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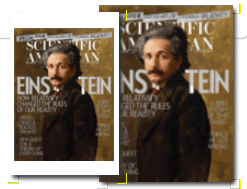
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A Road Map to the "Volume Control" of Genes

Genes, traits and disease are linked in complex and surprising ways

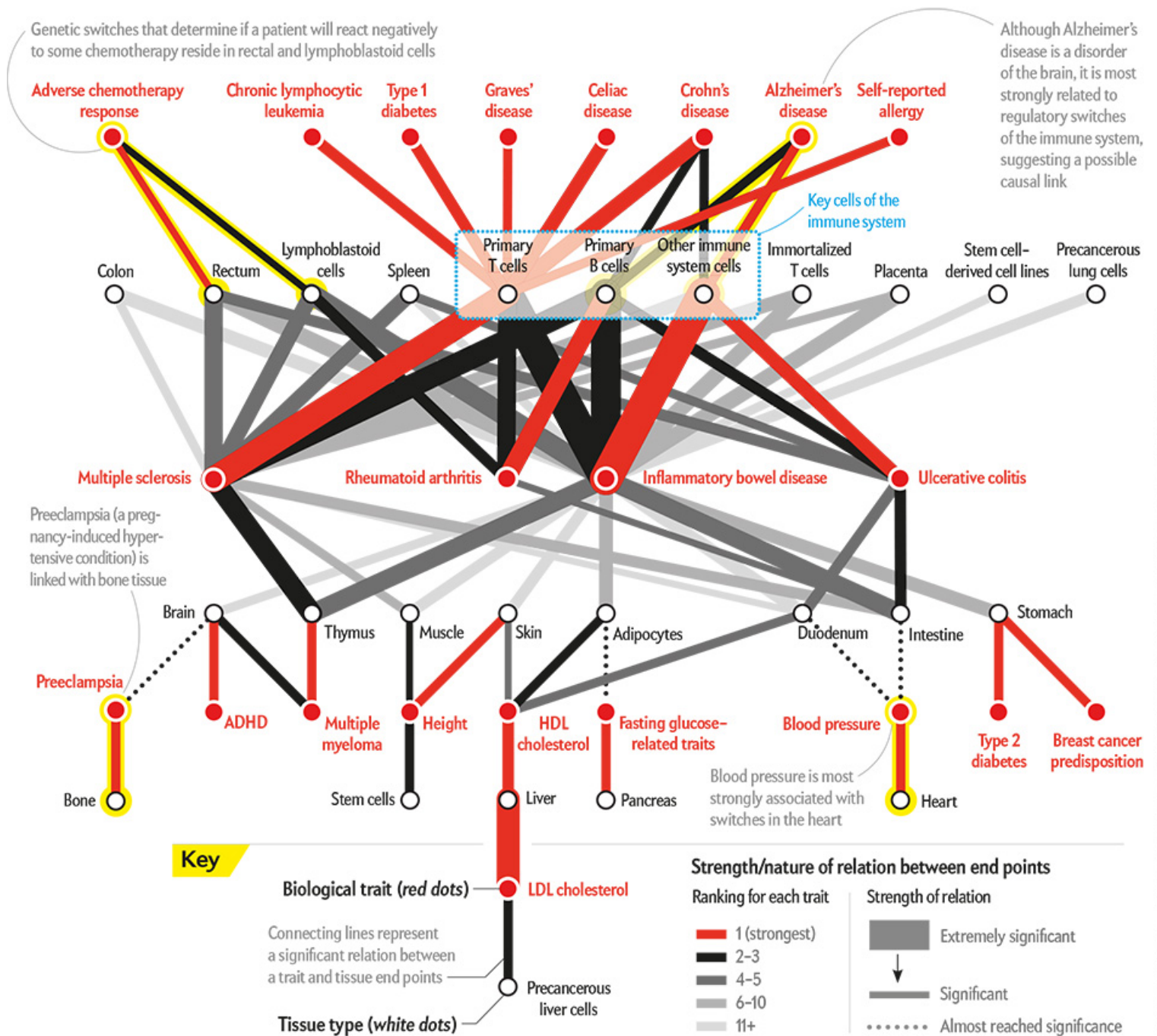
By [Dina Fine Maron](#) | May 19, 2015

Our genes are not the last word on disease risk or other traits. Myriad control switches help to arbitrate how genes get expressed in different cells and tissues, and those switches are often triggered by maternal diet, toxic exposures and many other environmental factors. To begin to understand what drives these complex epigenetic effects, scientists analyzed 150 billion bits of genomic data from more than 100 human tissues and cells—brain, heart, bone, and so forth.

The first step was to locate the switches by analyzing specific chemical modifications on the DNA and the proteins that it wraps around. Then researchers took data comparing individuals who have specific biological traits with those who do not to see which traits are associated with which switches. The result is an epigenomic road map that links diseases and traits (*red dots*) with the locations in the body (*white dots*) of the switches most correlated with those features; thicker lines correspond to more robust links. This blueprint should come in handy in sussing out the molecular basis of human variation and disease and in discovering potential new treatments.

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SOURCE: "INTEGRATIVE ANALYSIS OF 111 REFERENCE HUMAN EPIGENOMES," BY ROADMAP EPIGENOMICS CONSORTIUM ET AL., IN NATURE, VOL. 518, FEBRUARY 19, 2015

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