

Rethinking the Genetic Theory of Inheritance

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Rethinking the Genetic Theory of Inheritance
January 18th, 2009 in Medicine & Health / Genetics
Scientists at the Centre for Addiction and Mental Health (CAMH) have detected evidence that DNA may not be the only carrier of heritable information; a secondary molecular mechanism called epigenetics may also account for some inherited traits and diseases. These findings challenge the fundamental principles of genetics and inheritance, and potentially provide a new insight into the primary causes of human diseases. Your mother's eyes, your father's height, your predisposition to disease—these are traits inherited from your parents. Traditionally, 'heritability' is estimated by comparing monozygotic (genetically identical) twins to dizygotic (genetically different) twins. A trait or disease is called heritable if monozygotic twins are more similar to each other than dizygotic twins. In molecular terms, heritability has traditionally been attributed to variations in the DNA sequence. [Video presentation available at the website <http://www.physorg.com/news151507849.html>] Dr. Art Petronis, head of the Krembil Family Epigenetics Laboratory at the Center for Addiction and Mental Health, discusses new evidence that DNA may not be the only carrier of heritable information; a secondary molecular mechanism called epigenetics may also account for some inherited traits and diseases. These findings challenge the fundamental principles of genetics and inheritance, and potentially provide a new insight into the primary causes of human diseases. Video: Center for Addiction and Mental Health

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CAMH's Dr. Art Petronis, head of the Krembil Family Epigenetics Laboratory, and his team conducted a comprehensive epigenetic analysis of 100 sets of monozygotic and dizygotic twins in the first study of its kind. Said Dr.

Petronis, "We investigated molecules that attach to DNA and regulate various gene activities. These DNA modifications are called epigenetic factors."

The CAMH study showed that epigenetic factors – acting independently from

DNA – were more similar in monozygotic twins than dizygotic twins.

This

finding suggests that there is a secondary molecular mechanism of heredity.

The epigenetic heritability may help explain currently unclear issues in

human disease, such as the presence of a disease in only one monozygotic

twin, the different susceptibility of males (e.g. to autism) and females

(e.g. to lupus), significant fluctuations in the course of a disease (e.g.

bipolar disorder, inflammatory bowel disease, multiple sclerosis), among

numerous others.

"Traditionally, it has been assumed that only the DNA sequence can account

for the capability of normal traits and diseases to be inherited,"

says Dr.

Petronis. "Over the last several decades, there has been an enormous effort

to identify specific DNA sequence changes predisposing people to psychiatric, neurodegenerative, malignant, metabolic, and autoimmune diseases, but with only moderate success. Our findings represent a new way

to look for the molecular cause of disease, and eventually may lead to

improved diagnostics and treatment."

An advance online publication of this study will be available on the Nature

Genetics website on January 18, 2009.

Source: Centre for Addiction and Mental Health

<http://www.physorg.com/news151507849.html>

Posted by

Robert Karl Stonjek

This is just another example of the epigenetic control of individual development,

of epigenetic inheritance, of epigenetic control of gene expression

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and the subordinate nature of genetic inheritance in relation to epigenetic inheritance. Numerous examples of the epigenetic control of individual development, evolution, speciation and other circumevolutionary phenomena can be found in my recent book *Epigenetic Principles of Evolution* or, more conveniently, in my website <http://www.nelsoncabej.com> (<http://www.epigeneticcomesofage.com>) How long could the neoDarwinian theory ignore the existence and the role of epigenetic inheritance in evolution? Is this not the time to any end to this ostrich attitude?

Nelson Cabej

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