The Making of the Fittest: Natural Selection in Humans



NA	ME	DATE
1.	For the statement: "Sickle cell disease is a(n) disease." Which of the following terms could fill in the blank to make the statement true? Write 'yes' or 'no' next to each possible response. There may be more than one correct answer.	
	genetic infectious	
	lethal inherited	
2.	For the statement: "Malaria is a(n) disease." Which of the following terms could fill in the blank to make the statement true? Write 'yes' or 'no' next to each possible response. There may be more than one correct answer.	
	genetic infectious	
	lethal inherited	
3.	For the statement: "An individual with two normal copies of the hemoglobin gene is said to be" Which of the following terms could fill in the blank to make the statement true? Write 'yes' or 'no' next to each possible response. There may be more than one correct answer. (Note that a 'locus' is a location on a chromosome.)	
	homozygous at the hemoglobin locus susceptible to malaria	
	heterozygous at the hemoglobin locus an identical twin	
4.	At the beginning of the film, you were introduced to Davaun and Skyy Cooper, who both have sickle cell diseas Which of the following must be true about their parents?	se.

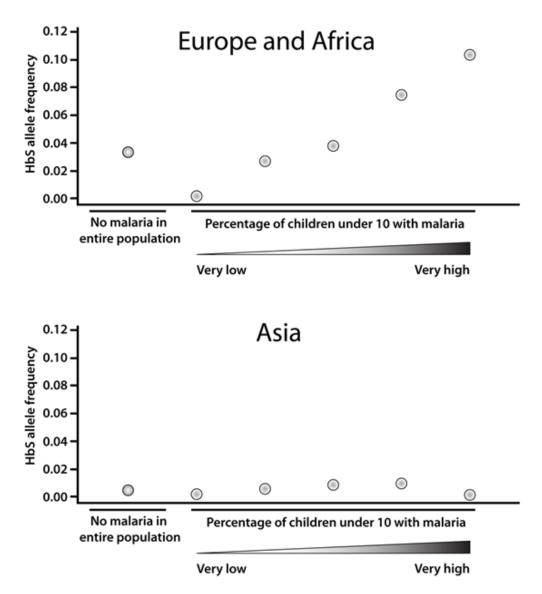
a. One parent has at least one copy of the sickle cell allele.b. Both parents have at least one copy of the sickle cell allele.

c. Both parents have sickle cell disease.d. One parent has sickle cell disease.

5.	In three to five sentences, explain why sickle cell disease became so prevalent in certain East African populations.
6.	There are now several effective antimalarial drugs that can treat people who have malaria or prevent them from getting the disease altogether. Predict what will happen to the frequency of the sickle cell allele as these drugs become more widely used. Support your answer with at least one piece of evidence from the film.
7.	If sickle cell disease was caused by only one copy of the sickle cell allele, do you expect the frequency of the sickle cell allele to increase, decrease, or remain the same in places where there is a high incidence of malaria? Explain your answer in two or three sentences.
8.	Due to climate change, the range of malaria is expected to spread to areas where it was previously not a problem. Given this piece of evidence, predict what will happen to the frequency of the sickle cell allele in areas where malaria is introduced.

9.	Is the following statement true or false? "Malaria caused the sickle cell allele to appear." Justify your answer in one or
	two sentences.

10. Recently, Frédéric Piel *et al.* looked at global distributions of malaria infection and compared it to the global distribution of the sickle cell (HbS) allele. In one study, they looked at the frequency of the HbS allele in two different geographical areas: Europe and Africa, and Asia. Their findings are in the graphs below:



a. Summarize the data presented in the graphs in two or three sentences.

b. Provide a hypothesis that explains the author's findings in the second graph.