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.

- 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.

- 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.

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

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

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

- 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.

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

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