1 Reading assignment 11. Epigenetics

Answer the following:

1. What is the epigenome?

   A structure that covers both the DNA and histones with chemical tags. It shapes them the physical structure of the genome, and tightly wraps inactive genes, making them unreadable.

2. What is methylation and why is it important for epigenetics?

   A biochemical pathway that extracts methyl groups from the nutrients in the food eaten and then attaches them to our DNA. Diets high in these methyl-donating nutrients can rapidly alter gene expression, especially during early development when the epigenome is first being established.

3. Describe one effect of nutrition on the epigenome.

   All mammals have a gene called agouti. When a mouse's agouti gene is completely unmethylated, its coat is yellow and it is obese and prone diabetes and cancer. When the agouti gene is methylated (as it is in normal mice), the coat color is brown and the mouse has a low disease risk.

4. Are epigenetic patterns reversible? Provide an example.

   Yes. For adults a methyl-deficient diet leads to a decrease in DNA methylation, but the changes are reversible when methyl is added back to diet.

Source: `https://learn.genetics.utah.edu/content/epigenetics/`