

GENETICS

Basic concepts

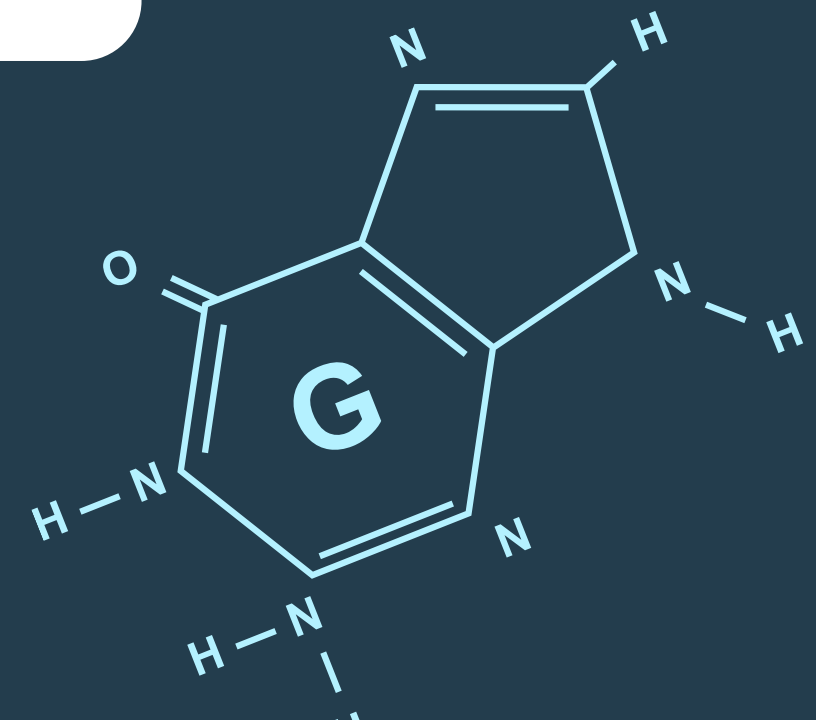
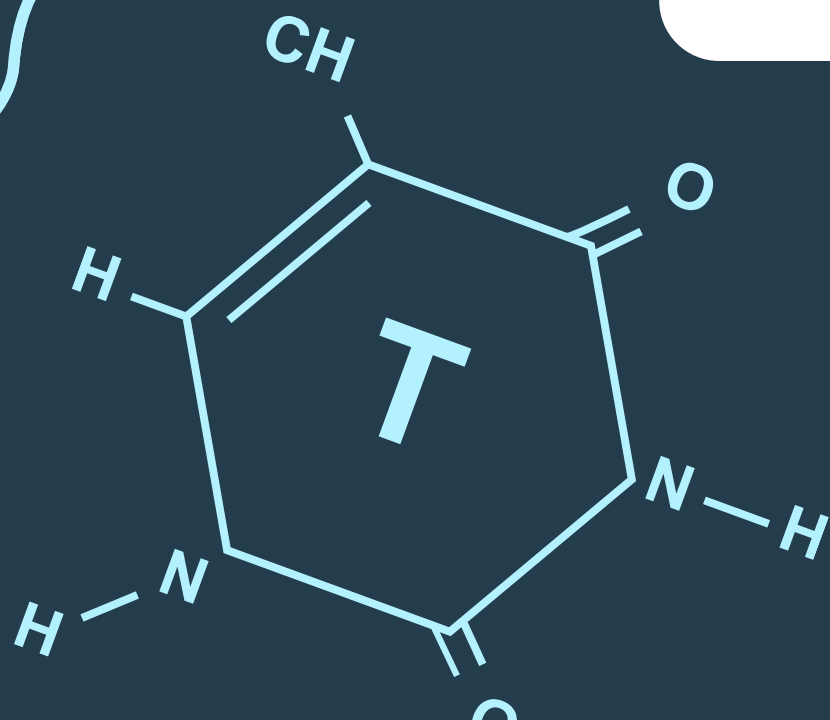
