

# Introductory Note

An effort was made to use as few technical terms as possible throughout the text. Moreover, when they are introduced in a sentence they are usually explained right away. *Cytology* is the study of the cell's structure and function, whereas *genetics* deals with hereditary transmission. In the 1960s biochemical methods combined with electron microscopy and radioisotope labelling, brought cytology and genetics to a common ground creating a new discipline: molecular cyto-genetics. This became, two decades later, generally known as molecular biology.

**CHROMOSOME** — The most important of all cell organelles due to being the main agent of genetic information. 1. In organisms that lack a nucleus in their cells (called prokaryotes), such as the bacteria, the chromosome is a circular DNA molecule containing the genetic information and is free in the cytoplasm. Part of its DNA is associated with a few proteins. 2. In organisms with cells having a nucleus (eukaryotes), the chromosome is one of the threadlike structures consisting of scaffolding proteins, basic proteins (histones) and DNA. This last macromolecule carries genetic information arranged in a linear sequence. In a eukaryotic cell besides the nucleus there are other organelles, such as mitochondria and chloroplasts, that have their own chromosomes consisting of circular DNA which also carry genetic information. They are usually of smaller dimensions. In all cases the genetic information is decided by the order of the bases along the DNA.

DNA transfers its genetic information by building a messenger RNA molecule complementary to its base sequence (transcription). This in turn leads to the synthesis of a protein with a specific configuration (translation). The situation may be reversed when RNA is transcribed into a DNA molecule, with the help of the enzyme reverse transcriptase, an event which occurs in some viruses.