
Talk

Transgenerational inheritance of environmental information in *Caenorhabditis elegans*



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ABSTRACT

Motivation: In 1906 Luther Burbank, an American botanist, said “Heridity is only the sum of all past environment” (Burbank, 1906). This idea has always been present in spite of being left behind after sustaining that the germline was isolated of the rest of the organism and, therefore, of the environment. With the rediscovery of epigenetics as a regulatory system which controls gene expression without affecting the composition of genes themselves, this idea has regained importance. Not only a great number of cases of environmental changes that influenced the epigenetics in a great variety of species began to be observed; but also the effects of these changes could last for three or more generations. This phenomenon was known as transgenerational epigenetic inheritance (Heard and Martienssen, 2014). This project aims to study the phenomenon of transgenerational epigenetic inheritance in the *Caenorhabditis elegans* model animal. The idea is to set the parameters where we can identify the phenomenon and reveal the molecular mechanism involved in the process.

Methods: We set two different experiments, resistance to pathogen and behavioral respond to the pathogen. For the resistance experiment, plates with *Escherichia coli* (OP50, main source of nematode's food) and plates with *Pseudomonas aeruginosa* (PA14, a pathogen) were used to grow mothers and then the percentage of descendants that reach adulthood were scored.

For the behavioral experiment, plates with OP50 and plates with both bacteria (PA14 and OP50) were used to grow mothers. Then their eggs were placed on plates containing OP50 and PA14. We counted the percent of worms that went to OP50 and to PA14.

Results: It has been observed that individuals whose mothers have been exposed to *Pseudomonas aeruginosa* are more resistant to it than those whose mothers have never been in contact with the pathogen. On the other hand, it has been observed that this inheritance not only affects the defense mechanisms of the organism, but also influences its behavior. At this time we are studying the genetic pathways involved in this process by using mutants affected in epigenetic and in other candidate pathways.

Conclusions: Our results suggest that there is not only an inheritance to stress resistance but also an acquired behavioral inheritance. Genes involved in epigenetic seem to be involved in the process.

REFERENCES

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