

Genome

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Genome Latest News

Researchers recently sequenced the first whole ancient Egyptian genome from an individual who lived 4,500 to 4,800 years ago — the oldest DNA sample from Egypt to date.

About Genome

- A genome is an **organism's complete set of genetic information**.
- A genome includes all of the hereditary **instructions for creating and maintaining life**, as well as **instructions for reproduction**.
- The **human genome**, like all other cellular life forms, **consists of DNA** (deoxyribonucleic acid) and **includes both the nuclear and mitochondrial DNA**. This is in **contrast to** ribonucleic acid (**RNA**) **viruses, whose genome is composed of RNA**.
- **From Genome to Genes:**
 - The instructions in our **genome** are **made up of DNA**.
 - **Within DNA is a unique chemical code** that guides an organism's growth, development and health.

- This **code is determined by the order of the four nucleotide bases** that make up DNA: adenine, thymine, cytosine, and guanine.
- **DNA has a twisted structure** in the shape of a **double helix**.
- **Single strands of DNA** are coiled up into structures called **chromosomes**.
- **Within chromosomes, sections of DNA are organised into genes**.
- **Genes control different characteristics** such as eye colour and height.
- **All living things have a unique genome**.
- There are **23 pairs of chromosomes in the human genome**.
- Between 1990 and 2003, **all twenty-three pairs were fully sequenced** through an international research undertaking known as the **Human Genome Project**.
- The **study and analysis of genomes** is called **genomics**.

Where is the Genome Found?

- In organisms known as **eukaryotes** (which includes humans, other mammals, plants and fungi), **most of the genome** is contained within a membrane-bound structure called the **nucleus**.
- **In humans and other complex multicellular organisms, a copy of the genome** is found **in nearly every cell** in the body.
- The **exception** to this is **mammalian red blood cells**, which **do not contain a genome as they do not have a nucleus or mitochondria**.
- Furthermore, human reproductive cells (**eggs and sperm**) each **contain half the DNA** from that person's genome, which then **combines to form a whole genome at fertilisation**.
- Organisms known as **Prokaryotes**, which contain no inner membranes, **store their genome in a region of the cytoplasm called the nucleoid**.

How long is a genome?

- The length of the genome **varies between species** and doesn't necessarily reflect the size of the organism from which it came.
- The **human genome is** approximately **3 billion base pairs** (3.2 to be exact) in length.
- While 3 billion is a big number, the rare **Japanese flower called Paris japonica** has a **genome size of roughly 150 billion nucleotides**, making it 50 times the size of the human genome.

Source: **TH**

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