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## Human Variation Quiz: Are we more similar than different?

Test your understanding of human variation as it relates to the concept of race by answering the following 10 questions. Circle your initial response to each question. After you have an answer for each go to the website and see how you did. Jot down any pertinent notes revealed in the answer.

<http://www.understandingrace.org/humvar/quiz.html>

What does skin color tell you about a person?

- a. It indicates his or her race
- b. It provides information about his or her cultural heritage.
- c. It offers insight into his or her predisposition to disease
- d. None of the above

Skin color alone does not provide any reliable information about a person's race, culture or susceptibility to disease. Race is a cultural invention based on a set of ideas developed in recent history and science. However, skin color may offer insights into a person's geographic ancestry. Scientists theorize that skin color evolved as an adaptive trait linked to the strength of the sun's ultraviolet rays.

2. The origins of modern humans can be traced back to Africa by studying DNA.
- a. True
  - b. False
  - c. Not sure

Human DNA and specific alleles can be traced back to an African population that existed over 100,000 years ago. One way that scientists can trace our genetic ancestry is by following the path of mitochondrial DNA and Y-chromosome DNA, which are normally transmitted unchanged from one generation to the next.

3. The actual patterns of DNA variation in humans show that African populations contain:
- a. Nearly all of the common DNA variants found in Asians and Europeans, plus novel variants that are not found in either Europeans or Asians.
  - b. None of the DNA variants found in Asians and Europeans.
  - c. Only a few of the variants found in Asians and Europeans.

Actual patterns of DNA variation in humans show that nearly all the genetic variants found in Asians and Europeans are also found in Africans. However, Africans also possess many novel variants not present in Asian and European

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populations. As early populations began migrating out of Africa toward Asia and Europe, they took only a portion of Africa's genetic variation with them. Much additional variation remained in Africa.

4. Which of the following are influenced by both environmental and genetic factors?
- a. Skin color
  - b. Height
  - c. Disease
  - d. All of these

Genes and environments work together to make each person unique. Characteristics such as skin color, height and susceptibility to disease are determined by complex combinations of genetic traits, environmental factors and cultural experiences.

5. Can scientists determine a person's race by looking at his or her DNA?
- a. Yes
  - b. No
  - c. Not sure

There is no gene for "race." There are no qualitative genetic differences between perceived races. However, it is possible to trace geographic ancestry using DNA. Since humans expanded out of Africa, genes have changed in small ways in every part of the world. Each of these small changes is a marker for a person's ancestors who lived where the changes occurred. To a geneticist, these changes are like mileposts along a path, leading first to the people in a local place and then back to the African source. Each genetic change tells only a small piece of the story about human history. A scientist must look at many pieces of DNA to get a reliable story.

6. Which sentence is true?
- a. Sickle cell disease causes dark skin color.
  - b. The sickle cell trait became prevalent in Africa and a few other parts of the world where malaria is common because the trait offers resistance to malaria.
  - c. Sickle cell is a disease that is found only in people of African ancestry.

The sickle cell trait became prevalent in Africa and a few other parts of the world where malaria is common because the trait offers resistance to malaria. The sickle cell trait is found more frequently in persons of Middle Eastern, Indian, Mediterranean and African heritage because those

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geographic regions are most prone to malaria. The gene variant for sickle cell disease is related to malaria, not skin color.

7. Experiencing racism can lead to serious health consequences that affect the distribution and concentration of disease in populations.
- True
  - False
  - Not sure

The experience of racism is a stressor that can affect physiology and therefore disease. Numerous studies have correlated racial discrimination with mental distress and increased cardiovascular response (CVR). Other stressors, such as occupational stress or age discrimination, can also affect physiology and result in disease.

8. Skin color evolved as the body's way of adapting to:
- Race
  - Ultraviolet radiation from the sun
  - Climate

Skin color evolved as the body's way of adapting to ultraviolet radiation (UVR) from the sun. UVR helps the human body use vitamin D to absorb the calcium necessary for strong bones, but too much UVR strips away folate (folic acid), another essential nutrient. Skin pigmentation developed as the body's way of balancing its need for vitamin D and folate.

9. The ultimate source of all human genetic variation is:
- Mutations in the DNA
  - Natural selection
  - Geography
  - Race

Genetic mutations are the ultimate source of all human genetic variation and are caused by random copying changes in base pairs that occur during replication. However, natural selection and geography are forces that affect the types of genetic mutations that occur. Humans are more genetically similar than different.

10. Is race in humans an accurate picture of genetic diversity?
- Yes
  - No
  - Not sure

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The concept of race does not provide an accurate view of human genetic diversity. The actual patterns of genetic diversity as observed from analyses of human DNA and the genome do not correspond to the concept of "race" as it is understood in the United States.

Racial groupings based on visible physical traits, such as skin color, nose shape or hair texture, tend to be arbitrary distinctions, as traits do not aggregate into categories that can be described as races. History has shown that perceptions of race change over time. Further, people culturally self-identify differently than others would categorize them.