



# Viruses

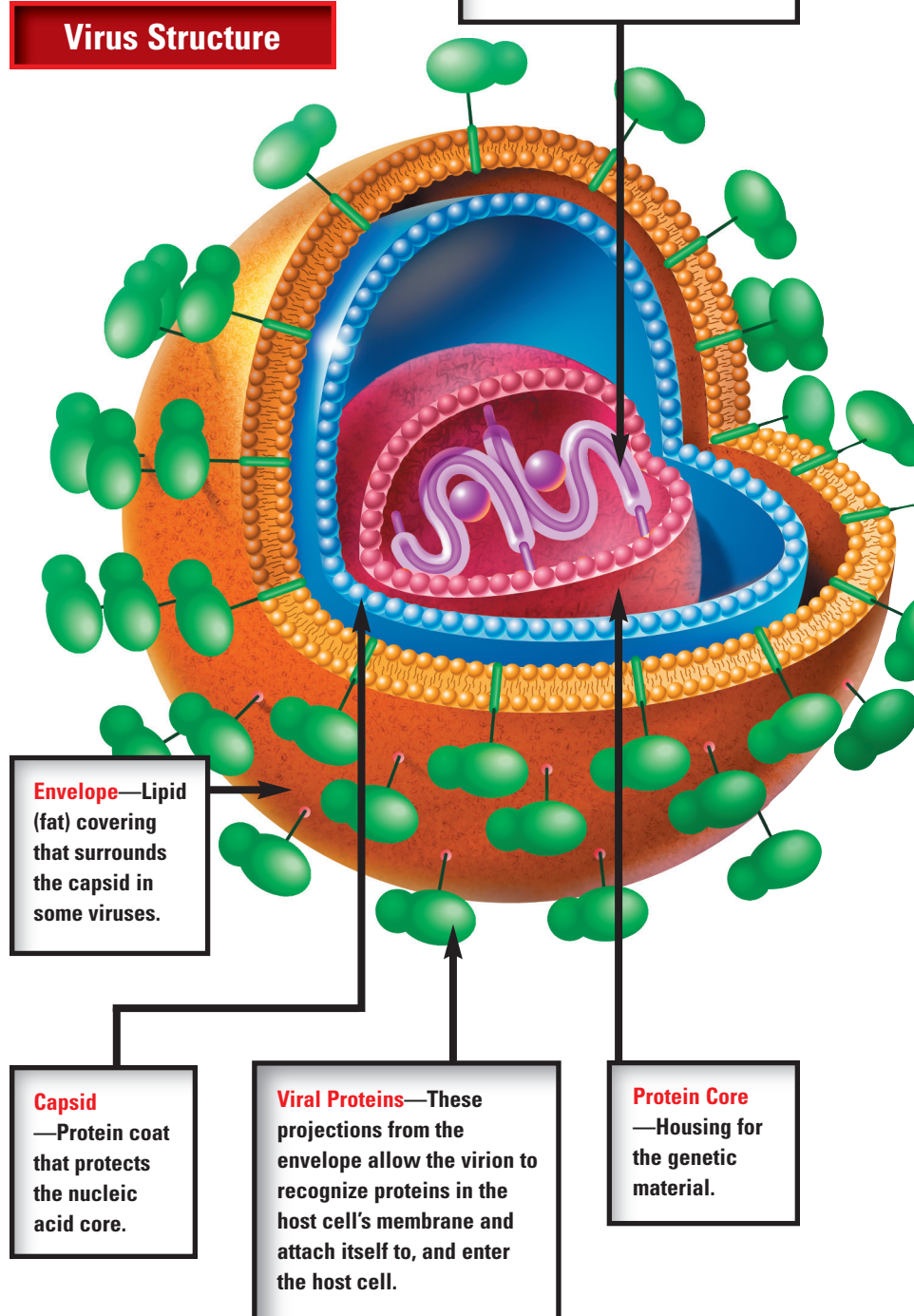
**F**eel healthy? Germ-free? Guess again... Invaders are slinking around your body right now, ready for a chance to take hold and hijack your cells. What will they do with your cells? They will use them to make copies of themselves. These tiny trespassers invade fungi, plants, animals—even bacteria. No living thing is free of them. They are viruses, and they spell big trouble in a tiny package.

If you've ever had a cold, the flu, or chicken pox, then viruses have been *replicating*—making copies of themselves—like crazy inside your body. They're invisible to the naked eye and even under most microscopes. What are they? They're not cells—they have no nucleus or energy-making capabilities as cells do. They can't reproduce by themselves. Viruses are parasites. Moochers. Freeloaders.

A single virus can either be called a virus or a virion. Virions vary greatly in size, shape, and complexity among the different kinds of viruses, but they share two basic structures: genetic material (DNA or RNA) and a coating. This drawing of a single HIV (Human Immunodeficiency Virus) getting ready to attack a human T4 helper cell shows those features plus additional ones that identify this particular virus.

**Nucleic Acids**—Genetic information for the virus—in the form of RNA. These are the blueprints that are injected into a host cell for creating new viruses. In other viruses, the genetic material is DNA.

## Virus Structure



# Cell Structure

**Ribosome (blue dots)**—Protein factory.  
Ribosomes are the sites of protein synthesis.

**Cytoplasm**—Jellylike material within the cell membrane that contains mostly water and nutrients and is in constant motion. The cytoplasm surrounds *organelles*, which have specific functions.

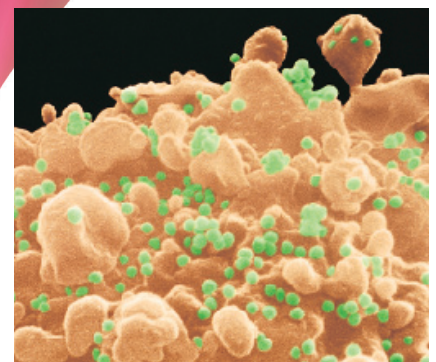
**Lysosome**—Tiny, spherical organelle containing enzymes that break down large molecules so the cell can use them.

**Nucleus**—Core of the cell, which contains the genetic material, DNA, often in the form of chromosomes.

**Mitochondrion (plural: Mitochondria)**—Respiration center that converts nutrients into energy for the cell.

**Endoplasmic Reticulum**—Membrane “highway” of folded sacs and tunnels through which materials travel through the cell. On its surface, proteins and new membranes are produced.

**Cell Membrane**—Outer boundary that separates the cell from other cells and its environment. The membrane allows certain molecules to pass through and keeps others out.



Inset shows a more accurate scale of viruses (green) to cell.