

Epigenetics mystery: Can environment-induced changes be passed on?

Israeli researchers have discovered that laboratory worms transfer information about their parents' physical environment through small RNA molecules that occur "independently of changes to the DNA sequence," explains Prof. Oded Rechavi, a neurobiologist studying worms and epigenetics at the Sagol School of Neuroscience at Tel Aviv University.

In a previous study, Rechavi found that worms can give their offspring a survival boost by transferring information concerning viral infection, nutrition and even brain activity.

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In the end, the researchers were able to delineate three laws that may explain who inherits epigenetic information – for worms today, maybe humans tomorrow.

First law: Inheritance is uniform in worms descending from the same mother.

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Second law: Inheritance is different in worms from different mothers, even though the mothers are supposedly identical. The researchers now understood that this is because the descendants randomly adopt different "internal states" that determine the duration of inheritance and thus the fate of subsequent generations.

Third law: The greater the number of generations in a specific lineage that inherits a trait, the greater the probability that it will continue on to the next generation as well.

"We hope that the mechanism we have discovered exists in other organisms as well, but we'll just have to be patient," Rechavi cautions.

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