

## Epigenetics - How to lead our lives



Most scientists are convinced that living beings are a product of their genes and that we are predetermined by a genetic program inherited from our ancestors, condemned to suffer. The last 20 years of biological research have completely transformed this belief. They have shown that we can be proactive in our lives, transform ourselves, change our behaviors, and to go beyond ourselves towards sometimes unsuspected horizons. The research of Dr. Bruce Lipton (1) has revealed that the environment in which the cellular membrane operates controls the behavior and physiology of the cell, activating and deactivating the genes. These discoveries are opposed to the opinion of established scientists who claim that life is controlled by the genes, highlighting epigenetic science as one of the most important field of studies today.

“The discovery of the impact of the environment on the functioning of the cells radically changes the idea we have about the immutability of the genetic code. It is also a proof that emotions regulate the expressions of the genes. (...) Whatever their content, our thoughts penetrate the body in the form of energy - an emotional, mental, psychological or spiritual energy. It leads to biological reactions that later are registered in the memory of the cells. This is how our biography is gradually adjusted to the biological systems, and this is achieved as the days go by.”

Epigenetics is defined as the science that studies transmissible and reversible changes in the expression of the genes, which are not accompanied by a change in the genetic medium, that is, without changing the DNA. These changes can happen spontaneously or as a result of stress, as a response to an environment and other external factors. Epigenetic phenomena act as interrupters, they activate and deactivate the expression of the genes, depending on the circumstances, and in various degrees. Consequently, they allow many unprogrammed combinations between genes, through the phenomenon of methylation (2).

Although discoveries related to epigenetics are relatively recent, the concept was brought up in 1942 by Conrad Hal Waddington (3), (from Greek *epi*, “Beyond”: beyond genetics). Epigenetics encompasses properties, a code over a code, as Joel de Rosnay explains very well in his last book *The Symphony of the Living World* (4): it is a biological “meta-software”, that profoundly changes the classical view of the genes. Epigenetic change is not a mutation, but a modulation of the expression of the genes through behavior or environment. Genetics and epigenetics are compared to the texts of a book and the process of reading, in which every individual interprets

the book in a different way, through their experience, their imagination... Others compare genetics with a partiture, and epigenetics with the interpretation of the symphony. The big question is how to become the director of the orchestra of one's own partiture.

What we experience influences our physical state, our psychological state, our life course and our mind and plays an important role in the epigenetic modulation of the expression of the genes.

We inherit our genome, but we have the freedom to act over our epigenome, on an individual and collective level, and in the evolution of our society, in accordance with the interactions we establish with each other. These phenomena can be amplified today, to one direction or another, through the use of social networks. In the epigenetic world, everything is reversible, which emphasizes the importance of taking responsibility over our lives and to clarify our choices. Our behavior and our will to act can transform us. With epigenetics, we can redirect the negative "psychosomatic" processes in a direction that benefits our health and our mental equilibrium.

The five key words for a successful reorientation are nutrition, exercise, anti-stress, pleasure and harmony. They interact harmoniously and require a discipline of life that the ancients of the East and the West have recommended as preventative approaches, having interest in the mutual influence between the mind and the body.

Current studies demonstrate that the ancestral practices of meditation, yoga, forms of dynamic meditations such as Tai chi chuan and Qi Gong can have positive effects on the metabolism of our body and over some disfunctions, such as hypertension. Thanks to these studies, ancient wisdoms and new discoveries have found a point of convergence.

Today we know that all these techniques for the relaxation of the body and the regulation of breathing allow us to reach a high level, both of concentration, as well as relaxation, and that patients, especially those with cancer, having practiced them, together with a healthy nutrition, were able to modify their cancerous cells, making them normal again. Recent studies have also demonstrated that, in situations of great stress, such as in the case of victims of the holocaust or of hunger, genetic modifications can be inherited for generations by those who have not lived it, but today we know, reversal is possible.

Therefore, nutritional habits, physical activity, pollution, stress, worries, our social and family relationships and happy and unhappy events can influence our life course and our state of mind and carry out an important role in the epigenetic modulation of the expression of our genes. Therefore, to be surrounded by true friends or to live a stable emotional life, to flourish internally, can only have beneficial effects, not only on our physical health, but also on our health in general.

Dawson Church (5) describes how our mental state influences our genes. He demonstrates that beliefs, intentions, meditation, altruism, optimism, cooperation, confidence... have a consequent effect on the genes of stress, which are especially involved in the processes of aging and immunity.

In conclusion, the relation that we establish with our external and internal environment is crucial to help us transform ourselves and to extract everything that stimulates the elevation of our self.

This is also a collective challenge. It is essential to understand that we cannot just change ourselves individually, but we need to change also the way we live together. To do this, we must reconnect ourselves with higher objectives, as colonel Arnaud Beltrame demonstrated with his self-sacrifice (6). The entire nation is grateful for heroic people. He knew how to confront the challenge that is imposed on us: to find the delicate equilibrium between liberty and security. His example allowed us to take in account that other approaches are possible and that we should never bow to fate.

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