

Epigenetics and Health

In-Class Activity

Recent research has shown that while the DNA we inherit is permanent throughout our lives, epigenetics is far more flexible and in fact blurs the lines between Nature and Nurture. As a biological psychologist, you need to present new findings to potential parents (they haven't had their first child yet, but are in the planning stages), and explain why their own lifetime health habits are so important to the health of their future children. You will also show why it is becoming harder and harder to distinguish between nature and nurture. You will work in a group of no more than 3-4 students to discuss and answer the following question. Each group will submit a report at the end of the class (only 1 person needs to submit per group). Please make sure to include each group member's FULL name and student number.

In order to address the following questions, you will need the following material:

- Your class notes/textbook
- The video "Epigenetics" (found on Lea)
- The article "Dad's life experiences may epigenetically influence his children's health" (found on Lea)

1. Explain what is meant by the nature vs. nurture issue, providing examples of each
2. Explain what is meant by Epigenetics. Explain how epigenetics is involved in the expression of DNA by explaining the roles of histones, methyl groups, and acetyl groups.
3. Explain how life experiences such as stress, nutrition (or malnutrition), exercise, etc. may alter a person's own genetic expression. At what point in a person's life might these changes in genetic expression occur? Explain your answer.
4. Citing the findings of the study conducted in Sweden on the intergeneration effects of nutrition (explained in the video), explain how environmental factors like famine vs. plenty may influence not only the current generation but also future generations. How do epigeneticists explain these findings?
5. Using evidence from the video as well as the provided article, explain why it is important for future fathers, as well as mothers, to have a healthy lifestyle, for example, avoiding over-consumption of alcohol, drugs, extreme stress etc? What are the potential consequences of both future mothers' AND fathers' lifestyle choices on the health of their future children?
6. Based on the discussion of the questions above, how does this change our understanding of the Nature vs. Nurture issue.