

# Epigenetics:

a new concept

# What is epigenetics?

This is the name given to a branch of genetics that studies the factors that do not directly modify our genes (and those of other living beings), but rather the way they express themselves. Simply put, DNA is a very long code that contains everything we are: the color of our eyes, how much hair we have, how a medication affects us...

The information contained in DNA is called an **agenotype** and is the same for all our cells. However, the expression of this information can be different depending on the cell, the state it is in or other factors. This expression is called **phenotype**. With the same genotype, different characteristics can be observed thanks to the variation of phenotypes. For example, there are animals that change their coat or color during the winter.

Or even with age, the way our body reacts changes, but the genetic information will always remain the same until we die. However, the genetic information will always remain the same until we die, and we owe these changes to the way we express this information (the phenotype). Epigenetics, therefore, studies the way in which different expressions are produced and the factors that cause them without directly modifying the DNA.

Among these factors there are several mechanisms, of which the demethylation mechanism is the main one. This consists of placing a methyl tail, i.e., a molecule, which serves as a "cap" to prevent the enzymes and proteins in charge of reading the coded material from reaching the right place. In this way the gene is silenced. Epigenetics works mainly with this mechanism and others associated with it, but it is only the tip of a huge iceberg.

When we hear phrases like "we really are our DNA", such expressions are not entirely correct. Because what we really are is how our DNA expresses itself.

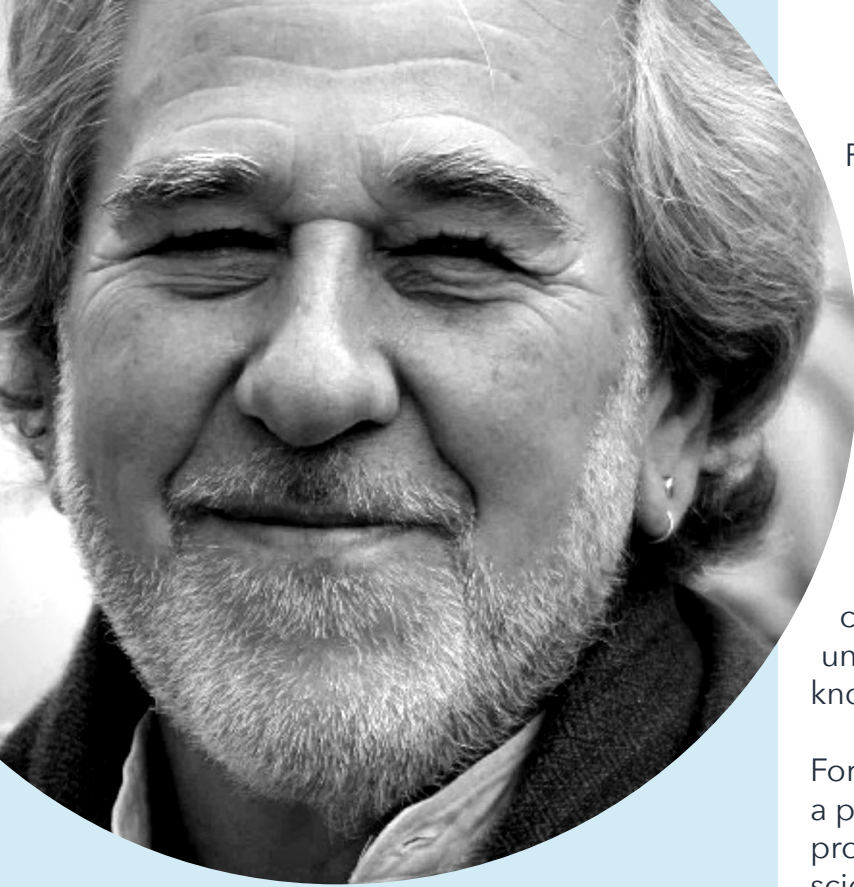
**...we really are is how our DNA expresses itself.**

Although it is not always possible, most of the time controlling expression means controlling the way our body acts. Therefore, if we control how things happen, we control what happens and, therefore, what we are. That is the utility that can occur to us most immediately. But going a little deeper, epigenetics has discovered a completely new field within the world of genetics.

First, it has challenged everything we knew about character inheritance.

**Two monozygotic twins who share 100% of their genes may evolve differently depending on their environmental and emotional conditions.**





**Dr. Bruce Lipton is a cell biologist, researcher at Stanford University School of Medicine and author of the book "The biology of belief" (2005).**

Secondly, it has unveiled new mechanisms used by our body (and that of other living beings) to function. For example, although we thought it was not possible, we have discovered acquired traits, i.e., learned or earned characteristics, which can be inherited, something unthinkable sixty years ago.

We have also discovered mechanisms that until now were mysterious but that we are constantly observing (the change of fur in animals as winter arrives, the flowering of certain plants, behavioral changes...). Unraveling how epigenetic mechanisms work is helping us to find new treatments and ways to solve problems, diseases and other human issues.

All this is just the landscape that the scientific world around epigenetics paints. The latest discoveries in this field are quite astonishing. For example, one study is working on memories and the ability to inherit them. Just as it sounds.

Recently, another study clarified the genetic and epigenetic bases of wheat, so that in the near future, we may be able to work with this plant to make it bear more fruit and resist better without having to modify it genetically. Epigenetics has also solved some questions concerning obesity or even the manifestation of certain psychological pathologies. The cure for the mysterious diseases related to premature aging have their stakes in this scientific branch. It has also helped to clarify some effects on our physiology that until now seemed impossible and now we know that it is just a matter of expression.

For all these reasons, epigenetics is gaining a privileged place in the scientific world, probably marking a new era of unparalleled scientific advances.

Dr. Bruce Lipton conducted a series of groundbreaking studies on the cell membrane, which revealed that this outer layer of cells is an organic counterpart of a computer chip, the cellular equivalent of the human brain. His studies revealed that the environment, which operates through the cell membrane, controls the cell's behavior and physiology, turning genes on and off.

He applied a basic concept of quantum physics to the field of cell biology:

**...the quantum universe is a set of probabilities susceptible to the observer's thoughts.**

**Dr. Bruce Lipton**



"...the quantum universe is a set of probabilities susceptible to the observer's thoughts."

While traditional cell biology dealt with the physical molecules that control biology, Lipton focused on the chemical and electromagnetic patterns through which energy in the form of our thoughts and emotions can affect our biology, including the human genome.

The novel issue is that their discoveries indicate that the mind controls the functions of the body and that implies that our bodies can be modified as we change our way of thinking.

Our emotions interact with infinite probabilities and these affect the cells of our bodies contributing to the expression of different genetic potentials.



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