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Tuesday, Dec. 08, 2009

## The Human Epigenome, Decoded

By Eben Harrell

The decoding of the human genome nearly a decade ago fueled expectations that an understanding of all human hereditary influences was within sight. But the connections between genes and, say, disease turned out to be far more complicated than imagined. What has since emerged is a new frontier in the study of genetic signaling known as epigenetics, which holds that the behavior of genes can be modified by environmental influences and that those changes can be passed down through generations. So people who smoke cigarettes in their youth, for example, sustain certain epigenetic changes, which may then increase the risk that their children's children will reach puberty early. In October, a team led by Joseph Ecker at the Salk Institute in La Jolla, Calif., studied human skin and stem cells to produce the first detailed map of the human epigenome. By comparing this with the epigenomes of diseased cells, scientists will be able to work out how glitches in the epigenome may lead to cancers and other diseases. The study, which was published in the journal *Nature*, is a giant leap in geneticists' quest to better understand the strange witches' brew of nature and nurture that makes us who we are.

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