GREEN GRAEC IGBOGI

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PHARMACOLOGY

PHA 210 ASSIGNMENT

QUESTION

Explain the applications of DNA fingerprinting in medical biotechnology

In criminal investigations, the DNA fingerprint of a suspect's blood or other body material is compared to that of the evidence from the crime scene to see how closely they match. The technique can also be used to establish paternity. First developed in 1984 by Alec Jeffreys, a British professor of genetics at the Univ. of Leicester, DNA fingerprinting has been accepted in most courts in the United States, and has in several notable instances been used to exonerate or free persons convicted of crimes, but the Supreme Court has ruled (2009) that convicted criminals do not have a constitutional right to DNA testing. All states have established DNA fingerprint databases and require the collection of DNA from convicted felons, and the Federal Bureau of Investigation has instituted a national DNA fingerprint database linking those of the states and including DNA collected in connection with federal offenses. DNA fingerprinting is generally regarded as a reliable forensic tool when properly done, but some scientists have called for wider sampling of human DNA to insure that the segments analysed are indeed highly variable for all ethnic and racial groups. It is possible to create false genetic samples and use them to misdirect forensic investigators, but if those samples have been produced using gene amplification techniques they can be distinguished from normal DNA evidence.

The techniques used in DNA fingerprinting also have applications in paleontology, archaeology, various fields of biology, and medical diagnostics. It has, for example, been used to match the goatskin fragments of the Dead Sea Scrolls. In biological [classification](https://www.infoplease.com/encyclopedia/science/biology/concepts/classification), it can help to show evolutionary change and relationships on the molecular level, and it has the advantage of being able to be used even when only very small samples, such as tiny pieces of preserved tissue from extinct animals, are available.

 Practical Applications of DNA Fingerprinting

1. Paternity and Maternity
Because a person inherits his or her VNTRs from his or her parents, VNTR patterns can be used to establish paternity and maternity. The patterns are so specific that a parental VNTR pattern can be reconstructed even if only the children's VNTR patterns are known (the more children produced, the more reliable the reconstruction). Parent-child VNTR pattern analysis has been used to solve standard father-identification cases as well as more complicated cases of confirming legal nationality and, in instances of adoption, biological parenthood.

2. Criminal Identification and Forensics
DNA isolated from blood, hair, skin cells, or other genetic evidence left at the scene of a crime can be compared, through VNTR patterns, with the DNA of a criminal suspect to determine guilt or innocence. VNTR patterns are also useful in establishing the identity of a homicide victim, either from DNA found as evidence or from the body itself.

3. Personal Identification
The notion of using DNA fingerprints as a sort of genetic bar code to identify individuals has been discussed, but this is not likely to happen anytime in the foreseeable future. The technology required to isolate, keep on file, and then analyze millions of very specified VNTR patterns is both expensive and impractical. Social security numbers, picture ID, and other more mundane methods are much more likely to remain the prevalent ways to establish personal identification.

4.Show who your parents, siblings, and other relatives may be.

5. Identify a dead body that’s too old or damaged to be recognizable.

6. Establish paternity and parentage

7. Study biodiversity of species

8. Track genetically modified crops

9. Match tissues of organ donors with those of people who need transplants.

10. Identify diseases that are passed down through your family.

11. Help find cures for those diseases, called hereditary conditions.