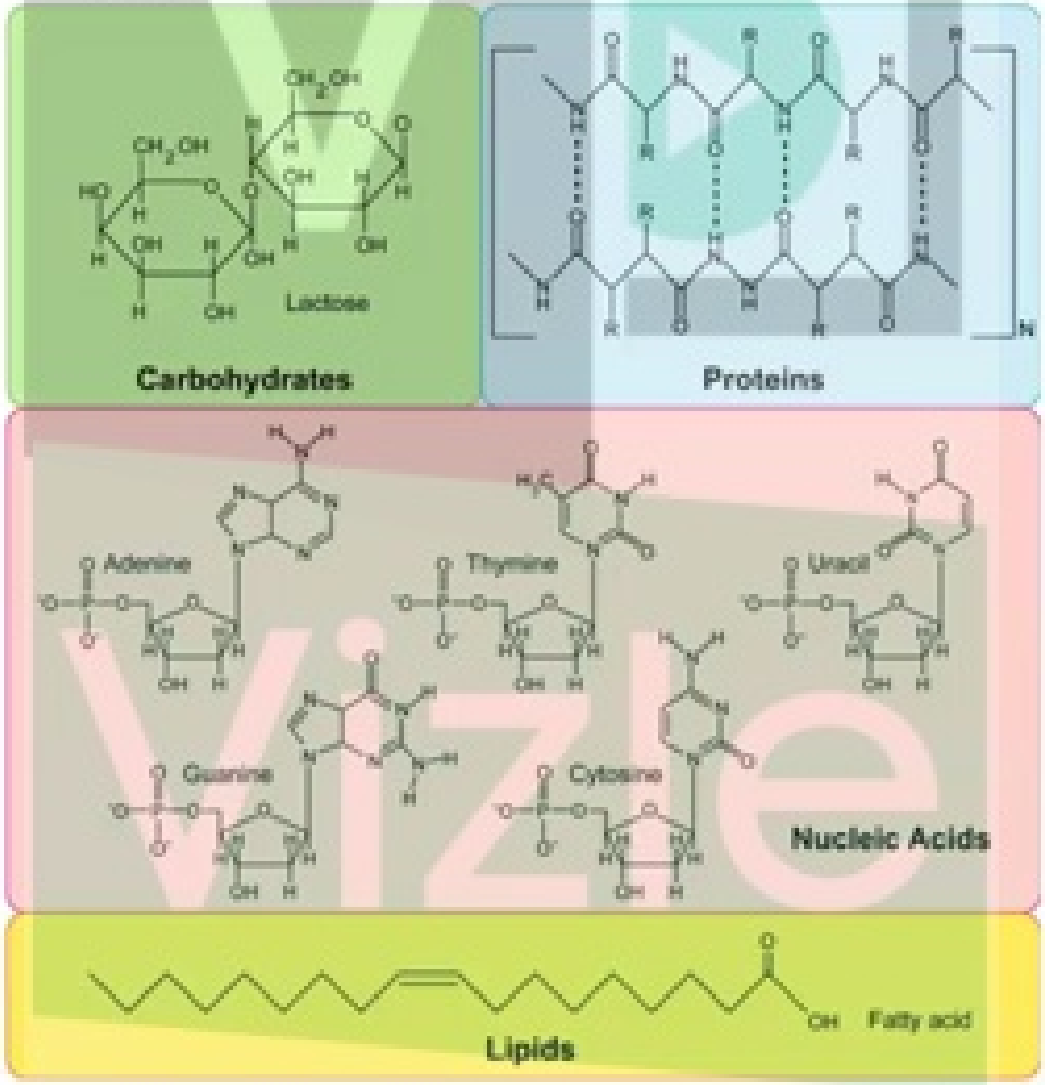
Chapter 5
The Structure and Function of Large Biological Molecules



