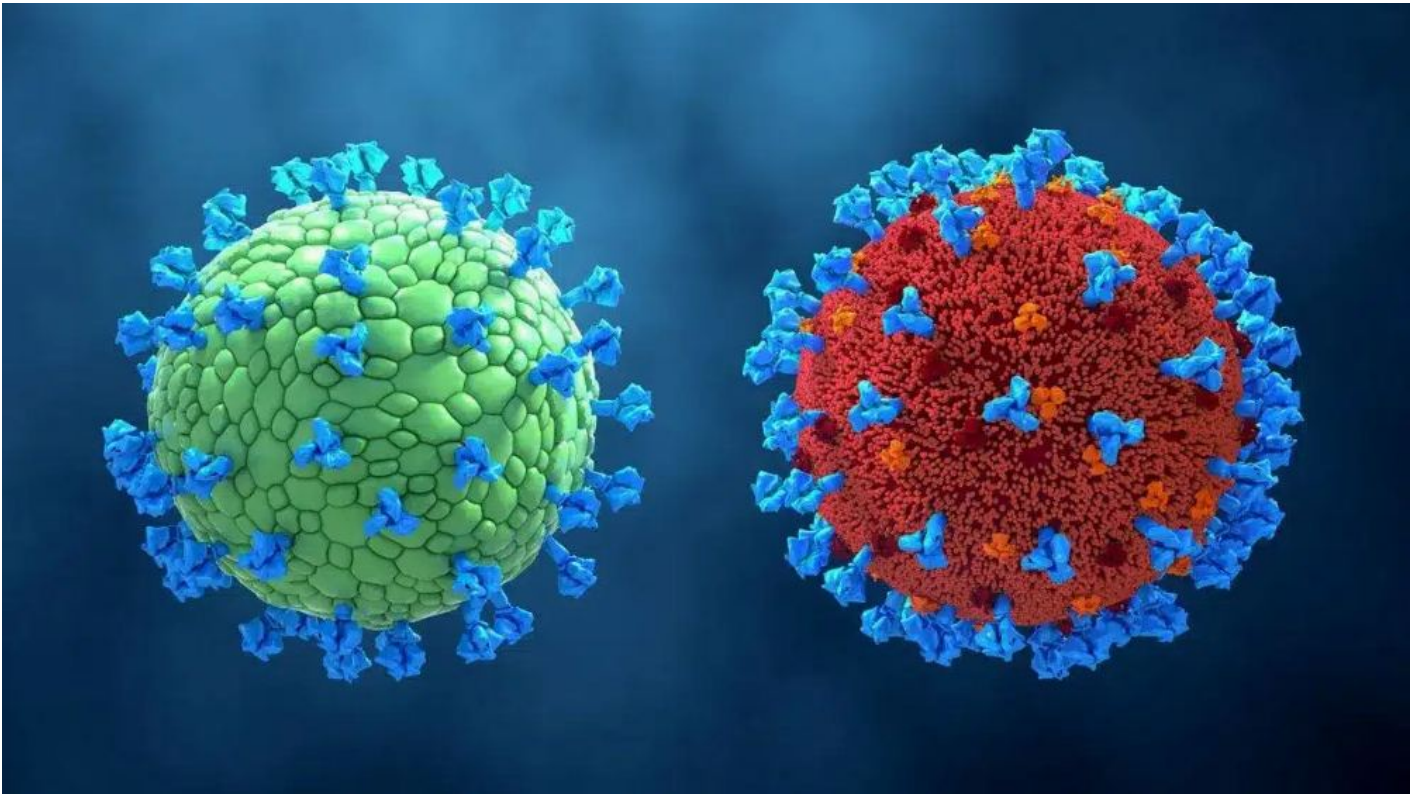


What are Virus-like particles (VLPs)?

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About Virus-like Particles (VLPs):

- VLPs are **molecules that resemble viruses** but **lack infectivity** because of the **absence of viral genetic material**.
- They are a very **effective way of creating vaccines** against diseases such as human papillomavirus (HPV), **hepatitis B**, **malaria**, and more.
- As they are very similar to real viral molecules, **introducing a VLP** into the body will **trigger an immune response**, but a person **will not experience any symptoms** of the virus they are being vaccinated against.
- Once the body has had an immune response to the VLP, it will recognize the virus and **prevent infection in the future, giving people immunity** to that particular virus.
- **Structure:**
 - VLPs are **very small**, with a particle radius of approximately 20 to 200 nm. This means that they can **easily enter the lymph nodes, where the immune system is activated** in the case of an infection.
 - A VLP **consists of** one or more **structural proteins** that can be **arranged in multiple layers**.

- They can also contain an **outer lipid envelope**, which is the **outermost layer** that covers a large number of different viruses. This outer layer **protects the genetic material** inside the virus particle.
- Creating a **VLP vaccine can use bacterial, yeast, insect, or mammalian cells**.
- **When used as a vaccine**, VLPs cause a robust immunogenic response due to their **high-density display of epitopes** and the **capacity to present multiple proteins** to the immune system.
- Most recently, VLPs have been **employed as nanomachines to deliver** pharmaceutically active products to specific sites and **into specific cells in the body**.

Key Facts about Nipah Virus:

- **Nipah virus (NiV)** is a **zoonotic virus** (it is transmitted from animals to humans) and can also be transmitted through contaminated food **or directly between people**.
- In infected people, it causes a range of illnesses, from **asymptomatic** (subclinical) **infection to acute respiratory illness** and **fatal encephalitis**.
- The **virus** can also **cause severe disease in animals**, such as pigs, resulting in significant economic losses for farmers.
- It first broke out in Malaysia and Singapore in 1998 and 1999.
- **Treatment:**
 - There are currently **no drugs or vaccines** specific for Nipah virus infection.
 - **Intensive supportive care is recommended** to treat severe respiratory and neurologic complications.

Q1: What is a Virus?

A virus is an infectious microbe consisting of a segment of nucleic acid (either DNA or RNA) surrounded by a protein coat. A virus cannot replicate alone; instead, it must infect cells and use components of the host cell to make copies of itself. Often, a virus ends up killing the host cell in the process, causing damage to the host organism. Well-known examples of viruses causing human disease include AIDS, COVID-19, measles and smallpox.

Source: [New method to generate virus-like particles, to help with developing antibodies against Nipah](#)

Source: <https://vajiramandravi.com/current-affairs/virus-like-particles-vlps/>

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