Genome

The genome is the complete set of genetic material in an organism. It includes all of its DNA — or RNA in some viruses — and encompasses both the genes (coding regions) and the non-coding sequences that regulate or have structural functions.

Key Points

In humans, the genome consists of approximately 3 billion base pairs of DNA, organized into 23 pairs of chromosomes.

The human genome contains around 20,000–25,000 genes, which code for proteins.

Besides genes, the genome includes regulatory elements, repetitive sequences, non-coding RNAs, and more.

Genomes vary greatly in size and complexity across organisms — for example, some plants and amphibians have genomes much larger than humans.

Types of Genomic Studies: Genomics: The study of whole genomes, including mapping, sequencing, and analyzing functions and interactions.

Comparative genomics: Compares genomes between species to identify conserved elements and evolutionary changes.

Functional genomics: Investigates how genes and non-coding regions contribute to phenotypes.