a gene-targeted approach. His treatment uses non-toxic peptides and amino acids, known as antineoplastons, which act as genetic switches that turn your tumor suppressor genes "on."

A Healthy Lifestyle Supports Healthy Genetic Expression

So the good news is that *you are in control of your genes* ... You can alter them on a regular basis, depending on the foods you eat, the air you breathe, and the thoughts you think. It's your environment and lifestyle that dictates your tendency to express disease, and this new realization is set to make major waves in the future of disease prevention -- including one day educating people on how to fight disease at the epigenetic level. When a disease occurs, the solution, according to epigenetic therapy, is simply to "remind" your affected cells (change

its environmental instructions) of its healthy function, so they can go back to being normal cells instead of diseased cells.

You can begin to do this on your own, long before you manifest a disease. By leading a healthy lifestyle, with high quality nutrition, exercise, limited exposure to toxins, and a positive mental attitude, you encourage your genes to express positive, disease-fighting behaviors.

This is what preventive medicine is all about. It's not about taking any one particular nutrient as a supplement to fix one specific "part" of your biological machinery... The more people become willing to embrace this simple truth, the healthier everyone will get.

It's also worth pointing out that epigenetic effects begin *before* birth.

Epigenetic research from 2009 showed that rat fetuses receiving poor [nutrition in the womb](#) become genetically primed for a nutrition-poor environment. As a result of this genetic adaptation, the rats tended to be smaller. They were also at higher risk for a host of health problems throughout their lives, such as diabetes, growth retardation, cardiovascular disease, obesity, and neurodevelopmental delays. Again, while some are tempted to blame such "predispositions" on bad genes, the KEY factor is nutrition, i.e. the cellular environment.

If you're ready to address your dietary choices, read through my comprehensive [nutrition plan](#), which will give you tips and tools for eating healthy, dealing with stress, and living a lifestyle that will support your epigenetic health.

You can also turn your genes off and on with your emotions too. Many, if not most people carry emotional scars; traumas that can adversely affect health. Using techniques like energy psychology, you can go in and correct the trauma and help regulate your genetic expression. My favorite technique for this is the [Emotional Freedom Technique \(EFT\)](#), but there are many others. Choose whichever one appeals to you, and if you don't sense any benefits, try another, until you find what works best for you.

Please, remember that 'You CAN Take Control of Your Health.'