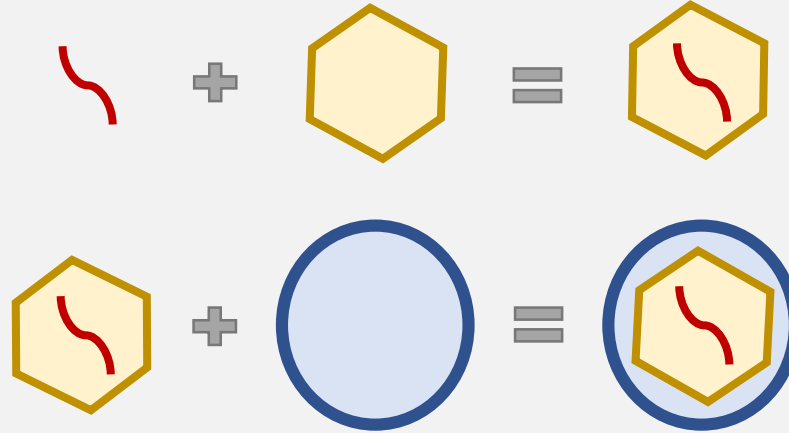


# Why are viruses with an envelope less stable on surfaces and more susceptible to disinfectants than viruses without an envelope?

- Both enveloped and non-enveloped viruses have **RNA or DNA** stored within a **Capsid** made of self-assembled structural proteins
- Enveloped viruses have an additional layer around the capsid, called the **Envelope**, made of a lipid bilayer acquired from the infected host



## Capsid

- Structural proteins are arranged to increase surface area
- Stable enough to survive the GI tract, but sensitive to heat

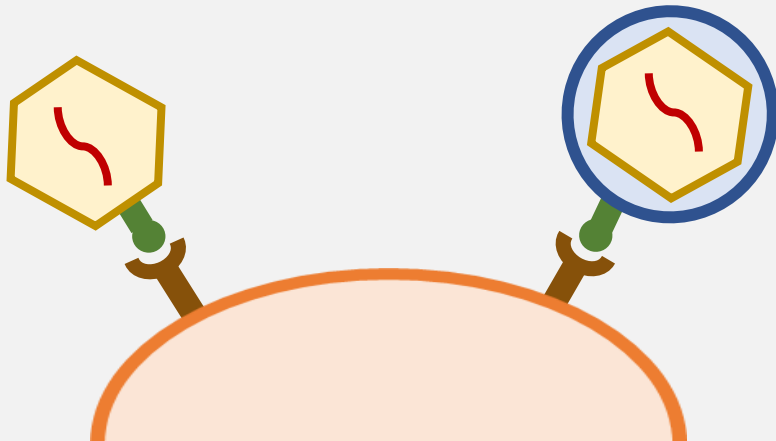
## Envelope

- Phospholipids acquired from the host aid in evasion of the immune system
- Sensitive to chemical and physical treatments like ethanol, bleach, heat, and UV

## Examples

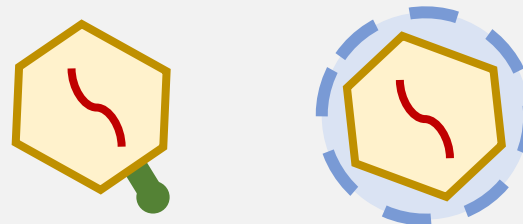
- Influenza virus and SARS-CoV-2 are enveloped viruses
- Norovirus and hepatitis A virus are non-enveloped viruses

- Host cells have **Receptor Molecules** on their **Cell Membranes** which bind to signaling molecules
- Viruses use **fusion proteins (FPs)** to bind to the **Receptor Molecules**
  - Non-enveloped viruses have **FPs** on their **Capsids**
  - Enveloped viruses have **FPs** on their **Envelopes**



**Location, Location, Location...**  
**enveloped viruses are not infectious after disinfection treatments because their fusion proteins were located on the damaged envelope**

- **Envelopes** can undergo conformational changes, disintegration, or other injuries resulting in the loss of **FPs** and ability to infect
- **Capsids** are more resistant and remain intact



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- Non-enveloped viruses retain the **FPs** on their **Capsid** and are still infectious
- Enveloped viruses lose the **FPs** on their **Envelope**, cannot bind to **Receptor Molecules**, and are no longer infectious

