1 Pre-reading questions

There are countless books, serials and films that deal with criminal investigation and forensic science. Have you ever read or seen any?
Do you think the protagonists base their investigation on real techniques?
Do you like this type of fiction? Why/why not?

Biotechnology and forensics

Forensics, short for forensic science, is the application of science in a legal setting. Biotechnology is used by forensic scientists to collect or process trace evidence such as hair, skin, blood or semen samples, which is found at crime scenes.

An important aspect of modern forensics is the use of DNA profiling, or genetic fingerprinting. Sources of DNA include blood, hair, semen, saliva, bone and tissue.

Every person has a unique DNA profile. The only exception to this is monozygotic twins. The chemical structure of everyone's DNA is the same. The only difference between people (or any animal) is the order of the base pairs. There are so many millions of base pairs in each person's DNA that every person has a different sequence.

Using these sequences, every person could be identified solely by the sequence of their base pairs. However, because there are so many millions of base pairs, the task would be very time-consuming. Instead, scientists are able to use a shorter method, because of repeating patterns in DNA. To identify individuals, forensic scientists scan 13 DNA regions, or loci, that vary from person to person and use the data to create a DNA profile of that individual (called a DNA fingerprint). There is an extremely small chance that another person has the same DNA profile for a particular set of 13 regions.

With the help of a technique that amplifies DNA, the PCR (Polymerase Chain Reaction), which is used to make millions of exact copies of DNA from a biological sample, it is possible to determine DNA fingerprinting even analyzing a very small quantity of DNA. The technique of DNA fingerprinting is based on the analysis of two types of highly variable sequences present in human genome: VNTR (Variable Number Tandem Repeats) and STR (Short Tandem Repeats). By combining the information obtained from the analysis of more VNTR or STR regions it is possible to obtain the distinctive profile of a person.

These patterns do not, however, give an individual "fingerprint," but they are able to determine whether two DNA samples are from the same person, related people, or non-related people.

The results from DNA profiles may be used in court. For example, the samples collected from a crime scene might match the DNA of a suspect. This could be used as evidence that the suspect had been present at the crime scene – but it does not necessarily prove that the suspect committed the crime.

DNA evidence is rarely the only basis of a prosecution case. It is most useful when placed alongside other evidence, such as fingerprints, footprints, crime scene examination and eyewitness accounts. Other biological evidence may also be collected, for example blood splash patterns (showing the direction of the injury) and microbial information (which may give clues as to the time of death).

2 While reading find the English equivalent of the following words.

1. Prova
2. Solamente
3. Che porta via tempo
4. Esaminano
5. Campioni
6. Caso giudiziario
7. Impronte digitali
8. Testimone oculare

3 Answer the following questions

1. Give a definition of forensics.
2. Which are DNA sources ?
3. Who has an identical DNA?
4. What is different in the DNA structure of different individuals?
5. What do scientists do to identify individuals?
6. What technique do they use?
7. Give a definition of PCR using your own words.
8. How can forensic analysis be used in court?

New studies show dangers of GM foods

Jeffrey Smith, of the Institute for Responsible Technology, has been a strong advocate of banning GM foods, and has grave concerns about the widespread use of GM foods in the US food chain. GM foods have been approved by the Obama Administration at an unprecedented level. However, there are no long-term safety studies of GM food impact on public health.

Smith recently noted two studies, one in Canada that deals with higher risk of miscarriages in children related to GM foods, and one in Italy.

The Italian study is interesting: it found that mice on a diet of genetically modified foods common in today's food markets developed a wide range of allergies compared with the control group. Specifically, the mice had "an increase in cytokines." These are chemicals that govern allergic response. The mice also had increases in "T-cells" associated with arthritis and connective tissue diseases (Institute for Responsible Technology).

Imagine: 85% of all corn in the US is genetically modified to be resistant to pesticides. So when we're eating those corn chips, is there any direct impact on us?

Smith notes a study in the above link where the genetic material that creates pesticide resistance, when digested by humans, tends to be found in trace amounts in humans and may have serious health impacts. It appears that we may be poisoning ourselves.

The only way to avoid GM foods in the US is to buy food that is labeled USDA organic.

Adapted from :*www.examiner.com*

1 Answer the following questions

1. Why is Jeffrey Smith worried about the widespread use of GM foods?
2. What are the results of the Italian study?
3. What happened to the mice?
4. What type of GM corn is common in America?
5. What may happen when we eat it?
6. Do you think Jeffrey Smith is right in worrying about long-term consequences of GM foods?