

Viruses: Size, Shape, and Reproduction

Both viruses and bacteria are microscopic, but viruses are much smaller than bacteria. Bacteria are single-celled living organisms. Viruses, however, are not considered to be living organisms. They are acellular (not cellular), meaning that they have no cell configuration. To put the size of viruses into perspective, a human egg cell is around 120 micrometers in diameter. Most viruses are between 20 and 400 nanometers. There are 1000 nanometers in a micrometer. We were not able to see viruses until the electron microscope was invented in the 1940s.

Viruses can be shaped like rods or like spheres. Viruses that infect bacteria, called bacteriophages, take a third shape. They have a geometric head and very thin, threadlike tail fibers. Regardless of their shape, all viruses contain either DNA or RNA and have an outer shell made of protein called a capsid.



Viruses are able to make animals and plants sick because when they enter a living system, they inject their DNA directly into their host's cells and begin to replicate. The more copies of itself the virus is able to make, the more of its hosts cells it takes over.

Viruses use either the lytic cycle or the lysogenic cycle to replicate. Some use only the lytic cycle. In the lytic cycle, the virus fastens itself to the host cell and inserts its DNA into the host cell. The viral DNA then starts to replicate and form proteins, using the cellular metabolism of the host. This produces more and more fully-formed viruses which lyse (break) the host cell and move to other cells to repeat the process. In the lysogenic cycle, the virus also fastens itself to the host cell and inserts its DNA, but the viral DNA gets incorporated into the DNA of the host cells. Then, as the host's cells replicate, the DNA of the virus is replicated at the same time. In this way, the virus' genetic material gets spread throughout the host without any of the host cells being broken.