Epigenetics: How environment impacts health of you, your child — and possibly their children as well

Suppose our genomes were sheet music, the DNA that makes each gene would be the notes. They get all of the attention and largely dictate how our genomes are “performed” by our cells. But if you’ve ever spent time looking at sheet music, you know there are other notations—symbols that tell how fast to play, in which key, and when to cut to the chorus. Epigenetic marks are like those extra notations. They ride along with the genes but aren’t part of them, and they govern how the DNA is packaged up, when and how it’s read, and which parts get skipped over.

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Conventional wisdom says epigenetic marks get wiped clean at conception when sperm and egg cells meet. But scientists have learned that these tags can be inherited and persist from parent to child and across many generations. Epigenetic marks triggered by trauma, such as famine or violence, can be found generations later in a family—where they continue to influence a person’s health.

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Epigenetic changes have been found in the adult children of Holocaust survivors; these changes influence how their bodies respond to stress, including the production of the stress hormone known as cortisol. A study of women who developed PTSD after 9/11 showed similar effects in their children, whose lower cortisol levels make them more vulnerable to PTSD.

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