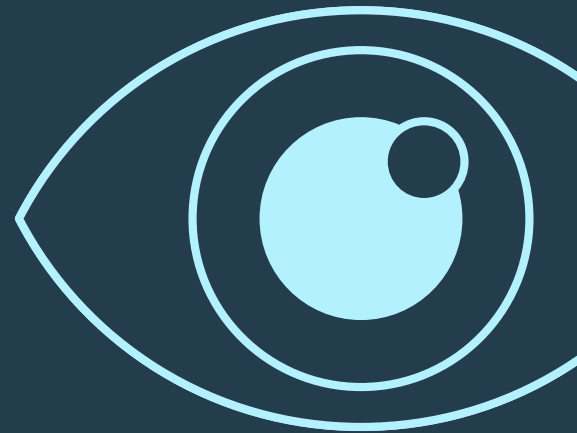
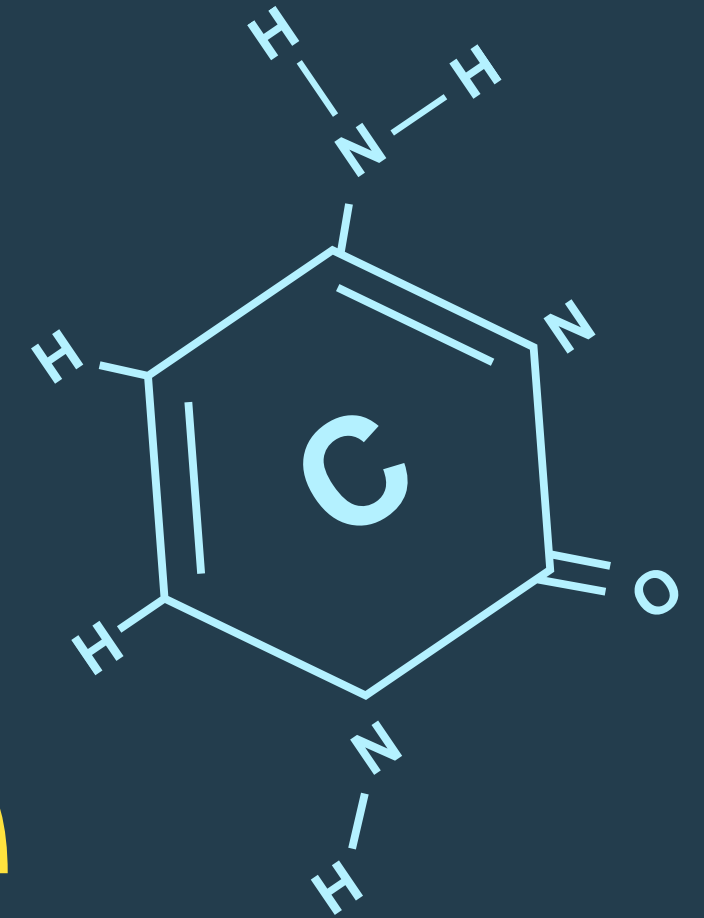
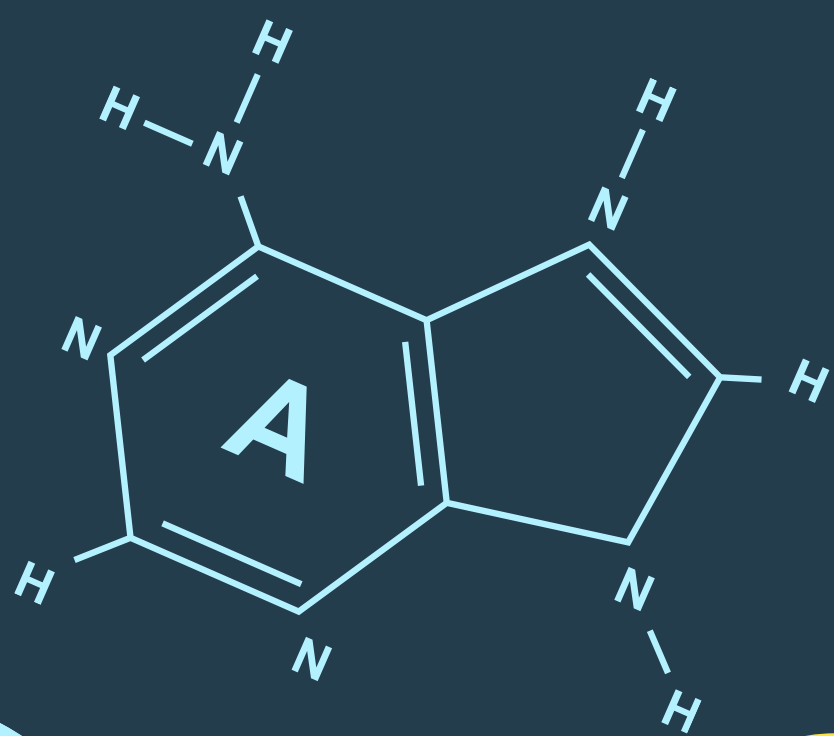


