

The MOLECULES of LIFE

Physical and Chemical Principles

The Molecules of Life deepens our understanding of how life functions by illuminating the physical principles underpinning many complex biological phenomena, including how nerves transmit signals, the actions of chaperones in protein folding, and how polymerases and ribosomes achieve high fidelity. The central theme is that the ways in which proteins, DNA, and RNA work together in a cell are connected intimately to the structures of these biological macromolecules. The structures, in turn, depend on interactions between the atoms in these molecules, and on the interplay between energy and entropy, which results in the remarkable ability of biological systems to self-assemble and control their own replication. By integrating fundamental concepts in thermodynamics and kinetics with an introduction to biological mechanism at the level of molecular structure, this textbook provides a physical and biochemical foundation for undergraduate students majoring in biology or health sciences.



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