‘Supersimilarity’: Identical twins are epigenetic twins as well

The sometimes-preternatural similarity of identical twins is more profound than previously thought. Identical twins, known to science as “monozygotic”, may share more than identical looks and genes, according to new research in the field of epigenetics.

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The team zeroed in on a class of epigenetic markers that are stable and exist in all cell types, called “metastable epialleles” (MEs). The epigenetic variation at MEs is determined randomly and is influenced by many environmental factors, ranging from the nutritional breakdown of the mother’s diet to the season. Consequently, it was expected that levels of epigenetic similarities and differences for MEs would be similar for both identical and fraternal, or non-identical, twins.

What they found was something of a shock.

Their research, published in *Genome Biology*, shows that monozygotic twins have identical epigenetics at MEs. “We found that the methylation patterns matched almost perfectly in identical twins, a degree of similarity that could not be explained by the twins sharing the same DNA,” says [researcher Robert Waterland]. “We call this phenomenon ‘epigenetic supersimilarity.’”

The striking finding had a simple explanation: “If, in this group of genes, the epigenetic markers are established before the embryo splits into two, then the markers will be the same in both twins,” says Waterland.

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[T]he scientists have also detected a link between methylated MEs and the risk of developing certain types of cancer.

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