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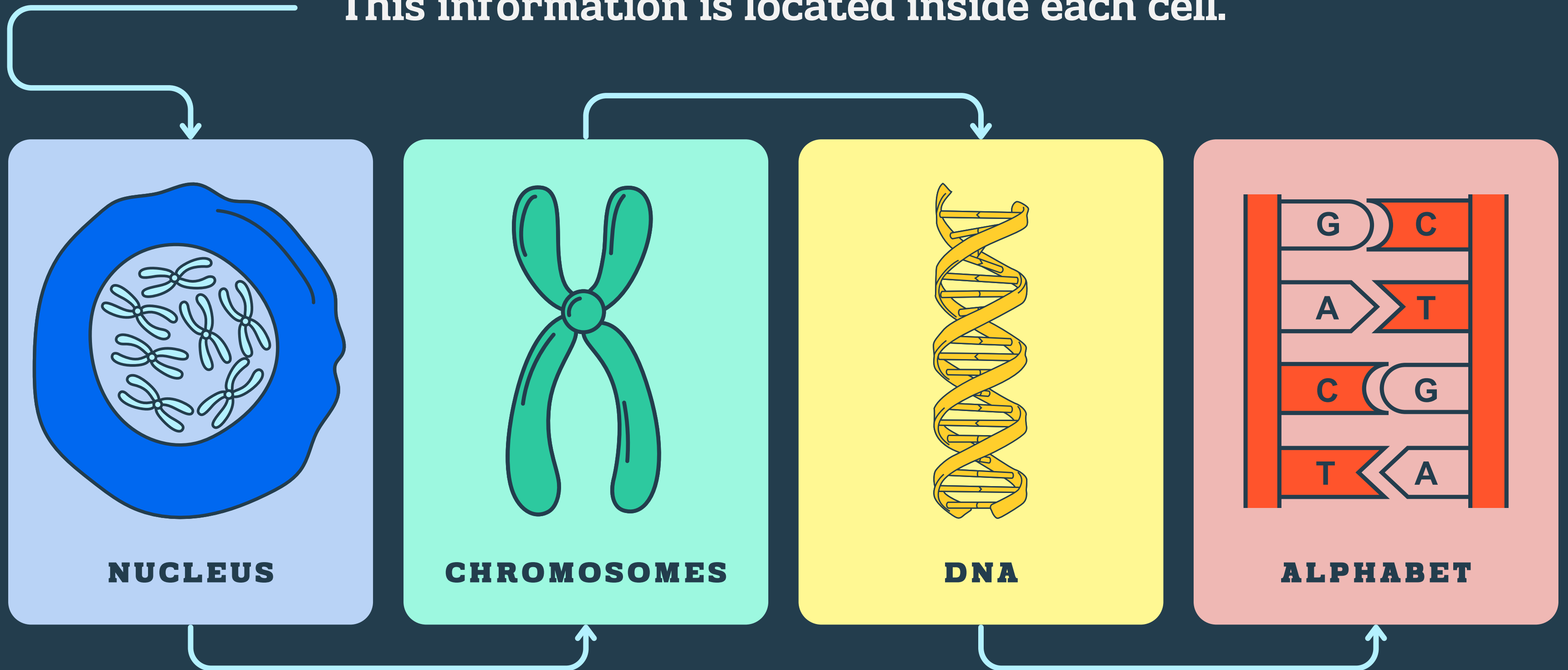
WHAT IS GENETICS?

