Interaction between epigenetics and genetics

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There have been two opposing viewpoints here on S.B.E. recently. One view is that genes and the environment interact with each other and therefore it is erroneous to state either the environment or DNA is dominant in producing and shaping phenotypes. The other view while acknowledging the interaction between genes and the environment takes the position DNA ultimately has more influence on phenotype. It would seem these two positions are irreconciliable with each other. My own view is supportive of both positions. Upon recently reading an article on epigenetics [included below] I was struck by the complicated interaction between the environment and DNA. It certainly seemed to put a dent in the idea DNA ultimately has more influence on phenotype. The consensus of the piece was that epigenetics didn't replace Mendelian genetics but rather the two went hand in hand.

Rather than primarily focusing on epigenetics in humans, however, the article focused on agouti mice and Drosophilia Melanogastor physical phenotypes. In agouti mice DNA methylation pattern which produced different color coats and in heat shock protein Hsp90 appendages protruding from the eyes of flies.

In the case of humans the Dutch hunger winter during WWII was cited. The article states, "Detailed birth records collected during that so−called Dutch Hunger Winter have provided scientists with useful data for analyzing the long−term health effects of prenatal exposure to famine. Not only have researchers linked such exposure to a range of developmental and adult disorders, including low birth weight, diabetes, obesity, coronary heart disease, breast and other cancers, but at least one group has also associated exposure with the birth of smaller−than−normal grandchildren." Needless to say, I don't think it is a surprise severe environmental trauma on a developing embryo/fetus will result in genetic deficits and damage.

The article also mentions the importance of epigenetics of the epidimeology of disease, particularly cancer and negative epigenetic changes as a result of assisted reproductive technology and how epigenetic changes present obstacles to human cloning.

According to Vercelli, the environmental susceptibility of epigenetics probably explains why genetically identical organisms such as twins can have dramatically different phenotypes in different environments. This is based on variability in CpG methylation at the agouti locus causes differences in coat color among genetically identical mice. Maternal nutrition affects the phenotype of offspring by influencing the degree of CpG methylation at