

CLASSROOM ACTIVITY

Genes and Health: Moving Beyond Race

Many diseases have both genetic and environmental causes. Scientists often take traditional racial boundaries into account when researching why certain populations seem predisposed to certain diseases. But work on asthma at the University of California—San Francisco is going beyond current concepts of race to consider human genetic variation—how our species has diversified in the past 150,000 years—to hone in on inherited components that may play a role in disease prevalence.

CLASS DISCUSSION

Establish Prior Knowledge

Discuss with students the roles genetics and environment play in many diseases. Use the following questions to generate a discussion.

- What environmental conditions might play a role in a person’s tendency to contract a disease? *(Answers may vary and could include: air pollution, water pollution, pesticides, chemicals, and radiation.)*
- Genetics too can play a role in a person’s tendency to contract a certain disease. What are some of the diseases that can be inherited--caused by certain genes? *(Answers may vary and could include: Asthma, cardio-vascular disease, diabetes, and certain types of cancer.)*

As scientists study what genes are responsible for certain kinds of diseases, they often look at race. Some races seem more prone to develop a certain disease than other races. Tell students that in the video they are about to see, scientists in California are going beyond race to study people’s ancestral backgrounds to better understand the genetic basis of some diseases.

Exploration

Have students watch the video and take notes. Use the following questions to guide a class discussion.

- What disease are these scientists studying? *(Answer: Asthma and its prevalence among a number of racial groups including Mexican-Americans, African Americans, Caucasians, and Puerto Ricans.)*
- What is the hypothesis that the scientists hope to support? *(Answer: The difference in asthma prevalence and severity is due to genetic differences and that ancestry may help to explain the differences.)*
- What causes human genetic variation? *(Answer: Human genetic variation is the result of groups living isolated from each other for a very long time. They have had to adapt to different environments. The groups--Asians, Europeans, and Africans-- have different genetic characteristics.)*
- How do the scientists determine ancestry? *(Answer: Scientists trace a person’s ancestry through his or her DNA.)*
- In terms of asthma, what can scientists determine when they compare ancestral patterns? *(Answer: They can see whether there is a difference in the ancestral patterns between people with asthma and people who don’t have asthma.)*

Wrap-Up

How might these scientists’ findings be used in the future?

(Answers will vary and may include: An individual’s DNA can be tested to determine his or her risk factor for asthma. Scientists will know where to look for the gene that is responsible for asthma.)