金沢医大　2013年

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次の英文を読み，問いに答えなさい。

If you handed me four DNA samples, and said one came from a person who lived in Japan, another from Spain, another from Nigeria, and a fourth from a Native American living in Arizona, I could go to the laboratory, spend a little time doing DNA analysis, and almost certainly tell you which was which. But my success would depend upon the fact that each of those individuals had ancestors who had lived in those areas for some time, so that their DNA reflected the features of those founders.

If, on the other hand, you gave me a DNA sample from the golfer Tiger Woods, I would have 8 time. By his own description, Woods is one-quarter Chinese, one-quarter Thai, one-quarter African-American, one-eighth Native American, and one-eighth Dutch. Nevertheless, by testing a sufficient number of DNA variations that are known to have somewhat different frequencies across the world, I could probably make a reasonable guess about his mixed ancestors.

In some instances, however, the commercial business of testing for ancestors has gotten a little ahead of the science. Some testing services even claim to be able to tell African-American individuals from which African village their original slave ancestors came. That could be correct only if relatively little movement had occurred within Africa 9 during the past few thousand years. Such precise conclusions would also require very comprehensive DNA sampling across all the villages of Africa, which is not yet available.

As the ability of DNA analysis to predict ancestors has become more 10 , this approach has begun to find its way into forensics\* in new and complicated ways. Recently, police officers in Louisiana were on the trail of a serial killer, from whom (ア)they had derived a DNA sample from a bit of material left at the scene of the crime. Eyewitnesses disagreed about the physical features of the suspect, some reporting that he was black whereas others said he was white. 【 ① 】 Using a psychological profile developed by the FBI, the authorities focused on searching for a white male aged 25 to 35. 【 ② 】 But a company that identifies DNA was called in. 【 ③ 】 It analyzed the sample and said the suspect was 85 percent sub-Saharan African and 15 percent Native American, and would be expected to be dark-skinned. 【 ④ 】 Eventually a black male was caught, and his DNA was found to match that collected at the crime scene. 【 ⑤ 】 After a court trial, he was found guilty of murder, and he is now serving a life sentence.

Some would say that this was a valuable support to police work, since it led to an arrest and a conviction\*. However, 11 our inability to make precise predictions, one could also imagine an alternative situation in which such information could throw the police off the track and lead to arresting innocent parties.

This kind of “DNA profiling\*” is likely to become more and more common as time goes on. Scientists are now in the process of identifying DNA variations that play a role in facial features, hair quality, and adult height. Might it be possible in the future that the police graphic artists will depend as much on the DNA sample as on the description of eyewitnesses?

注\*：forensics (警察の)科学搜査；conviction 有罪判決；profiling プロファイリング，プロフィール分析

(1) 文章中の 8 ～ 11 に入る最も適切な語句を，それぞれ①～⑤から1つ選びなさい。

8

① an easier ② a more difficult ③ hardly any

④ spent a fewer ⑤ spent less

9

① itself ② himself ③ themselves ④ within

⑤ before

10

① curable ② critical ③ ready ④ ultimate

⑤ accurate

11

① considered ② counting ③ given ④ reminding

⑤ to regard

(2) 下線部(ア)theyが指しているものを，①～⑦から1つ選びなさい。

① DNA analysis ② ancestors ③ forensics

④ new and complicated ways ⑤ police officers ⑥ serial killers

⑦ eyewitnesses

(3) 次の文が入る最も適切な箇所を，文章中の【 ① 】～【 ⑤ 】から1つ選びなさい。

The police work then shifted to a different list of suspects.

(4) 本文の内容と合う英文を，①～⑦から2つ選びなさい。

① The author of this passage is most likely a physician from Arizona, a state where DNA profiling is commonly used.

② Tiger Woods found out that he was 25% African-American, 25% Thai and 50% Chinese with the help of DNA sampling.

③ The author thinks he can identify if a man is from Spain or from Japan if his ancestors had lived in the same area for some time.

④ Nowadays, people in private businesses have much more advanced DNA profiling techniques than university professors.

⑤ DNA sampling carried out across all the villages of Africa has helped people identify their ancestors more easily than before.

⑥ In a serial killer case, eyewitnesses at first did not agree to use DNA sampling because they thought it was not reliable enough.

⑦ Currently, the police are relying more on eyewitness descriptions of suspects than DNA but there is a chance that it may change in the future.

(5) 本文のタイトルとして最も適切なものを，①～⑤から1つ選びなさい。

① A DNA sample uncovers mysteries of rare diseases

② The police and DNA profiling ―― the future of investigation methods

③ How can we turn DNA profiling into a successful business?

④ DNA can make predictions about ancestors and criminals

⑤ New discoveries on DNA may change the world