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Pharmacology

PHA210 DNA fingerprinting

The **DNA fingerprint** can be revealed by processing cells collected from individuals through one of several different techniques. These different techniques for genetic **fingerprinting** have been applied to identify and isolate disease genes, develop cures for diseased genes, and diagnose genetic diseases

Some applications may include :

Paternity Testing

Testing paternity samples requires the collection of cells and comparison of DNA fingerprints from and between children and potential parents. Children will have a mix of DNA fingerprints inherited from each parent. When a child is conceived, each parent provides half of the genetic information. Most often the test is performed when the mother of the child is known but the father is in question. Since it is highly unlikely that any two people will have the same genetic fingerprint, paternity

testing using DNA fingerprints is a reliable way to determine the parentage of a child.

Genetic Forensics

A crime scene can contain biological samples, including blood, semen, saliva, skin, urine and hair, from perpetrators, victims and bystanders that can be processed to provide DNA fingerprints. The DNA fingerprints obtained are used to search existing databases for matches and to identify victims or suspects. The biological evidence and the DNA fingerprints can be used in trials to help prove guilt or innocence. The United States military has been storing DNA fingerprints of all military personnel for identification of casualties and those missing in action. The military has found the technology to be superior to identification methods used previously.

Plants and Animals

DNA fingerprinting of plants and animals is performed for food security, food safety, identification and parentage. In food animals, DNA fingerprinting can be used to trace meat to the source animal. The technique can

be used to identify endangered and non-endangered fish species, while the sources of plants can be verified to prevent counterfeiting of seeds and stock. Pathogenic food organisms can be quickly identified by their DNA fingerprints, allowing doctors to provide timely, targeted treatment.

Identity Testing

Penta E has become part of the common sequence of data variables for human identity testing. Promega's current system, the PowerPlex kit, is preferred in genetic testing laboratories for paternity testing. These commercial STR kits identify sixteen core loci through a color detection system. Penta E is easily identifiable because it is labeled with fluorescein.

DNA Genetic Ancestry

STR testing is widely used in anthropological research of populations, civilizations, ethnicities and geography. Individuals can trace their ancestry through DNA Tribes Genetic Ancestry Analysis. This service uses genetic material from paternal and maternal ancestors to measure connections to ethnic groups and world regions. The individual's results are compared to locations matching his or

her blend of ancestry.