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Editorial

The Potential Role of Epigenetics in the Welfare and Behavior of Mammals

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The term "epigenetic" was introduced by Conrad Waddington in the early 1940s who have suggested the involvement of external agents in the modulation of the individuals' epigenotype. Since then, several studies have benefited and strengthened with this knowledge. Among them, we can mention the enormous progress of evolutionary studies, developmental biology, and cancer research, which have broken enormous barriers, explaining phenotypes not caused by Mendelian inheritance.

The welfare and behavior of individuals are linked to their ability to adapt to the environment in which they live. In this sense, epigenetics has an important and fundamental role, as it is responsible for orchestrating gene expression. Epigenetic mechanisms can activate or repress genomic regions that could be expressed, as well as producing RNAs capable of destroying already formed peptides or interfering with the production of these peptides. In other words, the environmental condition that we provide to the individuals can modulate the way that their genome is expressed.

The different management practices that domestic animals receive is likely to be potentially affected epigenetically. The epigenetic mechanisms can modulate the gene expression in an adaptive way to this condition, with positive or negative outcomes. A recent study published by Pértille., *et al*. [1] showed the existence of at least three differentially methylated regions in the epigenome of broilers raised in different welfare conditions.

Initial research on the involvement of epigenetics and animal behavior was conducted using invertebrate animal models, such as fruit flies, worms, and bees. However, when accessing epigenetic information from complex individuals as mammals, that have been exposed to different environments, we are facing some challenges, especially caused by their greater generation interval. In this sense, to break this barrier and to start to develop better models and tools that can ensure standards of well-being epigenetically, more research is needed to compare different evolutionary processes in different species.

Epigenetics studies are about to invade the unknown territory and figure out new outcomes in biology. We are at the beginning of understanding the molecules that surround and modulate the genetic material of living beings. Shortly, our understanding possibly will achieve outcomes that we were not able to imagine until now.

Bibliography

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