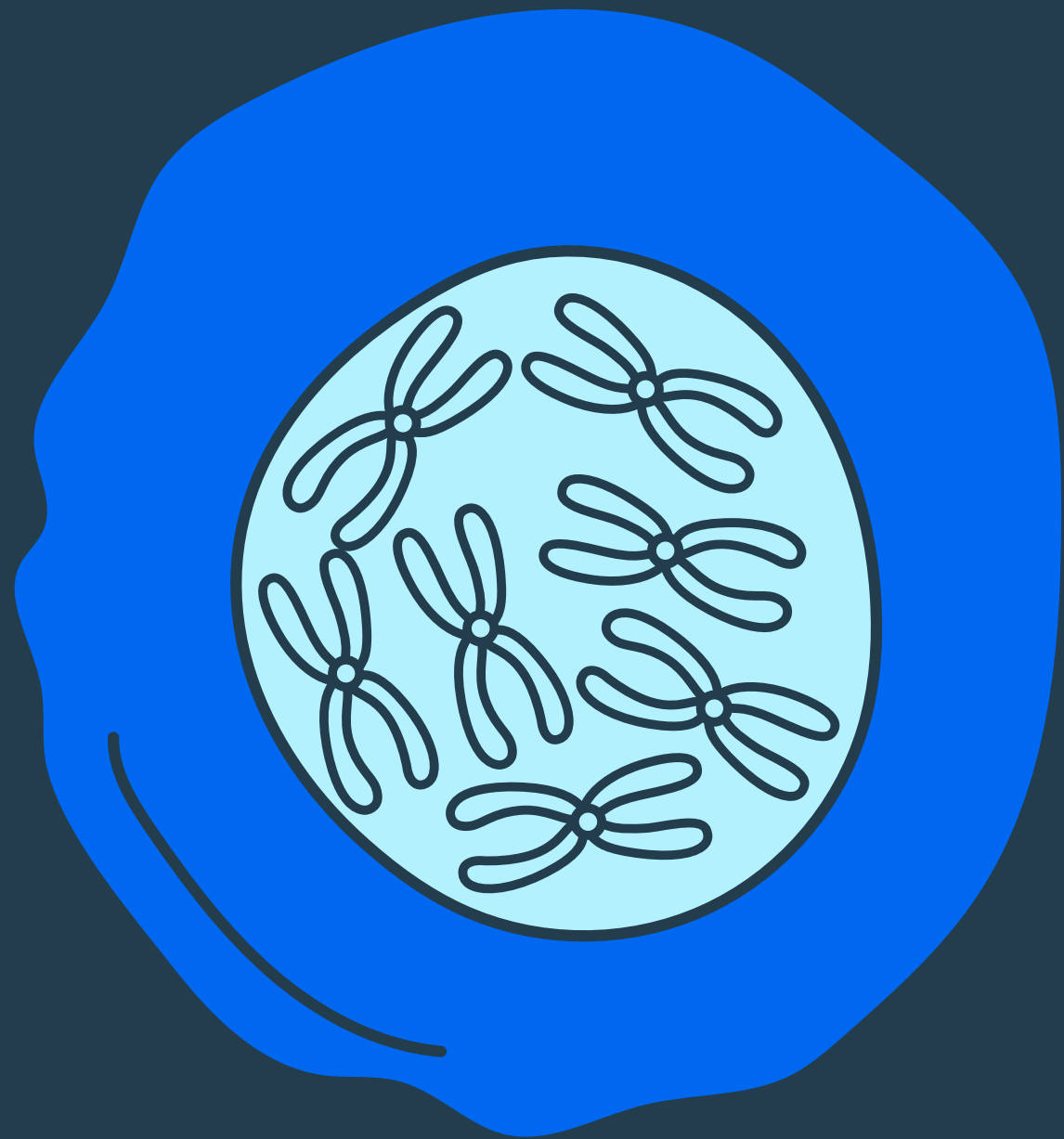
In the last century, the reason why some people inherit certain traits while others do not, has been subject of much research.

Surprisingly enough, the answer lies within the cell!

WHERE ARE THE GENES?

This information is located inside each cell.