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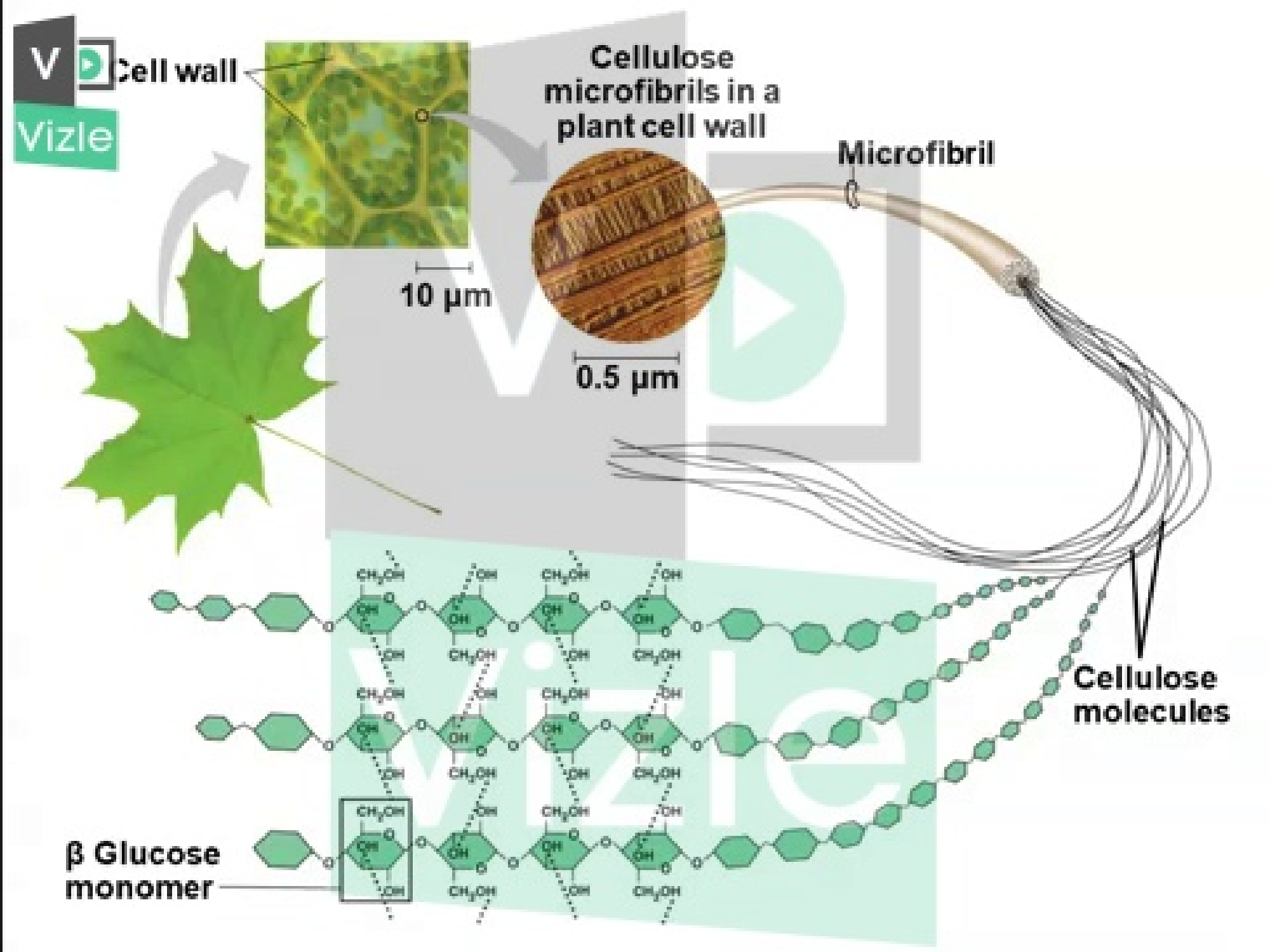
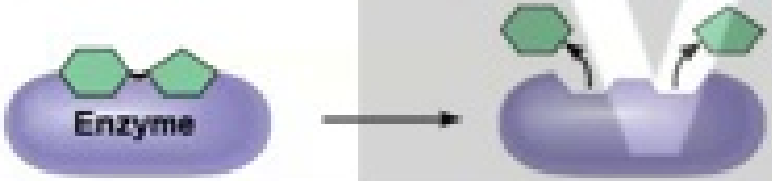

Cell wall
Cellulose microfibrils in a plant cell wall
Microfibril
10 µm
0.5 µm
Cellulose molecules
β Glucose monomer

Enzymatic proteins

Function: Selective acceleration of chemical reactions

Example: Digestive enzymes catalyze the hydrolysis of bonds in food molecules.



Defensive proteins

Function: Protection against disease

Example: Antibodies inactivate and help destroy viruses and bacteria.

