DNA Sequencing

by Sophia

WHAT'S COVERED

In this lesson, you will learn to understand how DNA is mapped and understood. Specifically, this lesson will cover:

1. DNA Sequencing

DNA sequencing provides a lot of information about genes, like where a gene is located on a chromosome. It can tell us about the order of nucleotides involved in a gene, how a gene functions, about mutations of a gene, and how genes interact with other genes. This can be really beneficial in the medical world because, if the way genes work is understood, information about certain types of genetic disorders can be gained.

It's also useful in the study of **genomics**. A **genome** is all of the DNA in a species' entire set of chromosomes. A **variable number tandem repeat** is a region of DNA that varies from person to person.

↱ EXAMPLE Within a species, a certain percentage of their DNA will be the same. More than 99% of all human DNA is the same. It is the less than 1% that is the variable number tandem repeat.

Of all the variable number tandem repeats, you have a unique combo of repeats. This unique combination of repeats of nucleotides is like your genetic fingerprint. This is what is used in forensics if people are doing blood tests or DNA tests.

TERMS TO KNOW

DNA Sequencing

A genetic technology that allows us to characterize and leverage genes.

Genomics

The study of genomes.

Genome

All of the DNA in an individual's complete set of chromosomes.

Variable Number Tandem Repeats

The portion of DNA (about 1%) that is unique to each individual.

2. The Human Genome Project

The **Human Genome Project** was a project that mapped the complete human genome using DNA sequencing. This was a huge project because there are over three billion nucleotide bases in a total of about 21,500 genes. The knowledge of this information is very helpful in the research of genetic disorders and medicine.

The 21,500 genes mentioned above code for all the proteins we make. However, if you add all the nucleotides from all those gene sequences together, nucleotides that code for genes only make up 2% of all the nucleotides in our genome. The rest of the DNA is noncoding DNA. Historically, the noncoding DNA has been referred to as "junk DNA" because it doesn't code for proteins. However, we are beginning to discover that it has subtler functions, such as modulating the timing and location of protein expression. Biologists are working on trying to figure out what the purpose of this junk DNA is.

TERM TO KNOW

Human Genome Project
A complete map of the entire human genome completed with DNA sequencing.

SUMMARY

DNA sequencing has been very useful in the medical field, and it has provided us with a lot of information about how genes function, where they're located, and how they interact with other genes. **The Human Genome Project** mapped the complete human genome using DNA sequencing.

Keep up the learning and have a great day!

Source: This work is adapted from Sophia Author Amanda Soderlind

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