NUCLEUS

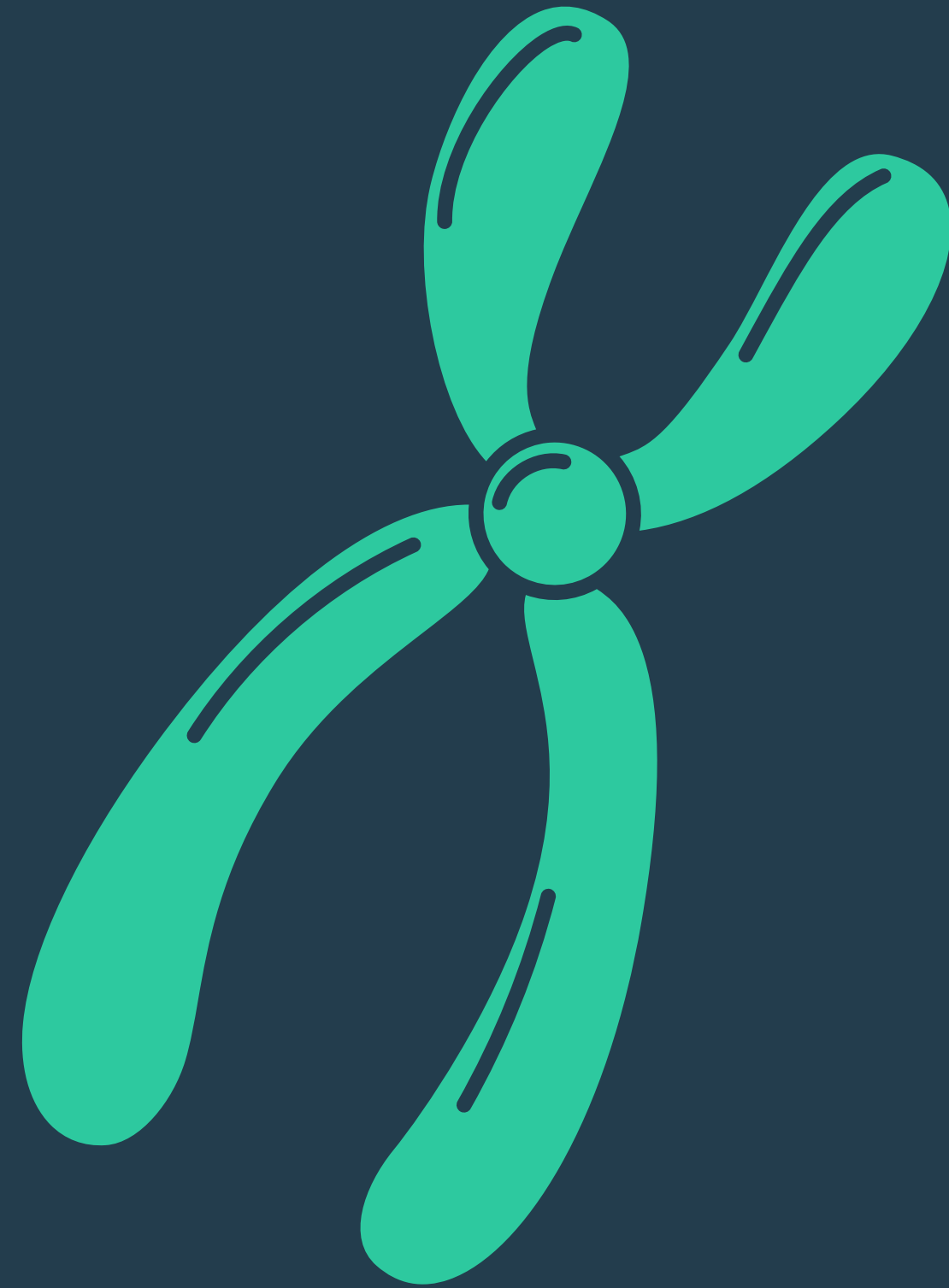
Under the microscope, the most evident part of the cell is the nucleus. It is also the most crucial part of it.

It is located in the center of the cell, surrounded by a membrane which keeps all the chromosomes inside.

CHROMOSOMES

Inside each cell, there are 23 pairs of chromosomes.

They are structures that are difficult to see under the microscope; however, they become more evident when the cell is divided.





DNA

In chemical terms, DNA is a polymer of nucleotides. In other words, a polynucleotide.