Storage proteins

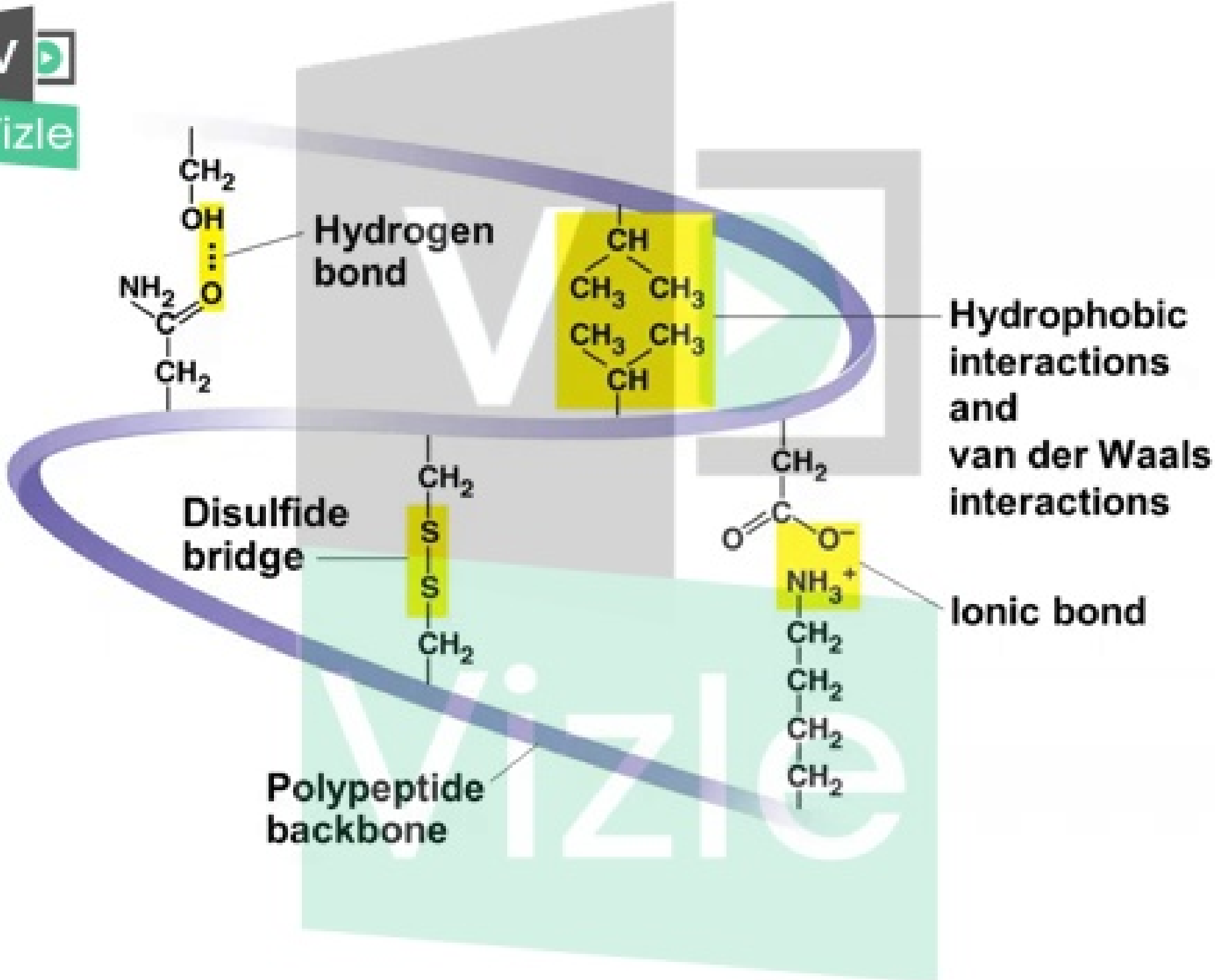
Function: Storage of amino acids

Examples: Casein, the protein of milk, is the major source of amino acids for baby mammals. Plants have storage proteins in their seeds. Ovalbumin is the protein of egg white, used as an amino acid source for the developing embryo.

Transport proteins

Function: Transport of substances

Examples: Hemoglobin, the iron-containing protein of vertebrate blood, transports oxygen from the lungs to other parts of the body. Other proteins transport molecules across cell membranes.


Hydrogen bond
Hydrophobic interactions and van der Waals interactions
Disulfide bridge
Ionic bond
Polypeptide backbone

Base Pairing

- The nitrogenous bases in DNA pair up (complementary base pairing) and form hydrogen bonds: adenine (A) with thymine (T), and
guanine (G) with cytosine (C)
- Complementary pairing can also occur between two RNA molecules or between parts of the same molecule
- In RNA, thymine is replaced by uracil (U) so A and U pair

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