



Topic: The Science of Viruses

TOOLS & RESOURCES

Project Firstline Video: [Episode 3: What is a virus?](#)

Project Firstline Video: [Episode 5: How do viruses make you sick?](#)

The Parts of a Virus:

<https://www.cdc.gov/infectioncontrol/projectfirstline/images/MultiMedia-SM-Twitter-ThePartsOfAVirus.jpg>

Virus Lock and Key:

<https://www.cdc.gov/infectioncontrol/projectfirstline/images/MultiMedia-SM-Twitter-VirusLockAndKey.jpg>

American Nurses Association Project Firstline Resources:

<https://www.nursingworld.org/practice-policy/project-firstline/training-courses/>

Chicago Department of Public Health:

<https://www.chicagohan.org/en/web/han/hai/pfl>



The Centers for Disease Control and Prevention Project Firstline initiative aims to provide infection prevention and control training for frontline healthcare workers by supporting their efforts to understand and confidently apply the principles necessary to protect themselves, their facility, and their community from infectious disease threats.

What is a virus?

A virus is a type of germ that can make you sick. There are many types of viruses that can make you sick and examples of some of those common viruses are listed below:

- 1) SARS-CoV-2 causes COVID-19
- 2) Influenza causes the flu
- 3) Varicella zoster causes chicken pox

Viruses are able to use living things, including people, to enter the cells in your body, make copies of themselves, spread within the body, and move from person to person. When the virus takes hold in the body, our immune systems revs up to fight off the body and causes fever, chills, cough and other symptoms. It is the activity of our immune system that makes us feel sick.

Parts of a Virus

Viruses are made up of a few different parts that include:

- 1) Genes: Genes contain all of the information a virus needs to make more virus copies. These genes are like an instruction booklet or a blueprint of the virus and need to be read by a cell in order to make more viruses.
- 2) Capsid: The capsid is the shell of a virus that protects the genes from getting damaged.
- 3) Proteins: Viruses have a variety of proteins. Some of the proteins work inside of the virus capsid to help the virus make more copies. Others have proteins that stick out from the capsid to help the virus move around inside of the body and from one person to another.

Understanding what a virus is and how they work can help ensure we implement infection control practices to prevent viruses from getting into our eyes, nose, mouth and the environment where they could make us sick.

How do viruses enter our body?

Our bodies are made up of billions of microscopic cells. On the outside of our body's cells there are tiny parts that stick out of each cell that are made of proteins. They proteins act like a lock on a door, and if you have the right "key" for the "lock" thank you can get inside of the cell. Some viruses have proteins on the outside of their capsids that work like a false key and will fit into the lock of our body's cells. The virus' false key is enough that a virus can invade our body's cell and hijack the cell's machinery to make more copies of itself. As the virus makes copies, they break out of the infected cells in our body and move on to infect new cells. In many cases, the cell that's been hijacked and infected is destroyed in the process.

Please reach out to InfectionPrevention@team-ihh.org if you have any questions or comments.