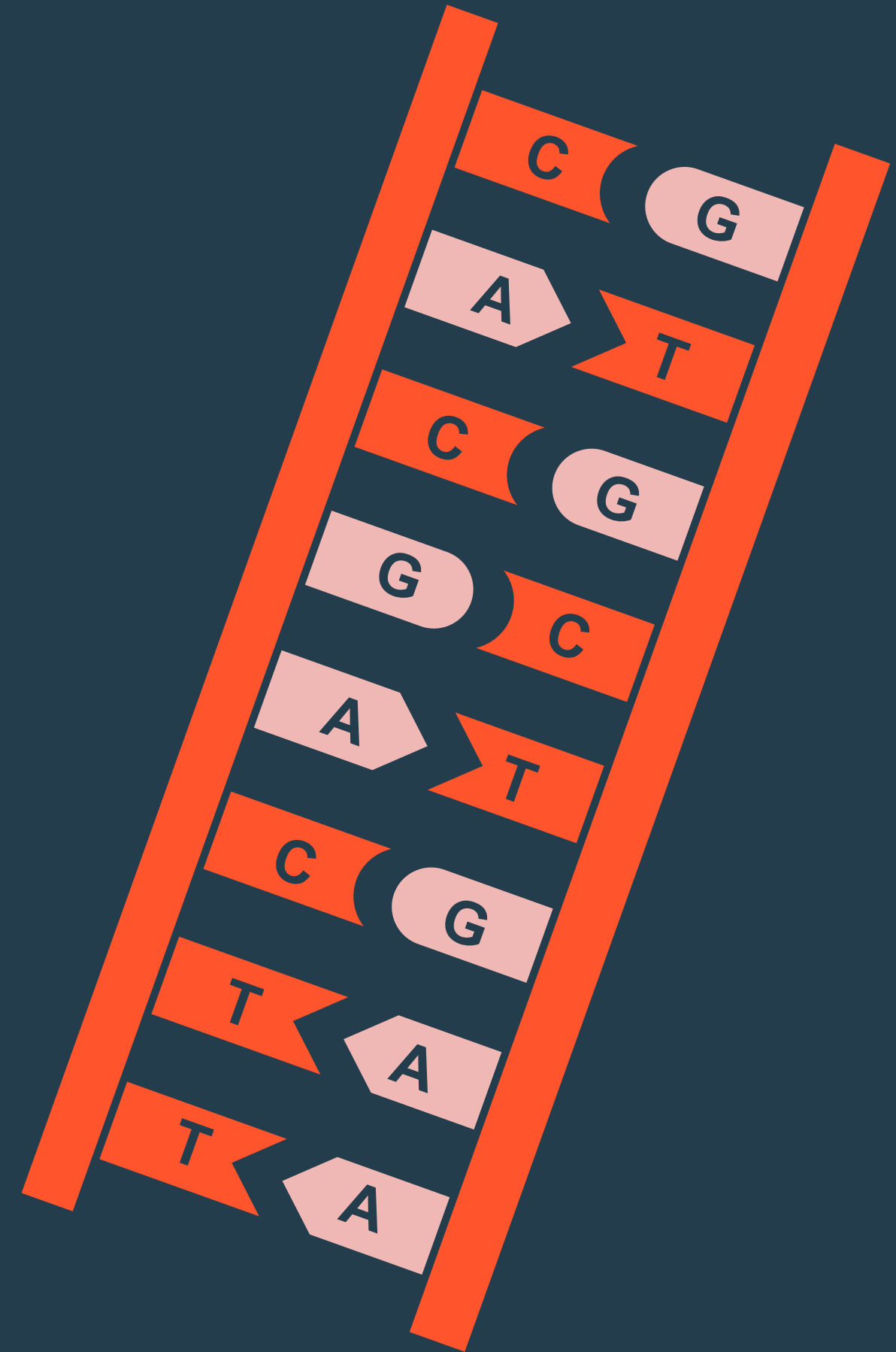
A polymer is a compound formed by many simple units connected to each other.

ALPHABET

The human genome
has only 4 letters:

Purine bases:
Adenine A and Guanine G

Pyrimidine bases:
Thymine T and Cytosine C

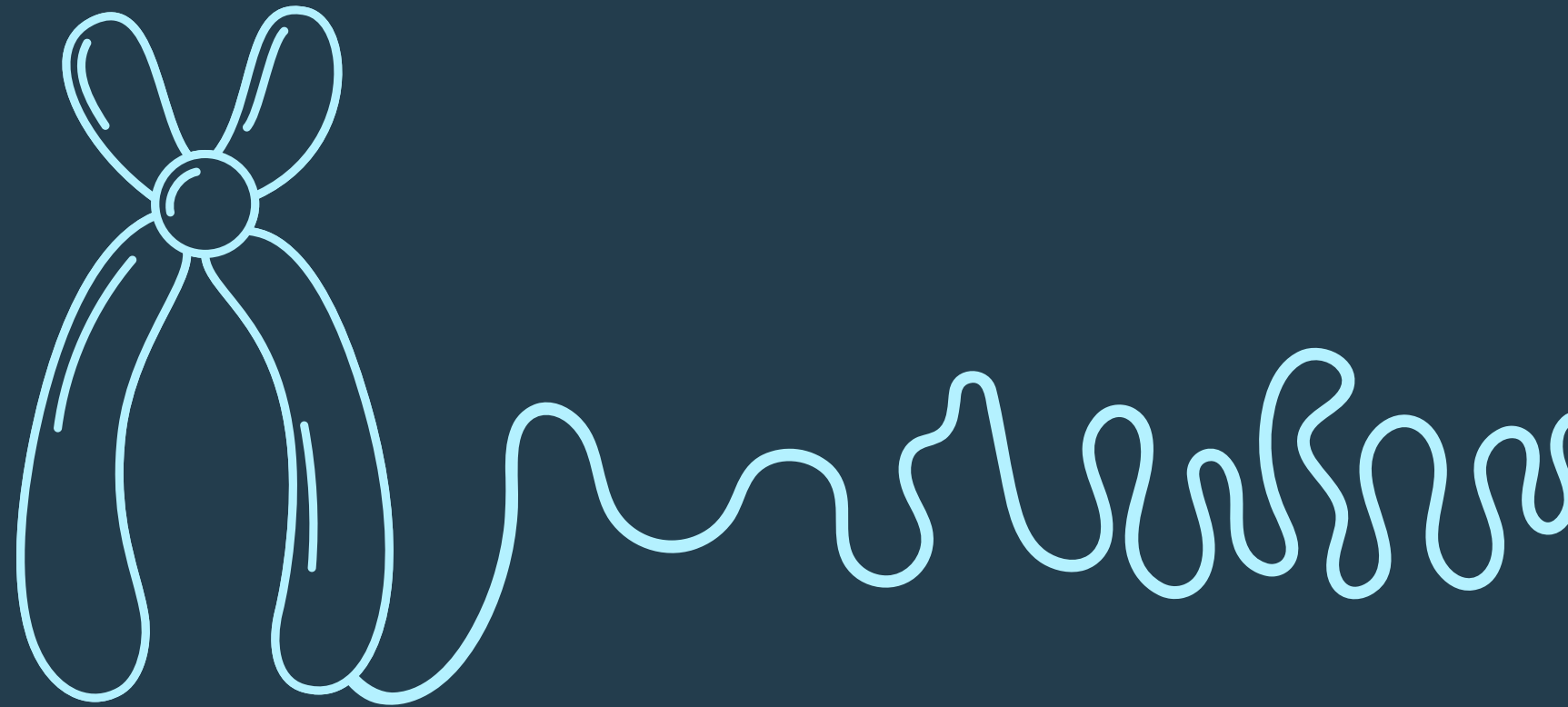


WHAT ARE GENES?

In humans, genes vary in size from a few hundred DNA bases to over 2 million bases.

Genes are composed of segments of DNA, the molecule that encodes genetic information in cells.

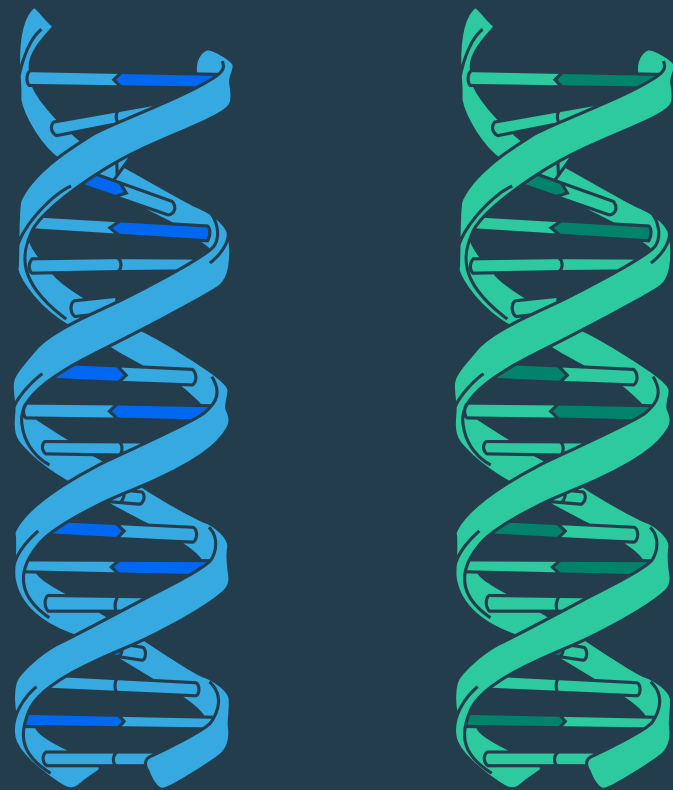
Some act as instructions to produce molecules called proteins, and many of them do not apparently encode.



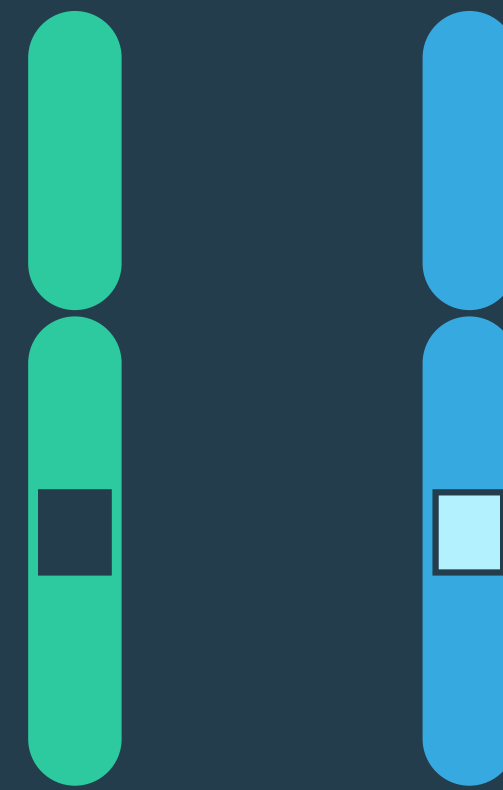
A gene is the fundamental physical and functional unit of heredity.

WHAT ARE ALLELES?

An allele is each of the two or more versions of a gene.



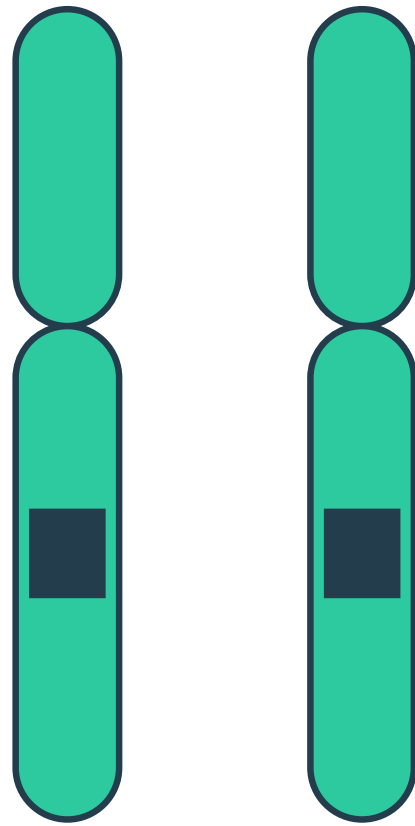
An individual inherits two alleles for each gene; one from the father and the other from the mother.



Alleles are located at the same position within homologous chromosomes.

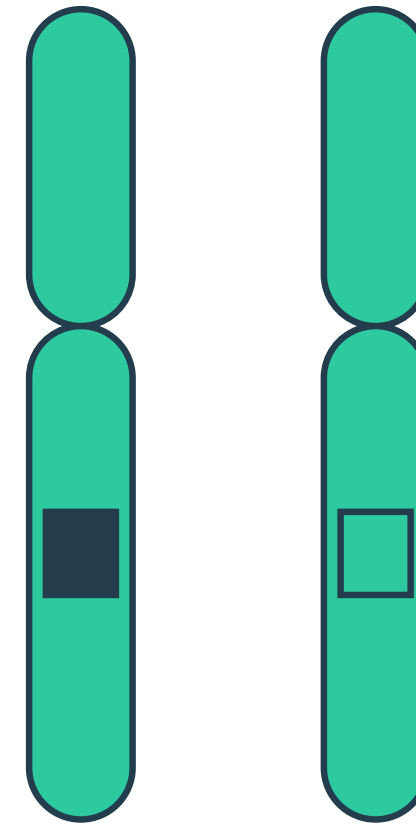
ALLELES

HOMOZYGOUS



If both alleles are identical, the individual is homozygous for this gene.

HETEROZYGOUS



If both alleles are different, the individual is heterozygous for this gene.

WHAT ARE PROBABILITY CHARTS?



These are diagrams designed and used to determine the probability that a product will have a certain genotype.

They allow for the observation of all possible combinations. Dominant alleles are represented with uppercase letters, and recessive alleles with lowercase letters.



Simplicity Clarity

The Medical Clarity Journal